

FINAL REPORT

Study Title

Oral (Diet) Repeated Dose 90-Day Toxicity Study of Malathion Technical in Rats

Test Guideline

OECD guidelines for the testing of chemicals, No. 408 (1998).

U.S. EPA. Health effects test guidelines, OPPTS 870.3100 (August 1998).

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Study Completed On

12 March 2012
(Final Report)

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Laboratory Project ID

Charles River Laboratories Preclinical Services Protocol Number: TQC00066

STATEMENT OF CONFIDENTIALITY

This report contains confidential and proprietary information of Cheminova A/S which must not be disclosed to anyone except the employees of this company or to persons authorized by law or judicial judgment without the expressed and written approval of Cheminova A/S.

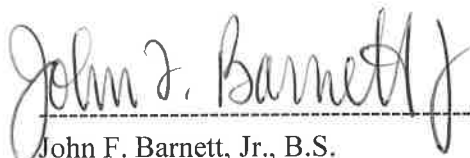
GOOD LABORATORY PRACTICE COMPLIANCE STATEMENT

This study was conducted in compliance with the Good Laboratory Practice (GLP) regulations of the U.S. Environmental Protection Agency^a and the Organisation for Economic Co-operation and Development^b, with the following exceptions:

- The ophthalmological evaluations were conducted under U.S. EPA Good Laboratory Practice (GLP) Standards^a only. This exception did not adversely impact the study because an acceptable method was used to perform the evaluations.
- The Benchmark Dose Modeling analysis of cholinesterase data was not designated in the protocol, nor was the Principal Investigator specified in the protocol. The Test Site's quality control procedures, and not Good Laboratory Practice regulations, were applied to these statistical analyses. This exception did not adversely impact the study because this analysis was developed by the Environmental Protection Agency to assist in the analysis of the cholinesterase data.

This final report accurately reflects the raw data obtained during the performance of the study. Deviations from the protocol and standard operating procedures of the Testing Facility are documented in this report and/or the raw data. Those deviations that occurred did not affect the quality or integrity of the study.

Study Director:



John F. Barnett, Jr., B.S.
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12 Mar 2012

Date

-
- a. Federal Insecticide, Fungicide and Rodenticide Act/Toxic Substances Control Act (FIFRA/TSCA); Good laboratory practice standards; Final Rule 40 C.F.R Part 160/792; August 17, 1989. U.S. Environmental Protection Agency.
- b. OECD Principles of good laboratory practices, [C(97)186/Final] (1998); Environmental Health and Safety Division. OECD Environment Directorate.

QUALITY ASSURANCE STATEMENT

Protocol: TQC00066

This study has been inspected by the QAU to assure conformance with the GLP regulations US Environmental Protection Agency, Good Laboratory Practice Regulations, Final Rule, 40 CFR Part 160/792 and Organisation for Economic Co-operation and Development (1998), The Revised OECD Principles of Good Laboratory Practices [C(97)186/Final]. Reports were submitted in accordance with SOPs as follows.

QAU INSPECTION DATES

		<u>Dates Findings Submitted to:</u>	
		Study Director	Management
Dates of Inspection	Phase(s) Inspected	Study Director	Management
11 Jan 2011	Protocol	11 Jan 2011	11 Jan 2011
24 Feb 2011	Amendment 1	24 Feb 2011	24 Feb 2011
15 Apr 2011	Amendment 2	15 Apr 2011	15 Apr 2011
18 Apr 2011	Amendment 3	18 Apr 2011	18 Apr 2011
02 Jun 2011 06 Jun 2011	Amendment 4	02 Jun 2011 06 Jun 2011	02 Jun 2011 06 Jun 2011
10 Feb 2011	Test Substance Diet Preparation	10 Feb 2011	10 Feb 2011
08 Mar 2011	Test Substance Administration	09 Mar 2011	09 Mar 2011
19 Apr 2011	Blood Collection	21 Apr 2011	21 Apr 2011
19 Apr 2011	Necropsy	21 Apr 2011	21 Apr 2011
26 Apr 2011	Cholinesterase Processing/Analysis	03 May 2011	03 May 2011
22 Jun 2011	Formulation Data	22 Jun 2011	22 Jun 2011
13, 16-17 May 2011 22 Jun 2011	In-Life Data	17 May 2011 22 Jun 2011	17 May 2011 22 Jun 2011
03, 14 Jun 2011	Necropsy Data	16 Jun 2011	16 Jun 2011

		<u>Dates Findings Submitted to:</u>	
Dates of Inspection	Phase(s) Inspected	Study Director	Study Director Management
08, 10-11 Jul 2011	Cholinesterase Data	12 Jul 2011	12 Jul 2011
13-14 Jun 2011	Organ Weight Report Tables	14 Jun 2011	14 Jun 2011
11, 20-22, 23-24 Jul 2011	Report Tables	25 Jul 2011	25 Jul 2011
19 Jul 2011 25, 25 Jul 2011	Methods	19 Jul 2011 26 Jul 2011	19 Jul 2011 26 Jul 2011
24, 25 Jul 2011	Results	25 Jul 2011	25 Jul 2011
28, 29 Jul 2011	Summary	29 Jul 2011	29 Jul 2011
26 Jan 2012	Revised Report	27 Jan 2012	27 Jan 2012
06, 07 Mar 2012	Final Report	07 Mar 2012	07 Mar 2012

In addition to the above-mentioned inspections, process-based and/or routine facility inspections were also conducted during the course of this study. Inspection findings, if any, specific to this study were reported by the QAU to the Study Director and Management and listed as a phase inspected on this QA Statement.

QA statements were provided by the following Test Sites and were reviewed:

Test Site(s)	Phase	QA Statement Location
Charles River Laboratories, Preclinical Services, Ohio	Clinical Pathology	Appendix 7
Charles River Laboratories, Pathology Associates, Illinois	Histopathology	Appendix 8
Charles River Laboratories, Preclinical Services, Nevada	Bone Marrow Analysis	Appendix 9

The Final Report has been reviewed to assure that it accurately describes the materials and methods, and that the reported results accurately reflect the raw data.

Marielena Brennan

12 Mar 2012

Marielena Brennan, BS, RQAP-GLP
Senior Quality Assurance Auditor
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Date

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1. ABSTRACT^a

1.1. Methods

The purpose of this study was to provide information on possible adverse effects on Crl:CD(SD) rats resulting from repeated exposure to Malathion technical over an extended period of time covering postweaning maturation and growth well into adulthood. The study was designed to provide information on toxicity, indicate target organs and the possibility of accumulation, and was also designed to provide an estimate of a no-observed-adverse-effect level (NOAEL) of exposure that could be used for establishing safety criteria for human exposure.

One hundred twenty five male rats and 125 female rats were assigned to five dosage groups (10 rats/sex/dosage group assigned to the main study and 15 rats/sex/dosage group were assigned to the cholinesterase subset). Diets (PMI[®] Certified Rodent Diet[®] #5002) were prepared bi-weekly to administer Malathion technical at concentrations corresponding to target doses of 0 (Carrier Control) ppm, 100 ppm, 500 ppm, 5000 ppm, and 10000 ppm (Groups I through V, respectively). A constant concentration of the test substance in the diet was offered to the rats, and the mg/kg/day dosages consumed were calculated and presented for periods corresponding to body weight and feed consumption observations. Prepared diets were available *ad libitum* beginning on day 1 of study (DS 1) for 90 consecutive days.

Criteria for evaluation included viability, clinical observations, weekly detailed clinical observations, body weights and body weight gains, feed consumption values, ophthalmological examinations, necropsy observations, organ weights, clinical pathology, cholinesterase evaluation, histopathology, and bone marrow analysis.

Rats found dead or euthanized before scheduled termination were examined for the cause of death or condition as soon as possible after the observation was made. In addition, the nasal passages, the nasal cavity and neck with associated organs and tissues were examined. Specific organs were weighed, and the gross lesions were processed histologically, and examined microscopically.

On DS 91, rats assigned to the main study were anesthetized under the isoflurane/oxygen, and following blood collection from the inferior vena cava, were euthanized by an injection of sodium pentobarbital into the inferior vena cava. Blood was collected and processed for clinical pathology evaluation. The rats were necropsied and examined for gross lesions. Specific organs were weighed, and a full set of tissues was processed histologically, and examined microscopically from all rats in the 0 (Carrier Control) and 10000 ppm (Groups I and V, respectively) exposure groups, and on the nasal cavity and turbinates from all exposure groups (Groups I through V).

-
- a. Detailed descriptions of all procedures used in the conduct of this study are provided in the appropriate sections of this report and in the attached protocol (Appendix 1, Protocol and Protocol Amendments). Deviations from the Protocol and the Standard Operating Procedures of the Testing Facility are available in Appendix 2 (Deviations from the Protocol and the Standard Operating Procedures of the Testing Facility) and/or in the raw data.

On DS 91, rats assigned to the cholinesterase subset were anesthetized under the isoflurane/oxygen and following blood collection from the vena cava, were euthanized by an injection of sodium pentobarbital into the inferior vena cava. Red blood cell and brain cholinesterase levels were evaluated at the Testing Facility. All rats were examined for gross lesions, and a gross necropsy of the thoracic, abdominal and pelvic viscera was performed. Carcasses were discarded without further evaluation.

1.2. Results

1.2.1. Main Study Subset

Consumed dosages for the rats averaged over the exposure period (calculated DSs 1 to 85)^a are tabulated below. The highest weekly consumed dosages occurred during the first two weeks of exposure.

Text Table 1
Mean Consumed Dosages (mg/kg bw/day)

Concentration in Diet (ppm)	Male Rats	Female Rats
100	7.2	7.5
500	35.0	35.9
5000	353.6	363.1
10000	733.8	719.0

There were no test substance-related adverse clinical signs or detailed clinical observations observed in the male and female rats during the 90-day exposure period. There were also no test substance-related adverse observations apparent during the ophthalmologic examinations conducted in the male and female rats.

Mean body weights were marginally reduced in the male rats at 5000 and 10000 ppm and the female rats at 10000 ppm during the exposure period. Statistical significance was only observed on DS 8 in the male rats at 10000 ppm. Body weight gains were statistically significantly decreased in the male rats at 5000 and 10000 ppm and the female rats at 10000 ppm during the entire exposure period and at a few intervals during the exposure period.

At 10000 ppm, absolute feed consumption values were statistically significantly reduced in both the male and female rats during the first week of exposure.

Relative feed consumption values were statistically significantly reduced in the male rats during the first week of exposure. The relative feed consumption values were also statistically significantly increased in the male rats at 10000 ppm on DSs 8 to 15 and 15 to 22. These statistically significant increases were related to the decrease in body weight and generally comparable feed consumption values during these intervals.

-
- a. The rats were exposed to the test substance for at least a 90-day period; however, because of fasting for blood collection the terminal body weight value recorded on the final day of the study could not be used in the calculation of the mean consumed dosage. Therefore, the last non-fasted body weight value that correlated with a feed consumption value was recorded on DS 85, so the mean consumed dosage were calculated using these values.

In the male rats at 5000 and 10000 ppm and the female rats at 10000 ppm, feed efficiency was statistically significantly decreased during the exposure period. There were additional instances of reduced or statistically significantly reduced feed efficiency values in the male rats at 5000 and 10000 ppm and the female rats at 10000 ppm during the first week of exposure and a few additional timepoints during the exposure period.

There was also an increase in the gamma-glutamyltransferase in the male rats at 10000 ppm. There were no additional changes in clinical chemistry that were test substance-related.

There were no test substance-related adverse gross lesions observed at necropsy or hematology changes that were attributed to exposure to the test substance.

The relative (% body weight) weight of the liver was statistically significantly increased in the male rats at 5000 ppm. In the male rats at 10000 ppm, the absolute and relative (% body weight and % brain weight) weight of the liver and the paired kidneys was statistically significantly increased. Relative to body weight, there was also a statistically significant increase in the liver and paired kidneys in the female rats at 10000 ppm. There were no microscopic findings in the liver or kidney that explained these changes in organ weights.

Microscopic findings related to exposure to the test substance were present in the nasal cavity of the 500 ppm exposure group (minimal to mild depletion of goblet cells on the nasal septum of Nose, Level 2). In the rats at 5000 and 10000 ppm, minimal to moderate depletion of the goblet cells was noted on the nasal septum of Nose, Level 2. Small numbers of cells with abundant non-staining cytoplasm were also interspersed where there was depletion of goblet cells.

Minimal to moderate hyperplasia of olfactory epithelium was also noted at Nose, Levels 3, 4 and 5, and consisted of increased numbers of nuclei.

There were no test substance-related effects in the bone marrow associated with exposure to Malathion Technical up to 10000 ppm.

1.2.2. Cholinesterase Subset

Consumed dosages for the rats for the entire exposure period (calculated as DSs 1 to 91) are tabulated below. The highest weekly consumed dosages occurred during the first two weeks of exposure.

Text Table 2
Mean Consumed Dosages (mg/kg bw/day)

Concentration in Diet (ppm)	Male Rats	Female Rats
100	6.2	6.6
500	31.4	33.8
5000	311.8	335.5
10000	635.3	680.3

One male rat at 100 ppm was found dead during the exposure period and another male rat at 500 ppm was humanely euthanized due to adverse clinical signs during the exposure period. These deaths were not considered to be test substance-related as they were isolated incidences. All other male and female rats in the cholinesterase subset survived until scheduled euthanasia.

There were no test substance-related adverse clinical signs or detailed clinical observations observed in the male and female rats during the 90-day exposure period.

Mean body weights were statistically significantly decreased on DS 85 in the male rats at 5000 ppm and at all intervals during the exposure period in the male rats at 10000 ppm.

Body weight gains were decreased or statistically significantly decreased in the male rats at 5000 and 10000 ppm for the entire exposure period. In the male rats at 5000 and 10000 ppm, there were additional instances of statistically significantly reduced body weight gains observed on DSs 1 to 8, 15 to 22, 22 to 29, 43 to 50 and 78 to 85. In the female rats at 10000 ppm, body weight gains were statistically significantly decreased during the first week of exposure.

Absolute feed consumption values were statistically significantly reduced in the male rats at 10000 ppm during the exposure period. In the male rats at 10000 ppm, marginally reduced or statistically significantly reduced absolute feed consumption values were also observed at all intervals during the exposure period. At 10000 ppm, the relative feed consumption values were statistically significantly increased in the male rats on DSs 8 to 15, 36 to 43, 71 to 78 and 78 to 85 in comparison with the Carrier Control group values. In the male rats at 5000 and 10000 ppm, feed efficiency was statistically significantly decreased during the entire exposure period. Feed efficiency values were also statistically significantly decreased in the male rats at 5000 and/or 10000 ppm at several additional intervals during the exposure period.

In the female rats at 10000 ppm, the absolute and relative feed consumption values and feed efficiency were statistically significantly decreased during the first week of exposure.

There were no test substance-related necropsy observations in the male or female rats.

Male and female rats at 5000 and 10000 ppm had statistically significantly reduced brain cholinesterase levels. Female rats in all exposure groups had statistically significantly reduced RBC cholinesterase levels, while the male rats at 500, 5000 and 10000 ppm exposure groups had statistically significantly reduced RBC cholinesterase levels.

2. DISCUSSION AND CONCLUSION

One hundred twenty five male rats and 125 female rats were assigned to five dosage groups (10 rats/sex/dosage group assigned to the main study and 15 rats/sex/dosage group were assigned to the cholinesterase subset). Rats were exposed to Malathion technical at concentrations corresponding to target doses of 0 (Carrier Control) ppm, 100 ppm, 500 ppm, 5000 ppm, and 10000 ppm (Groups I through V, respectively) for 90 consecutive days.

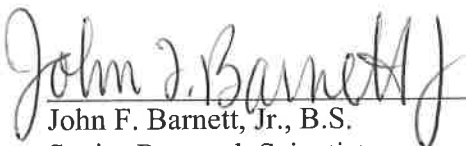
Repeated oral exposure to Malathion technical via the diet at exposure levels as high as 10000 ppm for 90 consecutive days did not cause any adverse clinical signs in male or female rats. There were also no test substance-related adverse observations apparent during the ophthalmologic examinations, necropsy evaluations, hematology or clinical chemistry changes or bone marrow evaluations.

Concentrations of 5000 and 10000 ppm produced reductions in body weight and body weight gains and reductions in absolute and relative feed consumption values and feed efficiency. The decreased feed consumption and body weights during the first week of exposure may have indicated an initial taste aversion of the Malathion Technical in the diet. The differences during the first week of exposure may have resulted in the overall body weight changes that occurred because the reductions occurred during the growth period.

At 5000 and 10000 ppm, there were organ weight increases in the liver and kidneys in both male and female rats at 10000 ppm. There was also an increase in the gamma-glutamyltransferase in the male rats at 10000 ppm. These increases are considered to reflect the metabolic changes occurring in the rats resulting from the continual exposure to Malathion technical. They were not considered to be adverse as they did not appear to produce any microscopic findings in either organ. Microscopic findings were present in the nasal cavity of the 500 ppm (depletion of goblet cells), and the 5000 and 10000 ppm (depletion of goblet cells and olfactory epithelial hyperplasia) in both the male and female rats. These local findings are considered to be the result of continued nasal exposure to Malathion technical in the diet.


Based on the results of this study, the no-observed-adverse-effect-level (NOAEL) for general toxicity was 100 ppm. Red blood cell cholinesterase inhibition was observed at all exposure levels in the female rats and at the 500 ppm and greater exposure levels in the male rats. The reduction observed in the female rats at 100 ppm was considered minor (10.2% inhibition compared with controls) and not toxicologically relevant.

Based on benchmark dose (BMD) modeling, the estimated dosage level for a 20% inhibition (BMD₂₀) of RBC cholinesterase activity was 48.7 mg/kg bw/day for male rats and 42.0 mg/kg bw/day for female rats. The lowest BMDL₂₀ value (lower 95th percentile confidence limit) was 41.0 mg/kg bw/day for male rats and 34.5 mg/kg bw/day for female rats. For the brain cholinesterase, the estimated dosage level for a 10% inhibition (BMD₁₀) was estimated to be 174.6 mg/kg bw/day for male rats and 118.4 mg/kg bw/day for female rats. The lowest BMDL₁₀ value for brain cholinesterase was 132.0 mg/kg bw/day for male rats and 103.3 mg/kg bw/day for female rats.


John F. Barnett, Jr., B.S.
Senior Research Scientist
Study Director

12 mar 2012
Date

This report has been reviewed for scientific content. The signature below indicates a concurrence with the Study Director's interpretation of these data as presented in this report.


Elise M. Lewis, Ph.D.
Director of Reproductive and Neurobehavioral Toxicology
Testing Facility Management

12 mar 2012
Date

3. DESCRIPTION OF TEST PROCEDURES

3.1. Conduct of Study

3.1.1. Sponsor

Cheminova A/S, P.O. Box 9, DK-7620 Lemvig, DENMARK

3.1.2. Testing Facility

Charles River Laboratories, Preclinical Services, 905 Sheehy Drive, Building A, Horsham, PA 19044, USA

3.1.3. Study Number

TQC00066

3.1.4. Purpose of the Study

The purpose of this study was to provide information on possible adverse effects on CrI:CD(SD) rats resulting from repeated exposure to Malathion technical over an extended period of time covering postweaning maturation and growth well into adulthood. The study was designed to provide information on toxicity, indicate target organs and the possibility of accumulation, and was also designed to provide an estimate of a no-observed-adverse-effect level (NOAEL) of exposure that could be used for establishing safety criteria for human exposure.

3.1.5. Study Design

The requirements of the Organisation for Economic Co operation and Development¹ and the U.S. Environmental Protection Agency² were used as the basis for study design.

3.1.6. Ownership of the Study

The Sponsor owns the study. All raw data, analyses, reports and preserved tissues are the property of the Sponsor.

3.1.7. Study Monitor

M. Jensen
Cheminova A/S

3.1.8. Study Director

John F. Barnett, Jr., B.S. (Senior Research Scientist)
Address as cited previously for Testing Facility.

3.1.9. Technical Performance**3.1.9.1. Charles River Laboratories, Preclinical Services****3.1.9.1.1. Pennsylvania**

Matthew J. Vaneman, B.S. (Director of Operations)

Gerard M. Zimmerman, ALAT (Study Supervisor)

Adam Shepherd, B.S. (Research Technician)

Kyle C. Harris (Necropsy Technician)

Melissa A. Snyder, B.S. (Research Associate)

Julian Gulbinski, III, B.S., M.B.A (Senior Manager Laboratory Sciences) - Cholinesterase Analyses

Jason Sarsoza, B.Sc. (Principal Investigator; Scientist I) - Dose Formulation Analyses

Michael H. Brown, DVM, MS, DACVO (Contributing Scientist, Veterinary Ophthalmologist)^a

3.1.9.1.2. Ohio

Rebecca M. Lucke B.S., MT (ASCP) (Principal Investigator) - Clinical Pathology Evaluation

3.1.9.1.3. Nevada

Angela Wilcox, BVSc, M.S., DACVP (Principal Investigator) - Bone Marrow Analysis

3.1.9.2. Charles River Laboratories, Pathology Associates**3.1.9.2.1. Maryland**

Daniel MacDonald - Histological Processing

3.1.9.2.2. Illinois

Carol J. Detrisac, DVM, Ph.D., DACVP (Principal Investigator) - Histopathological evaluation

3.1.10. Report Preparation

John F. Barnett, Jr., B.S.

Megan R. Lawhead, M.A. (Study Coordinator)

Alicia Del Rossi, B.A. (Study Coordinator)

a. See Appendix 2 (Deviations from the Protocol and Standard Operating Procedures of the Testing Facility).

3.1.11. Report Review

Alan M. Hoberman, Ph.D., DABT, Fellow ATS (Executive Director, Site Operations and Toxicology)

3.1.12. Date Protocol Signed

11 January 2011

3.1.13. Dates of Technical Performance

Rat Arrival and Experimental Start Date (OECD) 11 JAN 2011
 Experimental Start Date (EPA) 18 JAN 2011
 Experimental Completion/Termination Date 11 JAN 2012

3.1.13.1. Main Study

Text Table 3
 Dates of Technical Performance - Main Study

	Replicate 1 (Male Rats)	Replicate 2 (Male Rats)	Replicate 3 (Female Rats)	Replicate 4 (Female Rats)
Exposure Period (DS ^a 1 to 90)	18 JAN 2011 - 17 APR 2011	19 JAN 2011 - 18 APR 2011	20 JAN 2011 - 19 APR 2011	21 JAN 2011 - 20 APR 2011
Blood Sample Collection and Euthanasia (DS 91)	18 APR 2011	19 APR 2011	20 APR 2011	21 APR 2011

3.1.13.2. Cholinesterase Subset

Text Table 4
 Dates of Technical Performance - Cholinesterase Subset

	Replicate 5 (Male Rats)	Replicate 6 (Female Rats)
Exposure Period (DS 1 to 90)	26 JAN 2011 - 25 APR 2011	27 JAN 2011 - 26 APR 2011
Blood Sample Collection and Euthanasia (DS 91)	26 APR 2011	27 APR 2011

3.1.14. Records Maintained

The original protocol, amendments, and report, raw data and reserve samples of the bulk test substance, corn oil, and each lot of the carrier are retained in the archives of the Testing Facility. Any preserved tissues are retained in the archives of the Testing Facility one year after delivery of the final report, after which time the Sponsor will decide their final disposition. Unused prepared diets were discarded at the Testing Facility. Backup samples were discarded at the Testing Facility prior to issuance of the final report. Disposition of the remaining bulk test substance was documented in the raw data after consultation with the Sponsor.

a. DS is an abbreviation used for day of study.

All slides residual wet tissue, blocks, histology data, and the histopathology report were returned to Charles River Laboratories, Preclinical Services, Pennsylvania, USA for archiving at the completion of the study.

All bone marrow slides and the bone marrow report were returned to Charles River Laboratories, Preclinical Services, Pennsylvania, USA for archiving at the completion of the study.

3.2. Test Substance, Corn Oil, and Carrier Information

Text Table 5
Test Substance, Corn Oil, and Carrier Information

Test Substance Information			
Name:	Malathion technical ^a	Description:	Light, yellow liquid
Storage:	Refrigerated (2°C to 8°C), protected from light	Supplier:	Sponsor
Batch Number	CAS Number	Date Received	Expiration Date
D2014-OSJ-MLT-01-S	121-75-5	05 AUG 2010	28 SEP 2013

Corn Oil Information		
Name:	Corn Oil ^b	Description:
Storage:	Room temperature	Supplier:
		Clear, yellow liquid Charkit Chemical Corporation, South Norwalk, CT, USA
Lot Number	Date Received	Expiration Date
M-631	15 OCT 2010	18 MAR 2012

Carrier Information				
Name	Lot Number	Supplier	Storage Condition	Expiration Date
PMI [®] Certified Rodent Meal	DEC 15 10 2A	Animal Specialties and Provisions, LLC ^c	Room temperature	15 JUN 2011

- a. Malathion technical is synonymous with Malathion (CHA 300) and Fyfanon[®] Technical. The test material was spiked with the relevant impurities to the limit of the specification (see CofA in Appendix 3).
- b. The corn oil served to minimize the dust production during diet preparation and usage.
- c. Animal Specialties and Provisions, LLC, Quakertown, PA, USA

Text Table 6
Sampling Chart

Sampling				
Bulk Test Substance Reserve				
Sample Size:		5 mL		
Date Sampled	Storage Conditions		Date Archived	
12 JAN 2011	Refrigerated, protected from light		04 FEB 2011	
Bulk Corn Oil Reserve				
Sample Size:		5 mL		
Date Sampled	Storage Conditions		Date Archived	
12 JAN 2011	Room temperature		04 FEB 2011	
Bulk Carrier Reserve				
Sample Size:		125 g		
Date Sampled	Storage Conditions		Date Archived	
12 JAN 2011	Room temperature		04 FEB 2011	
Concentration and Homogeneity ^{a,b}				
Sample Size:		25 g		
Date Sampled	Date Transferred	Storage Conditions	Transfer Conditions ^c	Purpose
12 JAN 2011	12 JAN 2011	Transferred to the analytical laboratory immediately following preparation, ambient conditions, protected from light		Concentration, Homogeneity
26 JAN 2011	27 JAN 2011	Refrigerated, protected from light	Ambient conditions, protected from light	Concentration
10 FEB 2011	10 FEB 2011	Transferred to the analytical laboratory immediately following preparation, ambient conditions, protected from light		
24 FEB 2011	24 FEB 2011 ^d			
10 MAR 2011	25 MAR 2011	Refrigerated, protected from light	Ambient conditions, protected from light	
24 MAR 2011	25 MAR 2011 ^e			
08 APR 2011	11 APR 2011	Refrigerated, protected from light	Ambient conditions, protected from light	

- Before initiation of dosage, the homogeneity and concentration of the prepared formulations (diets) were verified. Results of the homogeneity and concentration analyses of the first test substance diet preparation to be used during the study were approved by the Study Director before administration. In addition, the results of the concentration of the prepared formulations (diets) for Weeks 1, 3, 5, 9, and 13 were verified and approved by the Study Director prior to use.
- Quadruplicate samples for homogeneity analysis were taken from the top, middle and bottom of each concentration from the first diet preparation on the day prepared. All samples were transferred to the analytical laboratory at the Testing Facility and a duplicate set of samples from each quadruplicate set was analyzed for homogeneity according to a validated method (analytical procedure MALA02). The mean concentration result of the homogeneity analysis for each level was also used to verify the concentrations for Week 1. Duplicate samples were taken for concentration analysis on each day of diet preparation from each concentration. All samples were transferred to the analytical laboratory at the Testing Facility. One sample of each set from diet preparations for Weeks 1, 3, 5, 9, and 13 was analyzed in duplicate for concentration according to a validated method (analytical procedure MALA02). Samples collected during the intermediary periods were stored refrigerated (2°C to 8°C), protected from light. All remaining samples were retained at the Testing Facility as backup samples. Additional concentration samples (25 g) were taken at each diet preparation for possible concentration verification and stored refrigerated, protected from light. Disposition of the additional concentration samples was documented in the raw data.
- See Appendix 2 (Deviations).
- Week 7 samples were collected, but not analyzed. See Appendix 6 (Analytical Report).
- Week 11 samples were analyzed, but the results were not reported due to poor chromatography. See Appendix 6 (Analytical Report).

3.2.1. Special Handling Instructions

Double nitrile gloves, full faced positive pressure hood, appropriate eye protection and Tyvek[®] suit were worn during formulation preparation and dosage administration^a. Gloves were washed with soap and water or sprayed with an appropriate cleaning solution prior to removal and then disposed of in a biohazard container. For all other study activities, standard safety precautions (gloves, dust-mist/HEPA-filtered mask, appropriate eye protection and protective clothing) were followed.

3.2.2. Analysis of Activity/Purity

The test substance was considered 95.8% active/pure for the purpose of dosage calculations. Information to document or certify the identity, composition, strength, stability and activity/purity of the test substance was provided by the Sponsor to the Testing Facility. A Certificate of Analysis for the test substance is available in Appendix 1, Attachment 2.

The Study Director was not aware of any potential contaminants likely to have been present in the carrier or corn oil that would have interfered with the results of this study. A Certificate of Analysis for the corn oil is available in Appendix 3.

3.3. Test Substance Preparation and Storage Conditions

Formulations (diets) were prepared bi-weekly at the Testing Facility and were stored refrigerated (2°C to 8°C) until use^a.

3.4. Test System

3.4.1. Species/Strain

Crl:CD(SD) Rat

3.4.2. Supplier (Source)

Charles River Laboratories, Inc., Kingston, NY, USA

3.4.3. Sex

Male and female

3.4.4. Rationale for Test System

The Crl:CD(SD) rat was selected as the Test System because it is one mammalian species accepted for use in toxicity studies and it has been widely used throughout industry for toxicity evaluations.

a. See Appendix 2 (Deviations).

3.4.5. Test System Data

Approximate Date of Birth	07 DEC 2010
Approximate Age at Arrival	36 days

3.4.5.1. Male Rats

Number of Rats Acclimated	135
Number of Rats Assigned to Study	125
Weight (g) the Day after Arrival	82 - 117
Weight (g) at Study Assignment	130 - 168

3.4.5.2. Female Rats

Number of Rats Acclimated	135
Number of Rats Assigned to Study	125
Weight (g) the Day after Arrival	67 - 113
Weight (g) at Study Assignment	107 - 158

3.4.6. Method of Randomization

Upon arrival, rats were assigned to individual housing on the basis of computer-generated random units. After 6 days of acclimation, rats were selected for study on the basis of physical appearance and body weights recorded during acclimation. The rats were assigned to five dosage groups (Groups I through V), based on computer-generated (weight-ordered) randomization procedures so that the body weights of the rats did not exceed $\pm 20\%$ of the mean body weight of each sex.

At the time of randomization, the first 10 rats/sex/dosage group were assigned to the main study and the remaining 15 rats/sex/dosage group were assigned to the cholinesterase subset.

In order to accommodate the necropsy schedule, rats assigned to the main study were assigned to four replicates that began test diet exposure and were euthanized over four consecutive days. Rats assigned to the cholinesterase subset were assigned to two replicates by sex, and began exposure and were euthanized over two consecutive days.

3.4.7. System of Identification

Rats were assigned temporary numbers at receipt and given permanent identification numbers when assigned to the study before the first day of exposure. Rats were permanently identified using Monel[®] self-piercing ear tags.

3.5. Husbandry

3.5.1. Research Facility Registration

USDA Registration No. 14-R-0144 under the Animal Welfare Act, 7 U.S.C. 2131 *et seq.*

3.5.2. Study Room

The study rooms were maintained under conditions of positive airflow relative to a hallway and independently supplied with a minimum of 10 changes per hour of 100% fresh air that had been passed through 99.97% HEPA filters. Room temperature and humidity were monitored constantly throughout the study. Room temperature was targeted at 64°F to 79°F (18°C to 26°C); relative humidity was targeted at 30% to 70%^a.

3.5.3. Housing

Rats were individually housed in stainless steel, wire-bottomed cages. All cage sizes and housing conditions were in compliance with the *Guide for the Care and Use of Laboratory Animals*³.

3.5.4. Light

An automatically controlled 12-hours light:12-hours dark fluorescent light cycle was maintained. Each dark period began at 1900 hours (\pm 30 minutes). Lights were turned on 35 minutes early on 13 February 2011 to perform room activities.

3.5.5. Sanitization

Cage pan liners were changed at least three times weekly. Cages were changed approximately every other week.

3.5.6. Diet

During the acclimation period, rats were given *ad libitum* access to Certified Rodent Diet[®] #5002 (PMI[®] Nutrition International, St. Louis, MO, USA) in individual feeders.

During the exposure period, rats were given *ad libitum* access in individual feeders to either Certified Rodent Diet[®] #5002 (PMI[®] Nutrition International) only (carrier control group [Group I]) or test diets prepared using Certified Rodent Diet[®] #5002 and the test substance (Groups II through V)^b.

a. See Appendix 4 (Environmental and Husbandry Reports).

b. See Appendix 2 (Deviations).

3.5.7. Diet Analysis

Analyses were routinely performed by the feed supplier. No contaminants at levels exceeding the maximum concentration limits for certified feed or deviations from expected nutritional requirements were detected by these analyses. Copies of the results of the feed analyses are available in the raw data and in Appendix 4.

The Study Director was not aware of any potential contaminants likely to have been present in the feed that would have interfered with the results of this study.

3.5.8. Enrichment

Chewable Nylabones[®] were supplied to all rats during the course of the study. Analyses for possible contamination were conducted on each lot of Nylabones[®] and were documented in the raw data and in Appendix 4.

The Study Director was not aware of any potential contaminants likely to have been present in the enrichment devices that would have interfered with the results of this study.

3.5.9. Water

Local water that had been processed by passage through a reverse osmosis membrane (R.O water) was available to the rats *ad libitum* from an automatic watering access system^a and/or individual water bottles attached to the cages. Chlorine was added to the processed water as a bacteriostat.

3.5.10. Water Analysis

The processed water is analyzed twice annually for possible chemical contamination (Lancaster Laboratories, Lancaster, PA, USA) and monthly for possible bacterial contamination (QC Laboratories, Southampton, PA, USA). Copies of the results of the water analyses are available in the raw data and in Appendix 4.

The Study Director was not aware of any potential contaminants likely to have been present in the water that would have interfered with the results of this study.

3.5.11. Veterinary Care

During the course of the study, individual rats were examined by the veterinary staff, when needed due to adverse clinical observations. One female rat in the 500 ppm exposure group was provided an additional water source and the lower incisors were monitored and trimmed as needed from DS 85 until scheduled euthanasia. All male and female rats had their teeth examined and trimmed as necessary on DS 28 to 29 (cholinesterase subset male and female rats) or DS 34 to 37 (main study male and female rats). None of the medical examinations and water

a. See Appendix 2 (Deviations).

supplementation had an adverse impact on the integrity of the study data or on the interpretation of the study results.

3.6. Methods

3.6.1. Dosage Administration

Text Table 7
Dosage Administration

Dosage Group	Number of Rats Per Sex	Concentration (ppm)
I	10 ^a + 15 ^b	0 (Carrier Control)
II	10 ^a + 15 ^b	100
III	10 ^a + 15 ^b	500
IV	10 ^a + 15 ^b	5000
V	10 ^a + 15 ^b	10000

The test substance was considered 95.8% active/pure for the purpose of dosage calculations

- The first 10 rats/sex/dosage group were assigned to the main study
- The remaining 15 rats/sex/dosage group were assigned to the cholinesterase subset.

Text Table 8
Assigned Rat Numbers

Dosage Group	Main Study				Cholinesterase Subset	
	Male Rats		Female Rats		Male Rats	Female Rats
	Replicate 1	Replicate 2	Replicate 3	Replicate 4	Replicate 5	Replicate 6
I	3776 - 3780	3781 - 3785	3901 - 3905	3906 - 3910	3786 - 3800	3911 - 3925
II	3726 - 3730	3731 - 3735	3851 - 3855	3856 - 3860	3736 - 3750	3861 - 3875
III	3801 - 3805	12250 ^a , 3807 - 3810	3926 - 3930	3931 - 3935	3811 - 3825	3936 - 3950
IV	3751 - 3755	3756 - 3760	3951 - 3955	3956 - 3960	3761 - 3775	3961 - 3975
V	3701, 18077 ^b , 3703 - 3705	3706 - 3710	3876 - 3880	3881 - 3885	3711 - 3725	3886 - 3900

- Rat 3806 was euthanized on DS 1 prior to exposure due to adverse clinical observations, was replaced by rat 12250, and excluded from study.
- Rat 3702 was euthanized on DS 1 prior to exposure due to adverse clinical observations noted during the predose detailed clinical observation, was replaced by rat 18076, and was excluded from study. Rat 18076 was euthanized on DS 1 prior to exposure due to adverse clinical observations noted during the predose detailed clinical observation, was replaced by rat 18077, and was excluded from study.

3.6.2. Rationale for Dosage Selection

Dosage levels were selected by the Sponsor on the basis of previous studies conducted with the test substance.

The highest dosage level was expected to induce toxicity but not death or severe suffering. The descending sequence of the lower dosage levels were selected for the purpose of demonstrating any dosage-related response, with no adverse effects expected at the lowest level.

3.6.3. Route and Rationale for Route of Administration

The oral (diet) route was selected for use because it is a possible route of human exposure.

3.6.4. Method and Frequency of Administration

A constant concentration of the test substance in the diet was offered to the rats, and the mg/kg/day dosages consumed were calculated and presented for periods corresponding to body weight and feed consumption observations. A carrier control and four test diet concentrations were given to the rats^a. Rats were given continual access to the test substance in the diet for 90 consecutive days. The first day of test diet exposure for each replicate was considered DS 1.

3.6.5. Method of Study Performance

Rats were observed for viability at least twice each day^a of the study and for clinical observations and general appearance twice during the acclimation period. The rats were also examined for clinical observations and general appearance daily during the exposure period^a.

Detailed clinical observations were recorded once before the first day of exposure and once weekly until scheduled euthanasia^a. The detailed clinical observations were conducted by an observer unaware of the group assignment of the rat^a.

Body weights were recorded twice during the acclimation period, daily during the first 7 days of exposure for each replicate and weekly thereafter. A terminal body weight was recorded on the day of scheduled euthanasia. Feed consumption values were recorded daily during the first 7 days of exposure for each replicate and weekly thereafter^a. A feed left weight prior to the initiation of fasting was recorded for rats assigned to the main study. A feed left value was recorded on the day of euthanasia for rats assigned to the cholinesterase subset.

Ophthalmological examinations were performed by a veterinary ophthalmologist^a for all rats assigned to the main study prior to assignment to study and on DSs 84 through 87. Results of the ophthalmological examinations are available in Appendix 5 (Ophthalmological Report).

3.6.6. Clinical Pathology - Main Study

At scheduled euthanasia on DS 91, whole blood samples (3 mL each) were collected from rats assigned to the main study. Blood samples were collected from the inferior vena cava of each rat while under anesthesia (isoflurane/oxygen). Rats were fasted overnight for no more than 24 hours prior to collection. Samples were collected according to Text Table 9.

Text Table 9
Samples for Clinical Pathology Evaluation

Group Nos.	Time Point	Hematology	Clinical Chemistry
1-5 (Main Study)	DS 91	X	X

X = sample to be collected

a. See Appendix 2 (Deviations).

Any residual/retained clinical pathology samples were discarded prior to issuance of the Final Report.

The tubes containing the samples were labeled with the protocol number, rat number, group number, dosage level, day of study, collection interval, date of collection, species, generation and storage conditions.

3.6.6.1. Hematology

On DS 91, 1.5 mL of blood was transferred into K₂EDTA-coated (lavender top) tubes. All samples were placed on a tilter and maintained at ambient conditions. Each sample was checked for clots. Blood samples were analyzed for the parameters specified in Text Table 10.

Text Table 10
Hematology Parameters

Red blood cell count	White blood cell count
Hemoglobin concentration	Neutrophil count
Hematocrit	Lymphocyte count
Mean corpuscular volume	Monocyte count
Mean corpuscular hemoglobin concentration	Eosinophil count
Mean corpuscular hemoglobin	Basophil count
Reticulocyte count (absolute)	Large unstained cells
Mean platelet volume	Other cells (as appropriate)
Platelet count	

Note: Blood smear slides were prepared for all animals for possible RBC morphology evaluation. Two slides per animal were prepared at the Testing Facility and stained by PCS-Ohio. Slide review was only performed on samples that meet flagging criteria to confirm accurate hematology data.

Blood samples were stored refrigerated (2°C to 8°C) until shipment (refrigerated on cold packs) on the day of collection. Differential leukocyte slides were maintained and shipped at ambient conditions. All samples (whole blood and slides) were shipped by overnight courier to Charles River Laboratories, Preclinical Services, Ohio, USA. Upon receipt, the samples were maintained at room temperature for immediate analysis.

3.6.6.2. Clinical Chemistry

On DS 91, 1.5 mL of blood was transferred into serum separator tubes and centrifuged at room temperature for at least 10 minutes. The resulting sera samples were frozen on dry ice as soon as possible and maintained frozen ($\leq -60^{\circ}\text{C}$) until shipment for analysis of the parameters specified in Text Table 11.

Text Table 11
Clinical Chemistry Parameters

Alanine aminotransferase	Total protein
Aspartate aminotransferase	Albumin
Alkaline phosphatase	Globulin
Gamma-glutamyltransferase	Albumin/globulin ratio
Total bilirubin	Glucose
Urea nitrogen	Cholesterol
Creatinine	Triglycerides
Calcium	Sodium
Phosphorus	Potassium
	Chloride

Samples were shipped on dry ice by overnight courier to Charles River Laboratories, Preclinical Services, Ohio, USA. Upon receipt, serum samples were stored in a -20°C freezer until analysis.

Following the completion of analysis and verification of the results, all residual clinical pathology samples were discarded in accordance with applicable SOPs. Results of the hematology and clinical chemistry analyses are available in Appendix 7 (Clinical Pathology Report).

3.6.7. Cholinesterase Assay - Cholinesterase Subset^a

On DS 91, whole blood samples (2.0 to 3.0 mL each) were collected from each rat assigned to the cholinesterase subset.

Prior to blood collection, syringes were flushed with EDTA to prevent clotting. Blood was collected under isoflurane/oxygen anesthesia from the inferior vena cava (the rats were in the isoflurane/oxygen for no longer than 5 minutes prior to blood collection). The time for each blood collection was between 3 and 10 seconds. The blood was transferred into EDTA-coated (lavender-top) tubes and the tubes were stored under cold packs on a tilter until processing and were analyzed for RBC cholinesterase levels at the Testing Facility.

After blood sample collection and euthanasia, brains were excised, and weighed (weight recorded to three decimal places). The brains were then placed into a tared conical tube containing saline and were maintained on wet ice until processing and were analyzed for cholinesterase levels at the Testing Facility.

All processed samples were held on wet ice or refrigerated until assayed. The blood and brain samples were analyzed for cholinesterase levels at the Testing Facility on the same day that they were collected, according to the Study Specific Procedure located in Appendix 1, Attachment 4. RBC and brain samples were processed and assayed as soon as possible, with the experimental target that samples be analyzed within 90 minutes of euthanasia^a.

Following analysis, samples were retained refrigerated or on wet ice until transferred to frozen (-15°C to -30°C) storage. These samples were discarded prior to issuance of the final report. Disposition of these samples was documented in the raw data.

a. See Appendix 2 (Deviations).

3.6.8. Terminal Procedures

3.6.8.1. Method of Euthanasia

Rats assigned to the main study and cholinesterase subset were anesthetized under the isoflurane/oxygen and following blood collection from the inferior vena cava, subsequently euthanized by an injection of sodium pentobarbital into the inferior vena cava.

3.6.8.2. Unscheduled Deaths

One male rat was found dead and one male rat was euthanized before scheduled termination. Both rats were assigned to the cholinesterase subset. The rats were examined for the cause of death or condition as soon as possible after the observation was made. In addition, the nasal passages, the nasal cavity and neck with associated organs and tissues were examined. See Section 3.6.8.5 (Tissue Collection and Preservation) for retained tissues; all other tissues were discarded.

3.6.8.3. Scheduled Euthanasia

All surviving rats were euthanized on DS 91, one day following the last day of control or test diet exposure.

3.6.8.4. Necropsy

3.6.8.4.1. Main Study

On DS 91, all rats were anesthetized under the isoflurane/oxygen, and following blood collection from the inferior vena cava, were subsequently euthanized by an injection of sodium pentobarbital into the inferior vena cava. Blood was collected and processed for Clinical Pathology as described in Section 3.6.6 (Clinical Pathology).

Rats were necropsied and examined for gross lesions. Representative photographs of gross lesions are available in the raw data. Tissue trimming and histopathology was performed under the supervision of or by a Board Certified Veterinary Pathologist.

Gross necropsy included an initial physical examination of external surfaces and all orifices, as well as an internal examination of tissues and organs *in situ*. The following were examined: external and internal portions of all hollow organs; the external surfaces of the brain and spinal column; the nasal passages, the nasal cavity and neck with associated organs and tissues; the thoracic, abdominal and pelvic cavities with associated organs and tissues; and the musculo/skeletal carcass. The lungs were perfused with neutral buffered 10% formalin.

See Section 3.6.8.5 (Tissue Collection and Preservation) for retained tissues; all other tissues were discarded.

3.6.8.4.2. Cholinesterase Subset

On DS 91, surviving rats were anesthetized under the isoflurane/oxygen, and following blood collection from the inferior vena cava, were subsequently euthanized by an injection of sodium pentobarbital into the inferior vena cava. Blood was collected and evaluated for RBC cholinesterase levels, and the brain was excised, weighed and evaluated for cholinesterase levels as described in Section 3.6.7 (Cholinesterase Assay - Cholinesterase Subset). A gross necropsy of the thoracic, abdominal, and pelvic viscera was performed. Carcasses were discarded without further evaluation.

3.6.8.5. Tissue Collection and Preservation

Representative samples of the tissues identified in Text Table 12 were collected from all rats assigned to the main study and preserved in 10% neutral buffered formalin, unless otherwise indicated.

Text Table 12
Tissue Collection and Preservation

Tissue	Weighed	Collected	Microscopically Evaluated	Comment
Animal identification	-	X	-	-
Artery, aorta	-	X	X	From thoracic segment.
Bone marrow smear	-	X	X	Two smears were collected per animal (in duplicate). Bone marrow smears were collected from the sternum at scheduled necropsies for examination. Bone marrow smears were allowed to air dry and are not fixed in formalin.
Bone marrow, femur	-	X	X	Examined by the Principal Investigator for histopathology.
Bone, femur	-	X	X	Collected distal end to include femoral tibial joint.
Bone, sternum	-	X	X	See Appendix 2 (Deviations)
Brain	X	X	X	Forebrain, midbrain, cerebellum, and medulla oblongata. Weighed to three decimal places.
Cervix	X	X	X	Collected and weighed with uterus.
Epididymis	X	X	X	Paired weight and examination.
Esophagus	-	X	X	-
Eye	-	X	X	Paired examination; Preserved in Davidson's fixative (euthanized animals only), rinsed and transferred to 10% neutral buffered formalin.
Gland, adrenal	X	X	X	Paired weight and examination.
Gland, harderian	-	X	X	Paired examination. Collected with eye (preserved in Davidson's fixative (euthanized animals only), rinsed and transferred to 10% neutral buffered formalin.
Gland, mammary	-	X	X	Collected with inguinal skin. (Mammary gland was collected and examined in the female rats).
Gland, parathyroid	-	X	X	Collected with thyroid: Examined only if present in the routine section of thyroid.
Gland, pituitary	-	X	X	-
Gland, prostate	X	X	X	-

Tissue	Weighed	Collected	Microscopically Evaluated	Comment
Gland, salivary	-	X	X	Submandibular.
Gland, seminal vesicle with coagulating gland	X	X	X	-
Gland, thyroid	X	X	X	Fixed weight. Paired weight and examination; weight included parathyroid
Gross lesions/masses	-	X	X	Scheduled euthanasia (main study) and found dead and unscheduled euthanasia (cholinesterase subset).
Gut-associated lymphoid tissue	-	X	X	Collected with small intestine.
Heart	X	X	X	Scheduled euthanasia (main study) and found dead and unscheduled euthanasia (cholinesterase subset).
Kidney	X	X	X	Paired weight and examination.
Large intestine, cecum	-	X	X	Scheduled euthanasia (main study) and found dead and unscheduled euthanasia (cholinesterase subset).
Large intestine, colon	-	X	X	-
Large intestine, rectum	-	X	X	-
Liver	X	X	X	Scheduled euthanasia (main study) and found dead and unscheduled euthanasia (cholinesterase subset).
Lung	X	X	X	Infused with 10% neutral buffered formalin after weighing. All scheduled euthanasia and found dead (cholinesterase subset).
Lymph node, mandibular	-	X	X	-
Lymph node, mesenteric	-	X	X	-
Muscle, skeletal	-	X	X	From thigh.
Nasal Passages	-	X	X	Collected with sinuses. Scheduled euthanasia (main study) and found dead and unscheduled euthanasia (cholinesterase subset).
Nerve, optic	-	X	X	Preserved in Davidson's fixative (euthanized animals only); rinsed and transferred to 10% neutral buffered formalin. Examined only if present in the routine section of the eye.
Nerve, sciatic	-	X	X	-
Ovary	X	X	X	Paired weight and examination.
Oviduct	X	X	X	Collected and weigh with uterus.
Pancreas	-	X	X	-
Rectum	-	X	X	-
Skin	-	X	X	-
Small intestine, duodenum	-	X	X	-
Small intestine, ileum	-	X	X	-
Small intestine, jejunum	-	X	X	-
Spinal cord	-	X	X	Cervical, thoracic, lumbar.

Tissue	Weighed	Collected	Microscopically Evaluated	Comment
Spleen	X	X	X	Scheduled euthanasia (main study) and found dead and unscheduled euthanasia (cholinesterase subset).
Stomach	-	X	X	Glandular and nonglandular regions. Scheduled euthanasia (main study) and found dead and unscheduled euthanasia (cholinesterase subset).
Testis	X	X	X	Paired weight and examination; Preserved in Modified Davidson's fixative (euthanized animals only), rinsed and transferred to 10% neutral buffered formalin.
Thymus	X	X	X	-
Tongue	-	X	X	Collected with larynx and pharynx.
Trachea	-	X	X	-
Ureter	-	X	X	-
Urinary bladder	-	X	X	-
Uterus	X	X	X	-
Vagina	-	X	X	-

3.6.8.6. Histology

Tissues that include the nasal cavity and turbinates were processed for rats assigned to the main study from all exposure groups (Groups I through V) and all other tissues from rats assigned to the main study in exposure groups I and V (control and high, respectively), were processed at Charles River Laboratories, Pathology Associates, Maryland, USA. Tissues in the Tissue Collection and Preservation table were processed, embedded in paraffin, sectioned, mounted on glass slides, and stained with hematoxylin and eosin.

3.6.8.7. Histopathology

All gross lesions were examined histologically. Histopathological evaluation was performed by a board-certified veterinary pathologist.

Tissues that include the nasal cavity and turbinates were trimmed, embedded in paraffin, sectioned, mounted on glass slides, and stained with Hematoxylin and eosin. The nasal tissue was trimmed consistent with the procedures described by Young⁴. In addition to the four routine sections delineated by Young, the most rostral section of the nose, to include nares, were also examined microscopically by the Principal Investigator for histopathology.

Histological examination was performed on all rats assigned to the main study in Groups I and V (control and high, respectively) and on the nasal cavity and turbinates from all exposure groups (Groups I through V).

Following preliminary review of the bone marrow smears obtained from the sternum by the Principal Investigator for bone marrow analysis, it was determined that many smears were of insufficient cellularity for proper evaluation; therefore, a qualitative histopathological evaluation of the bone marrow from the femur from the control and the high dosage group rats was performed by the Principal Investigator for histopathology.

Results of the histopathological evaluations are available in Appendix 8 (Histopathological Report).

3.6.8.8. Bone Marrow Smear Evaluation

Two bone marrow smears were collected per rat (in duplicate). Bone marrow smears were collected from the sternum at scheduled and unscheduled necropsies for examination. Bone marrow smears were allowed to air dry and were not fixed in formalin. All bone marrow smears were shipped unstained and uncoverslipped to Charles River Laboratories, Preclinical Services, Reno, USA for cytologic evaluation.

Bone marrow cytologic preparations were evaluated, and a myeloid:erythroid ratio was determined and quantified for each rat. Lymphocytes were counted and presented as a percentage of cells per 200 myeloid and erythroid cells counted. In addition, the bone marrow smears were evaluated for morphologic or maturation abnormalities.

Results of the bone marrow smear evaluation are available in Appendix 9 (Bone Marrow Analysis Report).

3.6.9. Data Collection and Statistical Analyses

Data generated during the course of this study were recorded either by hand or using the *Argus Automated Data Collection and Management System* (Version 13.11.17.7 or higher), the *Vivarium Temperature and Relative Humidity Monitoring System* (Version 2.0), *Dispense* (Version 7.0.3), *TotalChrom*[®] (Version 6.2.1 [for HPLC]) and *SPECTRAmax* 190. All data were tabulated, summarized and statistically analyzed using the *Argus Automated Data Collection and Management System*, *SoftMax*[®] PRO (Version 1.2 and 4.0), *Microsoft*[®] *Excel* [part of *Microsoft*[®] Office 2003 (or later versions)], *Quattro Pro* (Version 8.0) and *The SAS System* (version 6.12).

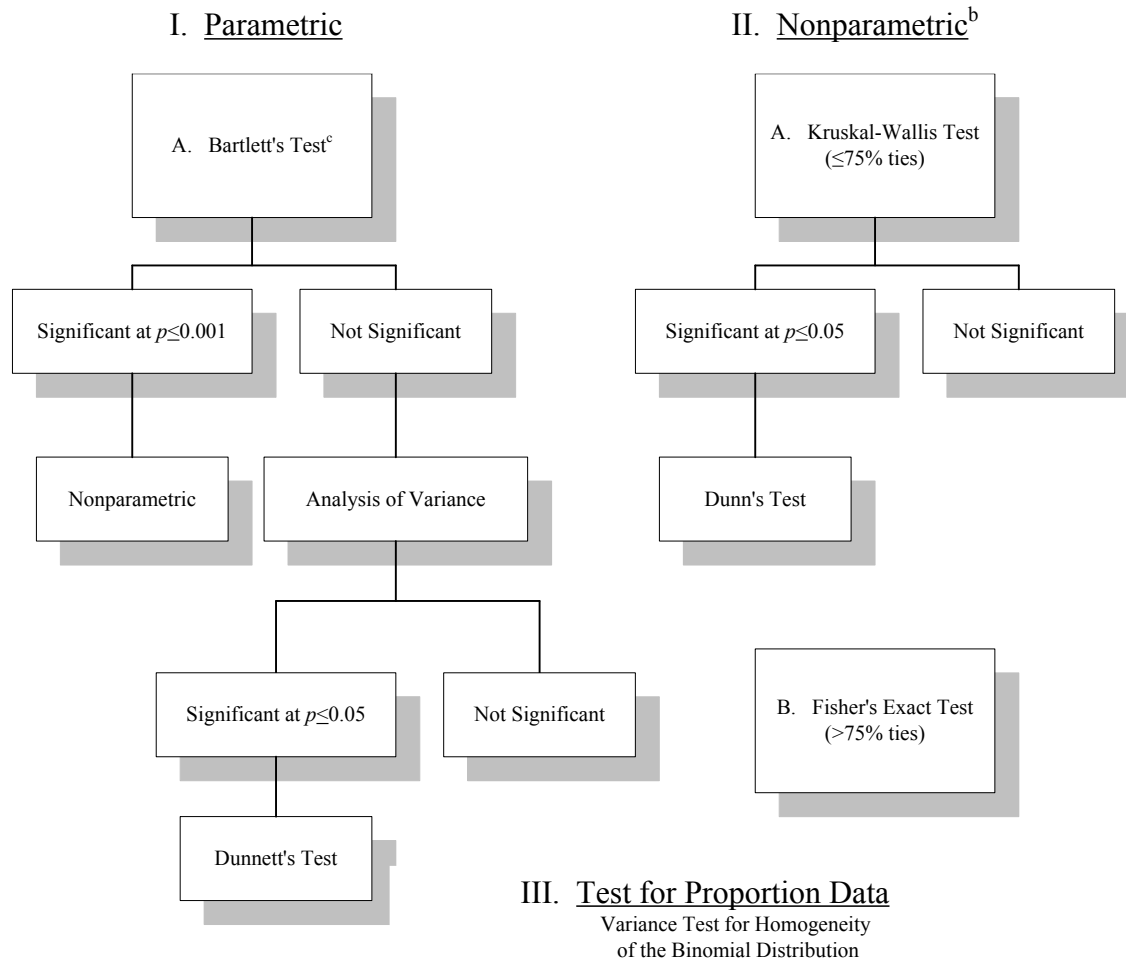
The following computerized systems were used by PCS-OH during the course of the clinical pathology analyses phase of the study.

Text Table 13
Critical Computerized Systems

System Name	Version Number	Description of Data Collected and/or Analyzed
Compaq Alpha DS10 Computer using the Toxicology Analysis System Customized, General Toxicology Module	1.0.0 or higher	Applicable clinical pathology data
Systems 600 Apogee Insight System	3.0 or higher	Temperature and/or humidity (animal rooms, refrigerators, freezers, and compound storage, as applicable)

Averages and percentages were calculated. The following schematic represents the statistical analyses of the data:

Type of Test^a



-
- a. Statistically significant probabilities are reported as either $p \leq 0.05$ or $p \leq 0.01$.
 - b. Proportion data are not included in this category.
 - c. Test for homogeneity of variance.

Clinical observations and other proportional data were analyzed, using the Variance Test for Homogeneity of the Binomial Distribution⁵.

Continuous data (e.g., body weights, body weight changes, feed consumption values and organ weights) were analyzed, using Bartlett's Test of Homogeneity of Variances⁶ and the Analysis of Variance⁷, when appropriate [i.e., Bartlett's Test was not significant ($p > 0.001$)]. If the Analysis of Variance was significant ($p \leq 0.05$), Dunnett's Test⁸ was used to identify the statistical significance of the individual groups. If the Analysis of Variance was not appropriate [i.e., Bartlett's Test was significant ($p \leq 0.001$)], the Kruskal-Wallis Test⁹ was used. In cases where the Kruskal-Wallis Test was statistically significant ($p \leq 0.05$), Dunn's Method of Multiple Comparisons¹⁰ was used to identify the statistical significance of the individual groups. If there were greater than 75% ties, Fisher's Exact Test¹¹ was used to analyze the data.

Count data were evaluated, using the procedures described above for the Kruskal-Wallis Test⁹.

Cholinesterase values for RBC and brains were evaluated as separate dependent variables in one-way analyses of variance (ANOVA)⁷ at each combination of sex (male and female). In the event that the ANOVA was significant ($p \leq 0.05$), Dunnett's test⁸ was used to identify the statistical significance of the individual groups.

Statistical analysis was performed on hematology and serum chemistry by Charles River, Laboratories, Preclinical Services, Ohio, USA. To determine the appropriate statistical test for hematology and serum chemistry, each data set was subjected to a statistical decision tree using the Toxicology Analysis System Customized (version 1.47.5 or higher). A minimum of three animals/sex/group per interval were required for statistical analysis.

Data sets for each interval were initially analyzed for homogeneity of variance using Levene's test¹² followed by the Shapiro-Wilk test¹³ for normality. A $p < 0.001$ level of significance was required for each test to reject the null hypothesis.

If both assumptions were fulfilled, a single-factor ANOVA was applied, with animal grouping as the factor, utilizing a $p < 0.05$ level of significance. If the parametric ANOVA was significant at $p < 0.05$, Dunnett's test was used to identify statistically significant differences between the control group and each test article treated group at the 0.05 level of significance.

If either of the parametric assumptions was not satisfied, then the Kruskal-Wallis nonparametric ANOVA procedure was used to evaluate intergroup differences ($p < 0.05$). If the non-parametric Kruskal-Wallis ANOVA was significant at $p < 0.05$, Dunn's test was used to identify statistically significant differences between the control group and each test article-treated group using a minimum significance level of $p < 0.05$.

4. RESULTS

4.1. Analytical Results (Appendix 6)

Preparations of Malathion Technical in the diet were analyzed by high-performance liquid chromatography with ultraviolet detection (HPLC-UV) using a validated method (Charles River Study No. TQC00067DX) and were considered to be acceptable and homogeneous under the conditions of the study. The dietary preparations used for the first exposure were -3.7%, 1.8%, 3.7% and 2.3% of the target concentrations for the 100 ppm, 500 ppm, 5000 ppm and 10000 ppm preparations, respectively. The relative standard deviations for the sample averages from the top, middle and bottom were 0.8%, 3.3%, 4.2% and 2.4% for the 100 ppm, 500 ppm, 5000 ppm and 10000 ppm preparations, respectively. The preparations for weeks 3, 5, 9, and 13 were all within $\pm 10\%$ target specified in the protocol.

The stability of the prepared test substance formulations (diets) bracketing the range of concentrations used on study was determined in Charles River Laboratories study number TQC00067DX. The diets were stable at a concentration range of 40 ppm to 20000 ppm for at least 22 days under room temperature conditions and for at least 22 days under refrigerated conditions ($5 \pm 3^\circ\text{C}$).

4.2. Main Study

4.2.1. Consumed Dosages (Summaries - Tables 1 and 2)

The average daily consumed Malathion Technical dosages (calculated between DSs 1 to 85)^a as well as the highest weekly dosages for the rats in each of the groups are summarized in the following table.

Text Table 14

Dosage Levels (ppm)	Males		Females	
	Exposure Period (calculated as DSs 1-85)	Maximum Weekly Value (Week)	Exposure Period (calculated as DSs 1-85)	Maximum Weekly Value (Week)
100	7.2	11.8 (1)	7.5	10.3 (1)
500	35.0	59.0 (1)	35.9	50.2 (1)
5000	353.6	591.5 (1)	363.1	521.6 (1)
10000	733.8	1071.3 (2)	719.0	931.0 (1)

- a. The rats were exposed to the test substance for at least a 90-day period; however, because of fasting for blood collection the terminal body weight value recorded on the final day of the study could not be used in the calculation of the mean consumed dosage. Therefore, the last non-fasted body weight value that correlated with a feed consumption value was recorded on DS 85, so the mean consumed dosage were calculated using these values.

4.2.2. Mortality and Clinical and Detailed Clinical Observations (Summaries - Tables 3 through 6; Individual Data - Tables 41 through 44)

All male and female rats survived until scheduled euthanasia.

All clinical observations were considered unrelated to exposure to the test substance because: 1) the incidences were not statistically significant or biologically important; 2) the observations occurred in only one or two rats in a particular dosage group; and/or 3) the observations occurred only in the Carrier Control exposure group.

The clinical observations included the following: mild dehydration (based on skin turgor); sparse hair coat on the neck, limbs or back; bent tail; umbilical hernia; localized alopecia on the limbs; chromorhinorrhea; an abrasion on the neck; a scab on the right side of neck, neck, back, mouth, base of tail or the tail; slight excess salivation; swollen right ear, both ears or snout; chromodacryorrhea; missing/broken and/or misaligned incisors; an ulceration on the right side of the neck; lacrimation; ungroomed coat; urine stained abdominal fur; a mass on the lower midline; a torn right ear; and tip of tail red.

4.2.3. Body Weights and Body Weight Changes (Figures 1 and 2; Summaries - Tables 7 through 10; Individual Data - Tables 45 and 46)

4.2.3.1. Male Rats

Mean body weights were marginally reduced in the male rats at 5000 and 10000 ppm during the exposure period (calculated as DSs 1 to 85)^a. Statistical significance ($p \leq 0.01$) was only observed on DS 8 in the male rats at 10000 ppm in comparison with the Carrier Control group value.

Body weight gains were statistically significantly decreased ($p \leq 0.05$) in the male rats at 5000 and 10000 ppm during the exposure period in comparison with the Carrier Control group value. In the male rats at 5000 and 10000 ppm, there were additional instances of statistical significance ($p \leq 0.05$ to $p \leq 0.01$) in decreased body weight gains observed on DSs 1 to 8 and 29 to 36 in comparison with the Carrier Control group values.

Body weights and body weight gains were unaffected by exposure to up to 500 ppm dietary concentrations of Malathion Technical in the male rats. In the 100 ppm exposure group, the body weight gains were statistically significantly decreased ($p \leq 0.05$) in the male rats on DSs 29 to 36 in comparison with the Carrier Control group value. This difference was not considered to be test substance-related because it was a single occurrence that did not persist throughout the exposure period.

a. For the body weights and body weight changes, the exposure period was calculated as DSs 1 to 85. The rats were exposed to the test substance for at least a 90-day period; however, because of fasting for blood collection the terminal body weight value recorded on the final day of the study could not be used in the calculation of the overall body weight change. Therefore, the last non-fasted body weight value was recorded on DS 85, so the mean body weight changes, relative feed consumption value and consumed dosages were calculated using these values.

In the male rats, body weight gains for DSs 1 to 85 at 100, 500, 5000 and 10000 ppm were 93.1%, 92.3%, 83.0% and 84.9%, respectively, as compared with the Carrier Control group value.

4.2.3.2. Female Rats

Mean body weights were marginally reduced in the female rats at 10000 ppm during the exposure period (calculated as DSs 1 to 85).

Body weight gains were statistically significantly decreased ($p \leq 0.01$) in the female rats at 10000 ppm during the exposure period (calculated as DSs 1 to 85) in comparison with the Carrier Control group value. At 10000 ppm, there were additional instances of statistical significance ($p \leq 0.05$ to $p \leq 0.01$) in decreased body weight gains observed on DSs 1 to 8 and 43 to 50 in comparison with the Carrier Control group values.

Body weights and body weight gains were unaffected by exposure to up to 5000 ppm dietary concentrations of Malathion Technical in the female rats. In the 100 ppm exposure group, the body weight gains were statistically significantly decreased ($p \leq 0.01$) in the female rats on DSs 43 to 50 in comparison with the Carrier Control group value. This difference was not considered to be test substance-related because it was a single occurrence that did not persist throughout the exposure period.

Body weight gains in the female rats for DSs 1 to 85 at 100, 500, 5000 and 10000 ppm were 88.1%, 89.2%, 99.8% and 74.6%, respectively, as compared with the Carrier Control group value.

4.2.4. Absolute (g/day) and Relative (g/kg/day) Feed Consumption Values and Feed Efficiency (g body weight gain/g feed consumption/day) (Summaries - Tables 11 through 16; Individual Data - Tables 47 and 48)

4.2.4.1. Male Rats

Absolute feed consumption values were statistically significantly reduced ($p \leq 0.01$) in the male rats during the first week of exposure (DSs 1 to 8) in comparison with the Carrier Control group.

Relative feed consumption values were statistically significantly reduced ($p \leq 0.01$) in the male rats during the first week of exposure in comparison with the Carrier Control group value. The relative feed consumption values were also statistically significantly increased ($p \leq 0.05$ to $p \leq 0.01$) in the male rats at 10000 ppm on DSs 8 to 15 and 15 to 22 in comparison with the Carrier Control group values. These statistically significant increases in relative feed values were related to the decrease in body weight and generally comparable feed consumption values during these intervals.

In the male rats at 5000 and 10000 ppm, feed efficiency was statistically significantly decreased ($p \leq 0.05$ to $p \leq 0.01$) during the exposure period (calculated as DSs 1 to 85) in comparison with the Carrier Control group values. There were additional instances of reduced or statistically significantly reduced ($p \leq 0.05$ to $p \leq 0.01$) feed efficiency values in the male rats at 5000 and 10000 ppm during the first week of exposure (DSs 1 to 8) and on DSs 29 to 36 in comparison with the Carrier Control group values.

Absolute and relative feed consumption values and feed efficiency were unaffected by exposure to up to 500 ppm dietary concentrations of Malathion Technical in the male rats. In the 100 ppm exposure group, the feed efficiency values were statistically significantly reduced ($p \leq 0.05$ to $p \leq 0.01$) in the male rats on DSs 29 to 36 in comparison with the Carrier Control group values. This difference was not considered to be test substance-related because it was not dosage-dependent. Feed efficiency values were also statistically significantly increased ($p \leq 0.01$) in the male rats at 100 and 500 on DSs 64 to 71 in comparison with the Carrier Control group values. These differences were not considered to be test substance-related because they were single occurrences and they did not persist throughout the exposure period. There was also a statistically significantly increased ($p \leq 0.05$) feed efficiency value in the male rats at 10000 ppm on DSs 67 to 71 in comparison with the Carrier Control group values. This statistically significant increase in feed efficiency was related to the decrease in body weight and generally comparable feed consumption values during these intervals and was not considered to be test substance-related because it was an isolated incidence.

4.2.4.2. Female Rats

At 10000 ppm, the absolute feed consumption values were statistically significantly decreased ($p \leq 0.01$) in the female rats during the first week of exposure in comparison with the Carrier Control group value.

In the female rats at 10000 ppm, feed efficiency was statistically significantly decreased ($p \leq 0.01$) during the exposure period (calculated as DSs 1 to 85) in comparison with the Carrier Control group values. There were additional instances of statistically significantly reduced ($p \leq 0.05$ to $p \leq 0.01$) feed efficiency values in the female rats at 10000 ppm during the first week of exposure and on DSs 43 to 50 in comparison with the Carrier Control group values.

Absolute and relative feed consumption values and feed efficiency were unaffected by exposure to up to 5000 ppm dietary concentration of Malathion Technical in the female rats. In the 100 ppm exposure group, the feed efficiency values were statistically significantly decreased ($p \leq 0.05$ to $p \leq 0.01$) in the female rats on DSs 43 to 50 and during the entire exposure period in comparison with the Carrier Control group values. These differences were not considered to be test substance-related because they were not dosage-dependent. There was also a statistically significantly reduced ($p \leq 0.05$) feed efficiency value in the female rats at 5000 ppm on DSs 15 to 22 in comparison with the Carrier Control group value. This difference was not considered to be test substance-related because it was a single occurrence that did not persist.

4.2.5. Necropsy Observations (Summaries - Tables 17 and 18; Individual Data - Tables 49 and 50)

There were no test substance-related necropsy observations in the male or female rats. All necropsy observations were considered unrelated to exposure to Malathion Technical because: 1) the incidences were not dosage-dependent; 2) the observations occurred in only one rat in any exposure group; and/or 3) the observations occurred only in the Carrier Control exposure group. These necropsy observations included numerous red areas on the thymus; red and dark red submandibular lymph nodes; misshapen right lateral lobe of the liver; slight dilation of the pelvis in the right kidney; a constricted area in the spleen; and a mass on the abdominal adipose.

4.2.6. Ophthalmological Evaluations (Appendix 5)

There were no test substance-related adverse ophthalmologic findings after at least 90 days of exposure to Malathion technical via the diet. As only a single female rat in the 5000 ppm exposure group was observed with a retinal degeneration, this observation was not considered to be test substance-related because it was a single occurrence.

4.2.7. Hematology and Clinical Chemistry (Appendix 7)

4.2.7.1. Hematology

4.2.7.1.1. Male Rats

There were marginal differences in the following hematologic parameters of the male rats.

- decreases in the segmented neutrophil counts in all exposure groups (22%, 13%, 19% and 36% decreases, respectively, in comparison with the Carrier Control group value);
- an increased number of lymphocytes in the 500, 5000 and 10000 ppm exposure groups (17%, 20% and 24% increases, respectively, in comparison with the Carrier Control group value);
- an increased number of large unstained cells in the 500, 5000 and 10000 ppm exposure groups (a 20%, 49% and 54% increase, respectively, in comparison with the Carrier Control group value); and
- an increase in the reticulocyte count in the 5000 ppm and 10000 ppm exposure groups (a 12% and 14% increase, respectively, in comparison with the Carrier Control group value).

These marginal changes were not considered to be test substance-related as all values were within the Testing Facility historical control range for each of the parameters and did not appear to be biologically important.

Text Table 15

Dose (ppm):	0 ^a	100	500	5000	10000	HC
Segmented neutrophils (10*3/CMM)	2.32	1.80	2.02	1.88	1.49	0.65 - 3.79
Lymphocytes (10*3/CMM)	7.41	7.43	8.67	8.93	9.16	3.45 - 13.70
Large unstained cells (10*3/CMM)	0.061	0.052	0.073	0.091	0.094	0.010 - 0.260
Reticulocytes (10*9/L)	174.8	174.3	170.7	195.2	198.9	108.70 - 251.90

a. Carrier control

HC = Charles River Ohio historical control 95% spread (2.5% to 97.5%) from 13 to 24 week male rats (30 March 2006 to 30 March 2011).

There were no additional statistically significant or marginally different hematologic changes observed in the male rats in this study.

4.2.7.1.2. Female Rats

There was a statistically significant increase ($p \leq 0.05$) in the mean platelet volume observed in the female rats at 5000 and 10000 ppm in comparison with the Carrier Control group value. In the female rats at 10000 ppm, there was also a statistically significant decrease ($p \leq 0.05$) in the mean corpuscular volume and the mean corpuscular hemoglobin in comparison with the Carrier Control group values. These differences were not considered to be test substance related because: 1) the values were within the 95% spread of the Testing Facility historical control range; and 2) corresponding changes were not observed in the male rats.

There were marginal differences in the following hematologic parameters of the female rats.

- a decrease in the reticulocyte count in the 10000 ppm exposure group (an 11% decrease in comparison with the Carrier Control group value);
- an increased number of leukocytes, lymphocytes and monocytes occurred in the 10000 ppm exposure group (a 24%, 28% and 36% increase, respectively, in comparison with the Carrier Control group values); and
- an increased number of large unstained cells occurred in the 10000 ppm exposure group (a 54% increase in comparison with the Carrier Control group value).

These marginal changes were not considered to be test substance-related as all values were within the 95% spread of the Testing Facility historical control range for each of the parameters and did not appear to be biologically important.

Text Table 16

Dose (ppm):	0 ^a	100	500	5000	10000	HC
Mean platelet volume (FL)	7.8	8.0	8.2	8.4*	8.7*	7.20 - 9.40
Mean corpuscular volume (FL)	55.1	55.7	54.9	54.6	52.9*	48.90 - 58.20
Mean corpuscular hemoglobin (PG)	20.0	19.8	19.5	19.3	18.8*	17.60 - 20.60
Reticulocytes (10 ⁹ /L)	168.6	155.6	173.7	164.6	150.4	89.80 - 223.10
Leukocytes (10 ³ /CMM)	6.84	7.59	6.95	7.13	8.46	3.04 - 13.43
Lymphocytes (10 ³ /CMM)	5.64	5.96	5.82	6.04	7.24	2.35 - 10.88
Monocytes (10 ³ /CMM)	0.14	0.20	0.14	0.13	0.19	0.07 - 0.50
Large unstained cells (10 ³ /CMM)	0.046	0.063	0.050	0.045	0.071	0.010 - 0.170

a. Carrier control

* - ($p \leq 0.05$)

HC = Charles River Ohio historical control 95% spread (2.5% to 97.5%) from 13 to 24 week female rats (30 March 2006 to 30 March 2011).

There were no additional statistically significant or marginally different hematologic changes observed in the female rats in this study.

4.2.7.2. Clinical Chemistry

4.2.7.2.1. Male Rats

In the male rats at 10000 ppm, there was a statistically significant increase ($p \leq 0.05$) in gamma-glutamyltransferase in comparison with the Carrier Control group values.

In the male rats at 5000 and 10000 ppm, there was a statistically significant decrease ($p \leq 0.05$) in aspartate aminotransferase and alkaline phosphatase in comparison with the Carrier Control group values. These differences were not considered to be test substance related because the values were within the 95% spread of the Testing Facility historical control range.

In the male rats at 5000 and 10000 ppm, there was a statistically significant increase ($p \leq 0.05$) in cholesterol in comparison with the Carrier Control group value. This difference was not considered to be test substance-related because the value was within the actual historical control range of values for male rats of comparable ages.

There was also a statistically significant increase ($p \leq 0.05$) in the male rats at 5000 and 10000 ppm in total protein, albumin and globulin in comparison with the Carrier Control group values. In the male rats at 10000 ppm, there was a statistically significant decrease ($p \leq 0.05$) in creatinine in comparison with the Carrier Control group values. These differences were not considered to be test substance related because: 1) the values were within the 95% spread of the Testing Facility historical control range.

In the male rats at 5000 and 10000 ppm, there were decreases in the alanine aminotransferase values (a 28% and 25% decrease, respectively, in comparison with the Carrier Control group value). These differences were not considered to be test substance-related because the values were within the 95% spread of the Testing Facility historical control range. The statistically significant reduction ($p \leq 0.05$) in alkaline phosphatase in the male rats at 100 ppm was not considered test substance-related because the value was not dose-dependent.

Text Table 17

Dose (ppm):	0 ^a	100	500	5000	10000	HC
Aspartate aminotransferase (IU/L)	119	110	109	84*	83*	50.0 - 132.0
Alkaline phosphatase (IU/L)	95	72*	87	72*	66*	49.0 - 174.0
Cholesterol (MG/DL)	64	59	64	96*	118*	23.0 - 171.0 ^b
Total protein (G/DL)	5.78	5.76	5.88	6.28*	6.32*	5.060 - 6.440
Albumin (G/DL)	3.01	2.99	3.04	3.21*	3.21*	2.600 - 3.310
Globulin (G/DL)	2.77	2.78	2.84	3.06*	3.11*	2.310 - 3.380
Gamma-glutamyltransferase (IU/L)	0.00	0.00	0.00	0.00	2.20*	0.000 - 1.050
Creatinine (MG/DL)	0.31	0.28	0.30	0.28	0.25*	0.210 - 0.370
Alanine aminotransferase (IU/L)	32	29	27	23	24	18.0 - 44.0

a. Carrier control

b. Value represents the range of actual historical control values rather than the 95% spread.

* - ($p \leq 0.05$)

HC = Charles River Ohio historical control 95% spread (2.5% to 97.5%) from 13 to 24 week male rats.

4.2.7.2.2. Female Rats

There was an increase or statistically significant increase ($p \leq 0.05$) in the female rats at 5000 and 10000 ppm in gamma-glutamyltransferase in comparison with the Carrier Control group value. There was also a statistically significant decrease ($p \leq 0.05$) in the female rats at 5000 and 10000 ppm in urea nitrogen and creatinine in comparison with the Carrier Control group values. In the female rats at 10000 ppm, there was a statistically significant increase ($p \leq 0.05$) in potassium in comparison with the Carrier Control group value. There was also a statistically significant reduction ($p \leq 0.05$) in the female rats at 10000 ppm in alkaline phosphatase in comparison with the Carrier Control group value. These differences were not considered to be test substance related because: 1) the values were within the 95% spread of the Testing Facility historical control range; and/or 2) corresponding changes were not observed in the male rats.

In the female rats at 10000 ppm, there was a statistically significant increase ($p \leq 0.05$) in cholesterol in comparison with the Carrier Control group value. This difference was not considered to be test substance-related because the value was within the actual historical control range of values for female rats of comparable ages.

The statistically significant increase ($p \leq 0.05$) in potassium in the female rats at 500 ppm was not considered test substance-related because the value was not dose-dependent.

Text Table 18

Dose (ppm):	0 ^a	100	500	5000	10000	HC
Gamma-glutamyltransferase (IU/L)	0.11	0.15	0.11	0.55	0.87*	0.000 – 1.370
Urea nitrogen (MG/DL)	13	13	12	10*	10*	10.0 - 28.0 ^b
Creatinine (MG/DL)	0.37	0.37	0.35	0.31*	0.30*	0.250 – 0.460
Cholesterol (MG/DL)	71	75	74	88	119*	27.0 – 144.0 ^b
Potassium (MMOL/L)	4.12	4.16	4.45*	4.41	4.45*	3.640 – 4.900
Alkaline phosphatase (IU/L)	61	55	43	49	35*	24.0 – 102.0

a. Carrier control

b. Value represents the range of actual historical control values rather than the 95% spread.

* - ($p \leq 0.05$)

HC = Charles River Ohio historical control 95% spread (2.5% to 97.5%) from 13 to 24 week female rats.

4.2.8. Histopathological Evaluations (Appendix 8)

4.2.8.1. Organ Weight Changes

4.2.8.1.1. Male Rats

The relative (% body weight) weight of the liver was statistically significantly increased ($p \leq 0.01$) in the male rats at 5000 ppm in comparison with the Carrier Control group value. In the male rats at 10000 ppm, the absolute and relative (% body weight and % brain weight) weights of the liver and the paired kidneys were statistically significantly increased ($p \leq 0.01$) in comparison with the Carrier Control group values. There were no microscopic findings in the liver or kidney that explained these changes in organ weights.

No other test substance-related organ weight changes were observed in the male exposure groups. In the male rats at 500 ppm, there was a statistically significant increase ($p \leq 0.01$) in the

relative weight (% body weight) of the fixed thyroid lobes/parathyroid in comparison with the Carrier Control group values. There was also a statistically significant decrease ($p \leq 0.05$) in the relative weight (% brain weight) of the paired epididymides in the 5000 ppm male rats in comparison with the Carrier Control group values. These differences were not considered to be test substance-related because they were not dosage-dependent.

In the male rats at 5000 and 10000 ppm, there were statistically significant decreases ($p \leq 0.05$ to $p \leq 0.01$) in the absolute paired epididymides and prostate weights and the relative weight (% brain weight) of the prostate in comparison with the Carrier Control group values. There was also a statistically significant increase ($p \leq 0.01$) in the relative weight (% body weight) of the paired testes in the male rats at 10000 ppm in comparison with the Carrier Control group value. There were no patterns, trends, or correlating data to suggest that these values were toxicologically relevant. Thus, these organ weight differences were considered incidental and/or related to differences unrelated to exposure to Malathion Technical.

Text Table 19

Dose (ppm):	0 ^a	100	500	5000	10000	HC
Liver (g)	15.61	14.49	14.73	16.30	19.96**	16.93 (14.94 – 20.37)
Liver (% Body Weight)	2.489	2.460	2.539	2.986**	3.589**	2.99 (2.49 – 3.37)
Liver (% Brain Weight)	703.6	645.5	682.8	755.0	920.0**	735.50 (641.05 – 887.20)
Kidneys paired (g)	3.57	3.42	3.42	3.31	4.39**	4.06 (3.57 – 4.37)
Kidneys paired (% Body Weight)	0.575	0.580	0.591	0.619	0.794**	0.72 (0.58 – 0.81)
Kidneys paired (% Brain Weight)	160.8	152.1	158.8	153.7	202.7**	176.03 (160.80 – 186.00)
Fixed Thyroid/Parathyroid (% Body Weight) ^b	5.594	5.840	7.848**	7.103	6.594	NA
Epididymides paired (g)	1.61	1.60	1.59	1.41**	1.45*	1.55 (1.52 – 1.61)
Epididymides paired (% Brain Weight)	72.4	71.5	74.0	65.3*	67.1	67.50 (64.39 – 72.40)
Prostate (g)	1.32	1.31	1.12	1.05*	1.03**	NA
Prostate (% Brain Weight)	59.3	58.6	51.7	48.8*	47.2**	NA
Testes paired (% Body Weight)	0.609	0.667	0.632	0.668	0.725**	0.65 (0.61 – 0.73)

a. Carrier control

b. Value was multiplied by 1000.

* - ($p \leq 0.05$) ** - ($p \leq 0.01$)

HC = Charles River Pennsylvania mean historical control value along with the range of the values (presented in parenthesis) for a total of 70 male rats used in 6 comparable 90-day toxicity studies (2004 to 2011).

NA = Testing Facility historical control values from 90-day toxicity studies were not available for comparative purposes.

4.2.8.1.2. Female Rats

Relative to body weight, there was a statistically significant increase ($p \leq 0.01$) in the liver and paired kidney weights observed in the female rats at 10000 ppm in comparison with the Carrier Control group values. There were no microscopic findings in the liver or kidney that explained these changes in organ weights.

No other test substance-related organ weight changes were observed in the female exposure groups. In the female rats at 100 and 500 ppm, there was a statistically significant increase ($p \leq 0.05$) in the relative weight (% body weight) of the fixed thyroid lobes/parathyroid in comparison with the Carrier Control group values. This difference was not considered to be test substance-related because it was not dosage-dependent.

In the female rats at 10000 ppm, there was a statistically significant increase ($p \leq 0.01$) in the relative weight (% body weight) of the brain and a statistically significant decrease ($p \leq 0.05$) in the relative weight (% brain weight) of the lungs in comparison with the Carrier Control group values. There were no patterns, trends, or correlating data to suggest that these values were toxicologically relevant. Therefore, these organ weight differences were considered incidental and/or related to differences unrelated to exposure to Malathion Technical.

Text Table 20

Dose (ppm):	0 ^a	100	500	5000	10000	HC
Liver (% Body Weight)	2.349	2.374	2.436	2.494	3.029**	2.93 (2.349 – 3.222)
Kidneys paired (% Body Weight)	0.574	0.635	0.633	0.640	0.739**	0.75 (0.574 – 0.896)
Fixed Thyroid/Parathyroid (% Body Weight) ^b	7.220	11.390*	10.752*	8.364	8.948	NA
Brain (% Body Weight)	0.591	0.637	0.633	0.588	0.709**	0.72 0.591 – 0.794)
Lungs (% Brain Weight)	66.9	66.7	66.0	65.7	60.2*	NA

a. Carrier control

b. Value was multiplied by 1000.

* - ($p \leq 0.05$) ** - ($p \leq 0.01$)

HC = Charles River Pennsylvania mean historical control value along with the range of the values (presented in parenthesis) for a total of 72 female rats used in 6 comparable 90-day toxicity studies (2004 to 2011).

NA = Testing Facility historical control values from 90-day toxicity studies were not available for comparative purposes.

4.2.8.2. Histopathology

Microscopic findings related to exposure to the test substance were present in the nasal cavity (depletion of goblet cells and olfactory epithelium hyperplasia).

In the rats at 500 ppm, a minimal to mild depletion of goblet cells in the nasal cavity was noted in Nose, Level 2.

Minimal to moderate depletion of the goblet cells was also noted on the nasal septum of Nose, Level 2, in the rats at 5000 and 10000 ppm. Small numbers of cells with abundant non-staining cytoplasm were also interspersed where there was depletion of goblet cells.

Minimal to moderate hyperplasia of olfactory epithelium was also noted at Nose, Levels 3, 4 and 5, and consisted of increased numbers of nuclei. The hyperplasia was judged to be minimal when there was preservation of the nuclear free layer, mild when there was loss of the nuclear free layer and moderate when the olfactory epithelium had no nuclear free layer and the surface of the normally straight lining was undulating and/or contained multiple invaginations forming rosette like structures.

Other microscopic findings observed were considered incidental, of the nature commonly observed in this strain and age of rat, and/or were of similar incidence and severity in control and exposed animals and, therefore, were considered unrelated to exposure to Malathion Technical.

4.2.9. Bone Marrow Evaluations (Appendix 9)

There were no test substance-related effects in the bone marrow associated with exposure to Malathion Technical up to 10000 ppm. M:E ratios and lymphocyte percentages in the male and female rats were similar to control rats on DS 91. The average lymphocyte percentage in female rats exposed to the test substance was minimally higher in comparison with the Carrier Control group rats (39.2% in Carrier Control animals versus 49.5%, 43.9%, 45.6% and 50.8% in female rats exposed to 100, 500, 5000 and 10000 ppm, respectively). This finding was considered to be incidental due to the lack of a dose dependent relationship, no correlative findings in histologic sections of bone marrow examined, no correlative changes in peripheral lymphocyte counts and all exposed individual female values fell within the range of variability in control male and female lymphocyte ranges (20.5% to 77.5%). Although fewer bone marrow smears from female rats were evaluated, there were sufficient numbers for comparison of M:E ratios and lymphocyte percentages to Carrier Control rat values. Additionally, there were no histopathologic abnormalities observed in the bone marrow of male and female rats.

Bone marrow findings observed at the end of the exposure period that were considered unrelated to the test substance included minimal erythroid hypercellularity in one Carrier Control male rat and one male rat exposed to 10000 ppm. There were no correlative changes in any of the hematology parameters and the M:E ratio for the 10000 ppm rat was comparable to the Carrier Control rat. Therefore, both M:E ratios were considered to be incidental.

4.3. Cholinesterase Subset

4.3.1. Consumed Dosages (Summaries - Tables 19 and 20)

The average daily consumed Malathion Technical dosages (calculated between DSs 1 to 91) as well as the highest weekly dosages for the rats in each of the groups are summarized in the following table.

Text Table 21
Mean Consumed Dosages Levels (mg/kg bw/day)

Dosage Levels (ppm)	Males		Females	
	Exposure Period (calculated as DSs 1-91)	Maximum Weekly Value (Week)	Exposure Period (calculated as DSs 1-91)	Maximum Weekly Value (Week)
100	6.2	9.7 (1)	6.6	9.1 (1)
500	31.4	48.4 (1)	33.8	44.7 (1)
5000	311.8	491.4 (1)	335.5	439.7 (1)
10000	635.3	939.5 (1)	680.3	856.0 (2)

4.3.2. Mortality and Clinical and Detailed Clinical Observations (Summaries - Tables 21 through 24; Individual Data - Tables 51 through 54 and 59)

4.3.2.1. Mortality

One male rat at 100 ppm was found dead during the exposure period and another male rat at 500 ppm was humanely euthanized due to adverse clinical signs during the exposure period. These deaths were not considered to be test substance-related because they were isolated incidences and not dosage-dependent. Clinical and necropsy observations, body weights, body weight changes and feed consumption values for these male rats are described below. All other male and female rats survived until scheduled euthanasia.

Rat 3747 in the 100 ppm exposure group was found dead on DS 77. This rat was exposed to the test substance for 76 consecutive days, and had no adverse clinical or detailed clinical observations during the exposure period. Body weight and feed consumption values for this rat were unremarkable. All tissues examined appeared normal at necropsy for the moderate degree of autolysis.

Rat 3819 in the 500 ppm exposure group was humanely euthanized on DS 86 due to adverse clinical signs. This rat was exposed to the test substance for 86 consecutive days. The adverse clinical signs noted for this rat on DS 86 included vocalization to touch, chromorhinorrhea, chromodacryorrhea, missing/broken incisors, red perioral substance, dyspnea, and a broken palate. Body weight and feed consumption values for this rat were unremarkable. The chromorhinorrhea, chromodacryorrhea, missing/broken incisors, red perioral substance and the broken palate were all confirmed at necropsy; all other tissues examined appeared normal.

4.3.2.2. Clinical and Detailed Clinical Observations

All clinical and detailed clinical observations were considered unrelated to exposure to the test substance because: 1) the incidences were not statistically significant or biologically important; 2) the observations occurred in only one or two rats in a particular dosage group; and/or 3) the observations occurred only in the Carrier Control exposure group. The clinical observations included the following: bent tail; missing/broken and/or misaligned incisors; chromodacryorrhea; urine-stained abdominal fur (in the male rats); mild dehydration; chromorhinorrhea; localized alopecia on the limbs; an abrasion on the neck; swollen head, right and/or left ear or right forepaw; scab on the head, neck, right ear, back and/or tail; sparse hair coat on the neck, limbs, back or underside; vocalization to touch; red perioral substance; broken palate; dyspnea; soft or liquid feces; lacrimation; ungroomed coat; laceration on the mouth; ulceration on the head or mouth; abrasion on the tail or mouth; scant feces; exophthalmos; slight excess salivation; dark red right and/or left ear and swollen snout.

There were a statistically significantly decreased ($p \leq 0.01$) number of male rats at 100, 5000 and 10000 ppm observed with sparse hair coat (total amount observed and observed on the limbs) during the exposure period in comparison with the Carrier Control group. This decrease was not considered to be test substance-related because an increase rather than a decrease would be considered biologically important. A statistically significantly increased ($p \leq 0.01$) number of female rats at 10000 ppm were observed with urine-stained abdominal fur during the clinical and detailed clinical observations as compared with the Carrier Control group. This increase was considered non-adverse because it was not observed in the male rats in either the main study or cholinesterase subset or the female rats assigned to the main study.

4.3.3. Body Weights and Body Weight Changes (Figures 3 and 4; Summaries - Tables 25 through 28; Individual Data - Tables 55 and 56)

4.3.3.1. Male Rats

In the male rats at 5000 ppm, the mean body weights were statistically significantly decreased ($p \leq 0.05$) on DS 85 in comparison with the Carrier Control group value. The mean body weights were also statistically significantly decreased ($p \leq 0.01$) at all intervals during the exposure period in the male rats at 10000 ppm in comparison with the Carrier Control group value.

The body weight gains were decreased or statistically significantly decreased ($p \leq 0.01$) in the male rats at 5000 and 10000 ppm for the entire exposure period (calculated as DSs 1 to 91) in comparison with the Carrier Control group value. In the male rats at 5000 and/or 10000 ppm, there were additional instances of statistically significantly reduced ($p \leq 0.05$ to $p \leq 0.01$) body weight gains observed on DSs 1 to 8, 15 to 22, 22 to 29, 43 to 50 and 78 to 85 in comparison with the Carrier Control group values.

Body weights and body weight gains were unaffected by exposure to up to 500 ppm dietary concentrations of Malathion Technical in the male rats in the cholinesterase subset. In the 500 ppm exposure group, the body weight gain was statistically significantly increased ($p \leq 0.01$)

in the male rats on DSs 57 to 64 in comparison with the Carrier Control group value. This difference was not considered to be test substance-related because it was not dosage-dependent. Body weight gains were also statistically significantly increased ($p \leq 0.01$) in the male rats at 500, 5000 and 10000 ppm on DSs 85 to 91 in comparison with the Carrier Control group values. These differences were not considered to be test substance-related because they were single occurrences and the body weight increase was not considered adverse.

In the male rats, body weight gains for the entire exposure period (calculated as DSs 1 to 91) at 100, 500, 5000 and 10000 ppm were 100.2%, 106.0%, 91.4% and 83.7%, respectively, as compared with the Carrier Control group value.

4.3.3.2. Female Rats

In the female rats at 10000 ppm, body weight gains were statistically significantly decreased ($p \leq 0.01$) during the first week of exposure (calculated as DSs 1 to 8) in comparison with the Carrier Control group values

Body weights and body weight gains were unaffected by exposure to up to 5000 ppm dietary concentrations of Malathion Technical in the female rats. Body weight gains in the female rats for the entire exposure period at 100, 500, 5000 and 10000 ppm were 100.2%, 106.1%, 99.1% and 89.9%, respectively, as compared with the Carrier Control group value.

4.3.4. Absolute (g/day) and Relative (g/kg/day) Feed Consumption Values and Feed Efficiency (g body weight gain/g feed consumption/day) (Summaries - Tables 29 through 34; Individual Data - Tables 57 and 58)

4.3.4.1. Male Rats

Absolute feed consumption values were statistically significantly reduced ($p \leq 0.01$) in the male rats at 10000 ppm during the exposure period (calculated as DSs 1 to 91). In the male rats at 10000 ppm, marginally reduced or statistically significantly reduced ($p \leq 0.05$ to $p \leq 0.01$) absolute feed consumption values were also observed at all intervals during the exposure period in comparison with the Carrier Control group value.

At 10000 ppm, the relative feed consumption values were statistically significantly increased ($p \leq 0.01$) in the male rats on DSs 8 to 15, 36 to 43, 71 to 78 and 78 to 85 in comparison with the Carrier Control group values.

In the male rats at 5000 and 10000 ppm, feed efficiency was statistically significantly decreased ($p \leq 0.05$ to $p \leq 0.01$) during the entire exposure period (DSs 1 to 91) in comparison with the Carrier Control group values. Feed efficiency values were also statistically significantly decreased ($p \leq 0.05$ to $p \leq 0.01$) in the male rats at 5000 and 10000 ppm on DSs 1 to 8, 22 to 29, 43 to 50 and 78 to 85 in comparison with the Carrier Control group values. In the male rats at 10000 ppm, the feed efficiency value was also statistically significantly decreased ($p \leq 0.05$) at DSs 15 to 22 in comparison with the Carrier Control group value.

Absolute and relative feed consumption values and feed efficiency were unaffected by exposure to up to 500 ppm dietary concentrations of Malathion Technical in the male rats. In the male rats at 100 ppm, there was a statistically significant increase ($p \leq 0.05$) in the relative feed consumption value on DSs 36 to 43 and the feed efficiency value on DSs 78 to 85 in

comparison with the Carrier Control group value. There was also a statistically significant increase ($p \leq 0.05$) in the absolute feed consumption value in the male rats at 500 ppm on DSs 78 to 85 in comparison with the Carrier Control group value. At 500 and 5000 ppm, the relative feed consumption values were statistically significantly increased ($p \leq 0.01$) at DSs 78 to 85 in comparison with the Carrier Control group value. In the male rats at 500 ppm, the feed efficiency value was also statistically significantly increased ($p \leq 0.01$) on DSs 57 to 64 in comparison with the Carrier Control group value. These differences were not considered to be test substance-related because they were not dosage-dependent. Feed efficiency values were also statistically significantly increased ($p \leq 0.01$) in the male rats at 500, 5000 and 10000 ppm on DSs 85 to 91 in comparison with the Carrier Control group values. These differences were not considered to be test substance-related because: 1) they were not dosage-dependent; 2) they were single occurrences and they did not persist throughout the exposure period.

4.3.4.2. Female Rats

The absolute and relative feed consumption values and feed efficiency were statistically significantly decreased ($p \leq 0.01$) in the female rats at 10000 ppm during the first week of exposure (DSs 1 to 8) in comparison with the Carrier Control group values.

Absolute and relative feed consumption values and feed efficiency were unaffected by exposure to up to 5000 ppm dietary concentrations of Malathion Technical in the female rats.

4.3.5. Necropsy Observations (Summaries - Tables 35 and 36; Individual Data - Tables 59 and 60)

There were no test substance-related necropsy observations in the male or female rats. All necropsy observations were considered unrelated to exposure to Malathion Technical because: 1) the incidences were not dosage-dependent; and/or 2) the observations occurred in only one rat in any exposure group. These necropsy observations included a dark red thymus and slight dilation of the pelvis in the right kidney.

4.3.6. Brain Cholinesterase Activity (Summaries - Tables 37 and 38; Individual Data - Tables 61 and 62)

As summarized in Text Table 22, male and female rats at dosages of 5000 and 10000 ppm had statistically significantly reduced ($p \leq 0.01$) brain cholinesterase activity as compared with the carrier control group values.

Text Table 22
Malathion Technical Brain Cholinesterase Activity

Group	Dosage (ppm)	Mean ChE ChE U/G \pm S.D. (n)	Percent Inhibition Compared with Controls
Male Rats			
I	0 (Carrier Control)	14.573 \pm 0.878 (14) ^a	--
II	100	14.963 \pm 0.791 (14) ^b	c
III	500	14.505 \pm 0.537 (14) ^b	0.5%
IV	5000	12.049 \pm 0.635 (14) ^{a**}	17.3%
V	10000	11.936 \pm 1.019 (15) ^{**}	18.1%
Female Rats			
I	0 (Carrier Control)	14.540 \pm 0.775 (15)	--
II	100	14.893 \pm 0.573 (15)	c
III	500	14.204 \pm 0.826 (15)	2.3%
IV	5000	11.382 \pm 0.877 (15) ^{**}	21.7%
V	10000	7.341 \pm 1.806 (15) ^{**}	49.5%

n = The number of rats evaluated for cholinesterase activity.

a. Excludes values for rats with questionable brain weights.

b. Excludes rats that were found dead or euthanized due to adverse clinical observations.

c. No inhibition occurred; values were greater than the Carrier Control group value.

** Significantly different from the Carrier Control group value ($p \leq 0.01$).

4.3.7. Red Blood Cell (RBC) Cholinesterase Activity (Summaries - Tables 39 and 40; Individual Data - Tables 63 and 64)

As summarized in Text Table 23, female rats had statistically significantly reduced ($p \leq 0.05$ to $p \leq 0.01$) RBC cholinesterase levels in all exposure groups, while the male rats had statistically significantly reduced ($p \leq 0.01$) RBC cholinesterase levels in the 500, 5000 and 10000 ppm exposure groups in comparison with the Carrier Control group values.

Text Table 23
Malathion Technical RBC Cholinesterase Activity

Group	Dosage (ppm)	Mean ChE ChE U/mL \pm S.D. (n)	Percent Inhibition Compared with Controls
Male Rats			
I	0 (Carrier Control)	1.756 \pm 0.172 (14) ^a	--
II	100	1.626 \pm 0.219 (13) ^{a,b}	7.4%
III	500	1.469 \pm 0.275 (12) ^{a-c**}	16.3%
IV	5000	0.476 \pm 0.195 (14) ^{a**}	72.9%
V	10000	0.255 \pm 0.104 (9) ^{a,c,d**}	85.5%
Female Rats			
I	0 (Carrier Control)	1.700 \pm 0.146 (15)	--
II	100	1.527 \pm 0.165 (15) [*]	10.2%
III	500	1.367 \pm 0.293 (15) ^{**}	19.6%
IV	5000	0.353 \pm 0.111 (14) ^{c**}	79.2%
V	10000	0.244 \pm 0.145 (13) ^{d**}	85.6%

n = The number of rats evaluated for cholinesterase activity.

a. Excludes rats that did not have an RBC sample analyzed.

b. Excludes rats that were found dead or euthanized due to adverse clinical observations.

c. Excludes values for rats that had a sample that was improperly labeled.

d. Excludes rats that had values that did not meet the acceptability or reproducibility criteria.

e. Excludes values for rat 3972, which had a questionable value.

* Significantly different from the Carrier Control group value ($p \leq 0.05$).

** Significantly different from the Carrier Control group value ($p \leq 0.01$).

4.3.8. Benchmark Dose Modeling (Appendix 10)

Benchmark dose (BMD) modeling was applied to the data using an exponential model recommended by the U.S. EPA, which provided an adequate fit to the data. The estimated dosage level for a 20% inhibition (BMD₂₀) of RBC cholinesterase activity was 48.7 mg/kg bw/day for male rats and 42.0 mg/kg bw/day for female rats. The lowest BMDL₂₀ value (lower 95th percentile confidence limit) was 41.0 mg/kg bw/day for male rats and 34.5 mg/kg bw/day for female rats. For the brain cholinesterase, the estimated dosage level for a 10% inhibition (BMD₁₀) was estimated to be 174.6 mg/kg bw/day for male rats and 118.4 mg/kg bw/day for female rats. The lowest BMDL₁₀ value for brain cholinesterase was 132.0 mg/kg bw/day for male rats and 103.3 mg/kg bw/day for female rats.

5. DISCUSSION AND CONCLUSION

One hundred twenty five male rats and 125 female rats were assigned to five dosage groups (10 rats/sex/dosage group assigned to the main study and 15 rats/sex/dosage group were assigned to the cholinesterase subset). Rats were exposed to Malathion technical at concentrations corresponding to target doses of 0 (Carrier Control) ppm, 100 ppm, 500 ppm, 5000 ppm, and 10000 ppm (Groups I through V, respectively) for 90 consecutive days.

Repeated oral exposure to Malathion technical via the diet at exposure levels as high as 10000 ppm for 90 consecutive days did not cause any adverse clinical signs in male or female rats. There were also no test substance-related adverse observations apparent during the ophthalmologic examinations, necropsy evaluations, hematology or clinical chemistry changes or bone marrow evaluations.

Concentrations of 5000 and 10000 ppm produced reductions in body weight and body weight gains and reductions in absolute and relative feed consumption values and feed efficiency. The decreased feed consumption and body weights during the first week of exposure may have indicated an initial taste aversion of the Malathion technical in the diet. The differences during the first week of exposure may have resulted in the overall body weight changes that occurred because the reductions occurred during the growth period.

At 5000 and 10000 ppm, there were organ weight increases in the liver and kidneys in both male and female rats at 10000 ppm. There was also an increase in the gamma-glutamyltransferase levels in the male rats at 10000 ppm. These increases are considered to reflect the metabolic changes occurring in the rats resulting from the continual exposure to Malathion technical. They were not considered to be adverse as they did not appear to produce any microscopic findings in either organ. Microscopic findings were present in the nasal cavity of the 500 ppm (depletion of goblet cells), and the 5000 and 10000 ppm exposure groups (depletion of goblet cells and olfactory epithelial hyperplasia) in both the male and female rats. These local findings are considered to be the result of continued nasal exposure to Malathion technical in the diet.

Based on the results of this study, the no-observed-adverse-effect-level (NOAEL) for general toxicity was 100 ppm. Red blood cell cholinesterase inhibition was observed at all exposure groups in the female rats and at the 500 and greater exposure groups in the male rats. The reduction observed in the female rats at 100 ppm was considered minor (10.2% inhibition compared with controls) and not toxicologically relevant.

Based on benchmark dose (BMD) modeling, the estimated dosage level for a 20% inhibition (BMD₂₀) of RBC cholinesterase activity was 48.7 mg/kg bw/day for male rats and 42.0 mg/kg bw/day for female rats. The lowest BMDL₂₀ value (lower 95th percentile confidence limit) was 41.0 mg/kg bw/day for male rats and 34.5 mg/kg bw/day for female rats. For the brain cholinesterase, the estimated dosage level for a 10% inhibition (BMD₁₀) was estimated to be 174.6 mg/kg bw/day for male rats and 118.4 mg/kg bw/day for female rats. The lowest BMDL₁₀ value for brain cholinesterase was 132.0 mg/kg bw/day for male rats and 103.3 mg/kg bw/day for female rats.

6. REFERENCES

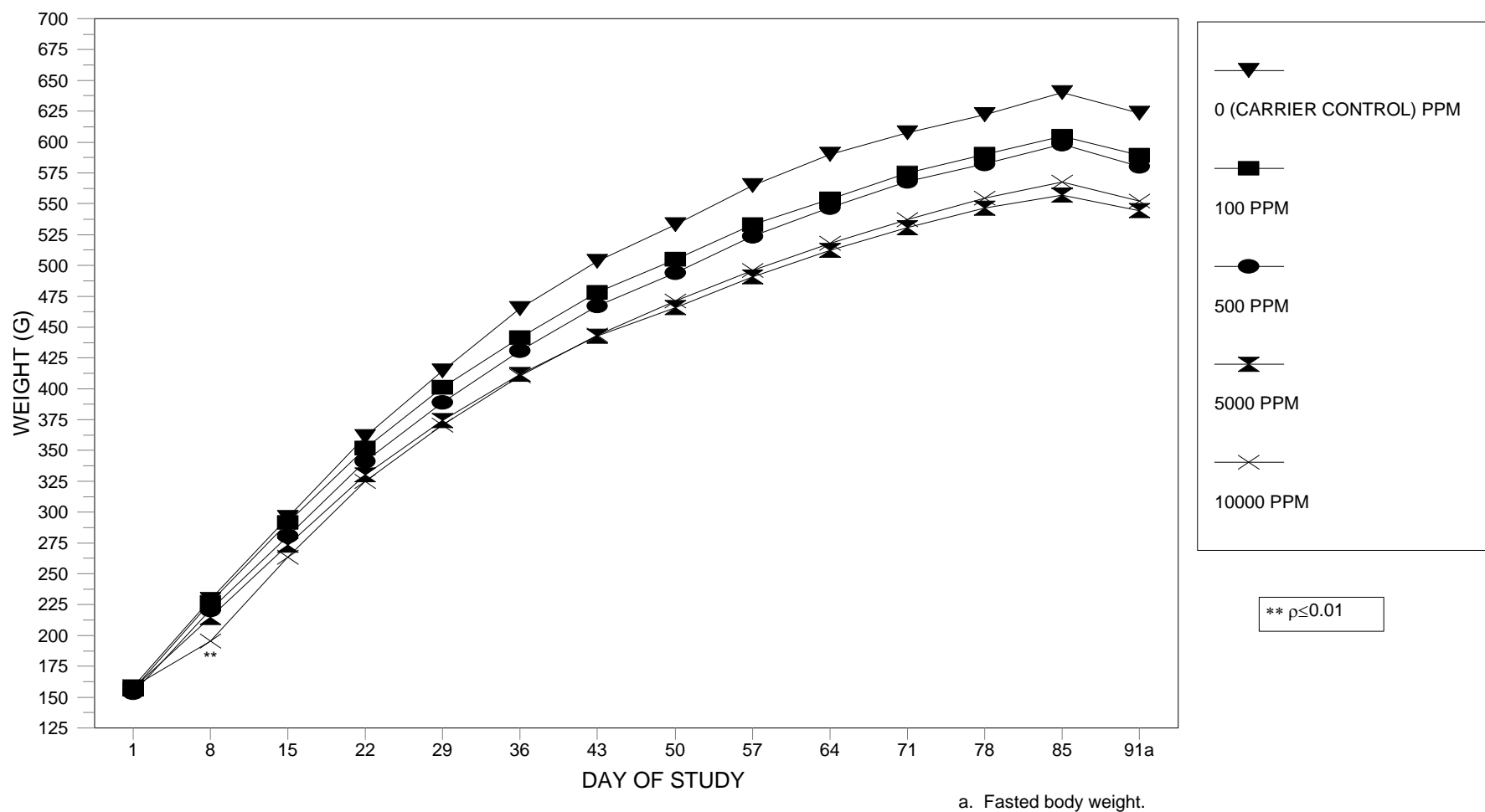
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PROTOCOL TQC00066 : ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

BODY WEIGHTS - MALE RATS - MAIN STUDY

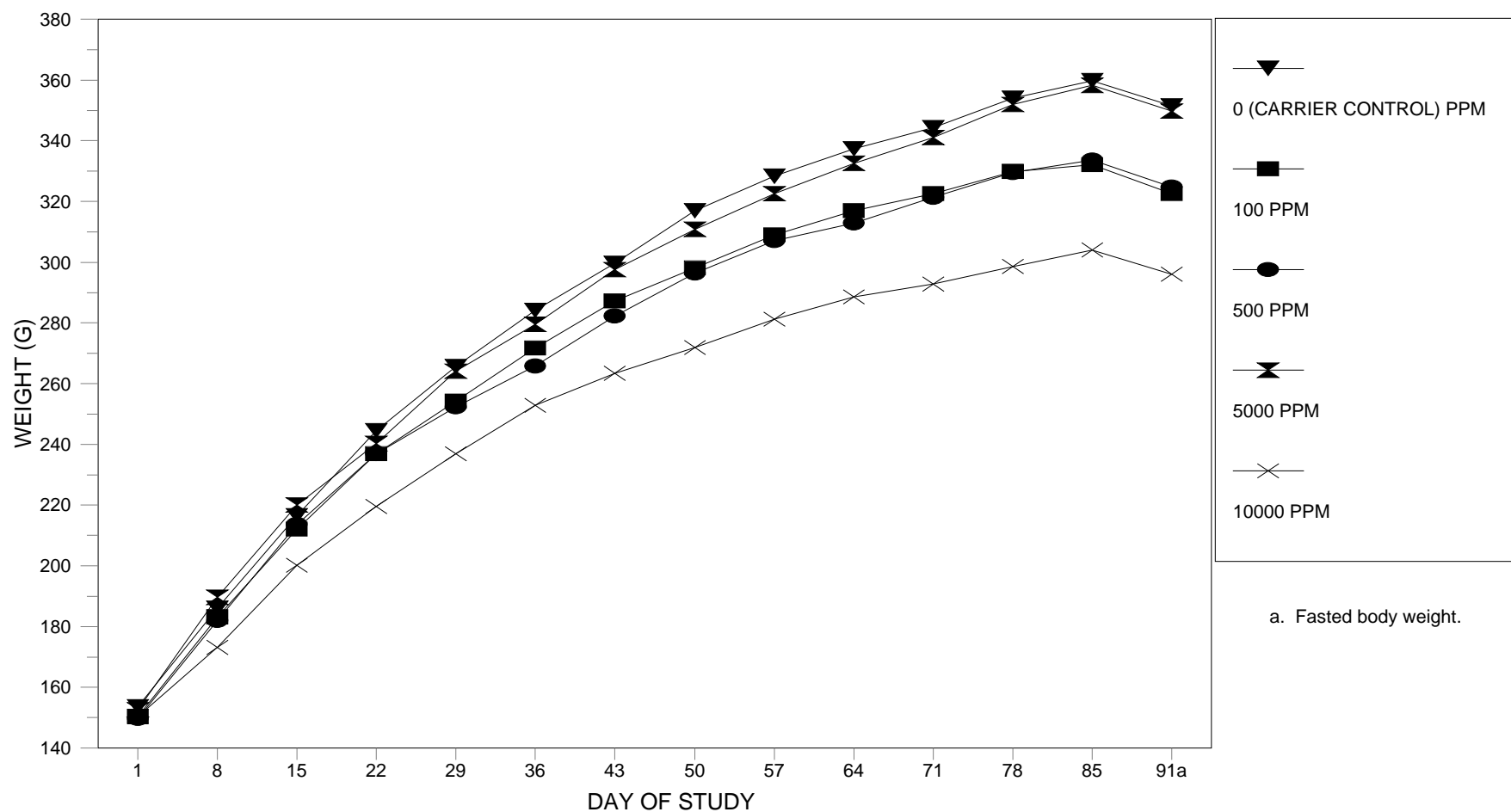
Figure 1



PROTOCOL TQC00066 : ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

BODY WEIGHTS - FEMALE RATS - MAIN STUDY

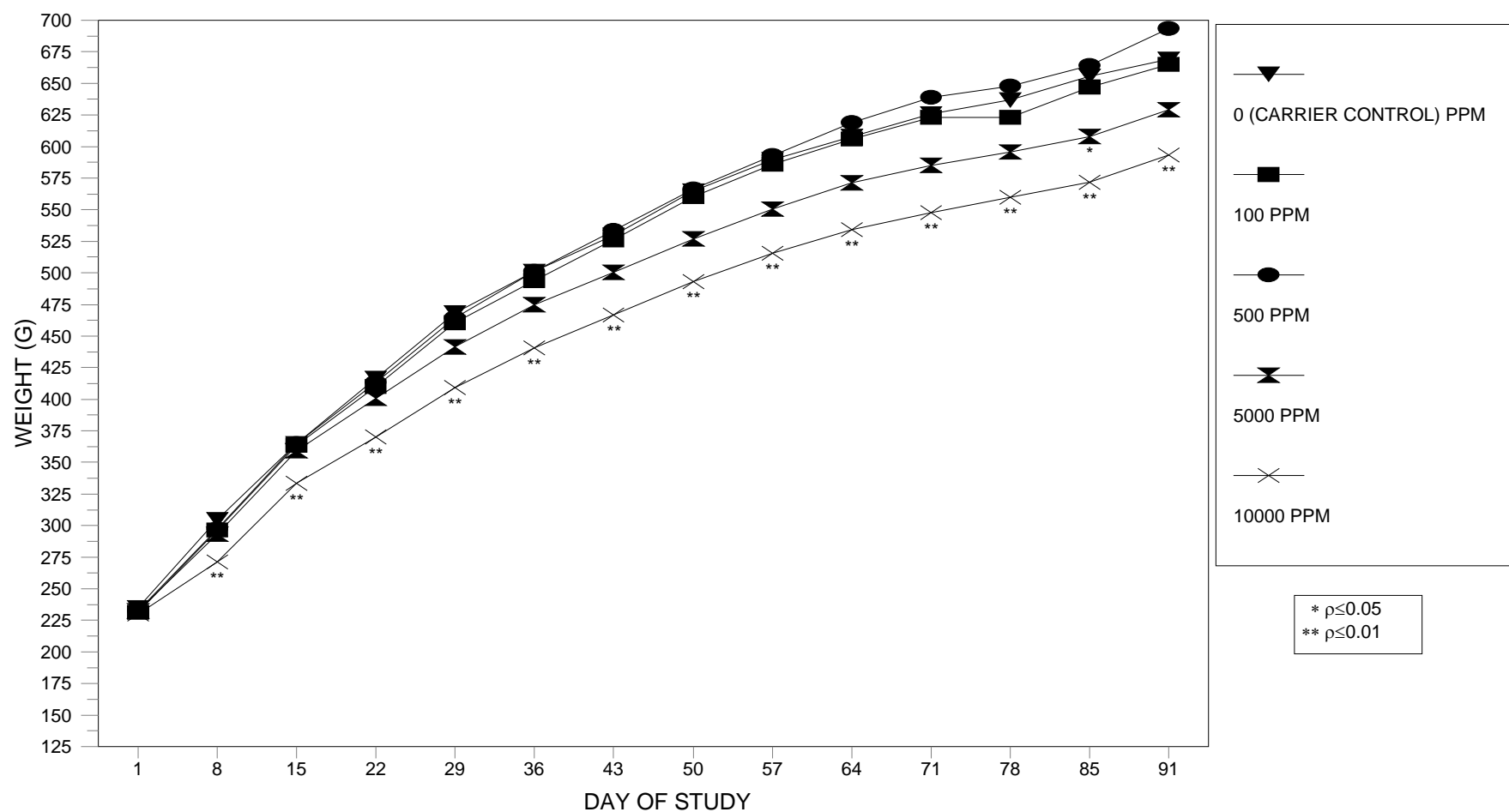
Figure 2



PROTOCOL TQC00066 : ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

BODY WEIGHTS - MALE RATS - CHOLINESTERASE SUBSET

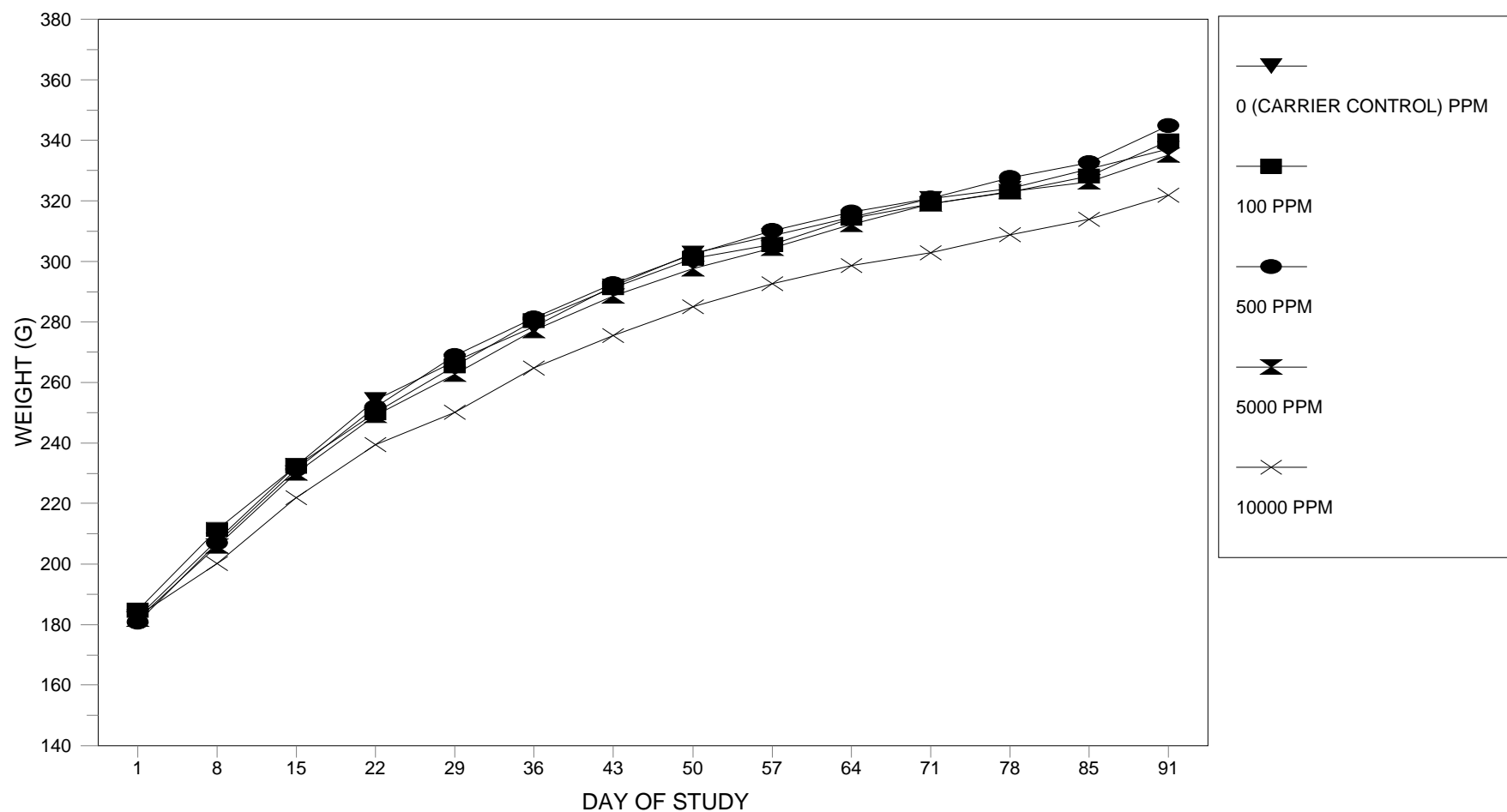
Figure 3



PROTOCOL TQC00066 : ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

BODY WEIGHTS - FEMALE RATS - CHOLINESTERASE SUBSET

Figure 4



PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 1 (PAGE 1): CONSUMED DOSAGES (MG/KG/DAY) - SUMMARY - MALE RATS - MAIN STUDY

DOSAGE GROUP CONCENTRATION (PPM) a		I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS TESTED		10	10	10	10	10
DIETARY DOSAGE (MG/KG/DAY)						
DAYS 1 - 8	MEAN±S.D.	0.0 ± 0.0	11.8 ± 0.6	59.0 ± 2.7	591.5 ± 28.3	1055.2 ± 102.8
DAYS 8 - 15	MEAN±S.D.	0.0 ± 0.0	9.5 ± 0.5	47.2 ± 2.9	495.0 ± 24.8	1071.3 ± 66.6
DAYS 15 - 22	MEAN±S.D.	0.0 ± 0.0	7.9 ± 0.5	39.4 ± 2.9	406.8 ± 29.5	[9]b 857.3 ± 32.3
DAYS 22 - 29	MEAN±S.D.	0.0 ± 0.0	7.2 ± 0.4	35.4 ± 1.6	363.9 ± 25.1	753.4 ± 29.7
DAYS 29 - 36	MEAN±S.D.	0.0 ± 0.0	6.4 ± 0.3	30.7 ± 1.7	313.2 ± 22.4	642.2 ± 23.6
DAYS 36 - 43	MEAN±S.D.	0.0 ± 0.0	6.0 ± 0.4	28.8 ± 1.0	286.2 ± 16.2	598.4 ± 19.4
DAYS 43 - 50	MEAN±S.D.	0.0 ± 0.0	5.4 ± 0.3	26.1 ± 1.1	263.0 ± 15.2	549.2 ± 24.4
DAYS 50 - 57	MEAN±S.D.	0.0 ± 0.0	5.0 ± 0.3	24.6 ± 1.2	244.8 ± 18.1	508.1 ± 25.7
DAYS 57 - 64	MEAN±S.D.	0.0 ± 0.0	4.7 ± 0.4	23.7 ± 1.4	239.8 ± 18.1	491.9 ± 32.9
DAYS 64 - 71	MEAN±S.D.	0.0 ± 0.0	4.6 ± 0.3	22.8 ± 1.0	227.8 ± 13.4	470.4 ± 21.7
DAYS 71 - 78	MEAN±S.D.	0.0 ± 0.0	4.5 ± 0.5	21.2 ± 0.7	217.2 ± 13.9	447.5 ± 26.0
DAYS 78 - 85	MEAN±S.D.	0.0 ± 0.0	4.3 ± 0.2	20.8 ± 1.3	207.6 ± 12.6	436.5 ± 28.9
DAYS 1 - 85	MEAN±S.D.	0.0 ± 0.0	7.2 ± 0.3	35.0 ± 1.4	353.6 ± 16.6	733.8 ± 21.6

DAYS = DAYS OF STUDY

[] = NUMBER OF VALUES AVERAGED

a. Rats were given continual access to the carrier control or test substance in the diet.

b. Excludes a value that appeared incorrectly recorded.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 2 (PAGE 1): CONSUMED DOSAGES (MG/KG/DAY) - SUMMARY - FEMALE RATS - MAIN STUDY

DOSAGE GROUP CONCENTRATION (PPM) a		I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS TESTED	N	10	10	10	10	10
DIETARY DOSAGE (MG/KG/DAY)						
DAYS 1 - 8	MEAN±S.D.	0.0 ± 0.0	10.3 ± 1.1	50.2 ± 3.6	521.6 ± 51.3	931.0 ± 73.9
DAYS 8 - 15	MEAN±S.D.	0.0 ± 0.0	8.6 ± 2.3	38.7 ± 8.4	405.0 ± 112.2	715.5 ± 234.2
DAYS 15 - 22	MEAN±S.D.	0.0 ± 0.0	8.1 ± 1.8	39.3 ± 3.0	408.2 ± 33.2	773.2 ± 54.2
DAYS 22 - 29	MEAN±S.D.	0.0 ± 0.0	7.1 ± 2.9	36.8 ± 2.0	396.3 ± 111.6	737.1 ± 57.8
DAYS 29 - 36	MEAN±S.D.	0.0 ± 0.0	7.5 ± 1.4	34.3 ± 2.3	333.4 ± 17.0	671.8 ± 34.8
DAYS 36 - 43	MEAN±S.D.	0.0 ± 0.0	7.1 ± 1.3	33.0 ± 1.7	326.8 ± 16.0	634.9 ± 35.7
DAYS 43 - 50	MEAN±S.D.	0.0 ± 0.0	6.4 ± 0.9	30.8 ± 1.8	307.5 ± 18.9	602.8 ± 43.9
DAYS 50 - 57	MEAN±S.D.	0.0 ± 0.0	5.8 ± 0.6	28.3 ± 1.7	279.1 ± 19.0	567.6 ± 58.0
DAYS 57 - 64	MEAN±S.D.	0.0 ± 0.0	5.6 ± 0.6	26.3 ± 1.9	265.9 ± 13.8	541.9 ± 59.5
DAYS 64 - 71	MEAN±S.D.	0.0 ± 0.0	5.4 ± 0.4	26.5 ± 1.6	248.0 ± 28.7	532.1 ± 57.6
DAYS 71 - 78	MEAN±S.D.	0.0 ± 0.0	5.2 ± 0.4	25.3 ± 2.1	251.0 ± 17.5	557.7 ± 90.3
DAYS 78 - 85	MEAN±S.D.	0.0 ± 0.0	5.0 ± 0.4	24.1 ± 2.0	236.6 ± 22.0	540.5 ± 97.9
DAYS 1 - 85	MEAN±S.D.	0.0 ± 0.0	7.5 ± 1.0	35.9 ± 1.7	363.1 ± 24.4	719.0 ± 58.6

DAYS = DAYS OF STUDY

a. Rats were given continual access to the carrier control or test substance in the diet.

b. Excludes values that were not recorded, as well as those associated with spillage.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 3 (PAGE 1): CLINICAL OBSERVATIONS - SUMMARY - MALE RATS - MAIN STUDY

DOSAGE GROUP CONCENTRATION (PPM) ^a	I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
MAXIMUM POSSIBLE INCIDENCE	910/ 10	910/ 10	910/ 10	910/ 10	910/ 10
MORTALITY	0	0	0	0	0
SPARSE HAIR COAT: TOTAL	0/ 0	23/ 1	3/ 1	17/ 1	10/ 1
NECK	0/ 0	0/ 0	3/ 1	0/ 0	0/ 0
LIMB(S)	0/ 0	23/ 1	0/ 0	17/ 1	10/ 1
TAIL: BENT	0/ 0	0/ 0	0/ 0	58/ 1	89/ 1
UMBILICAL HERNIA	0/ 0	0/ 0	0/ 0	0/ 0	59/ 1
LOCALIZED ALOPECIA: LIMB(S)	0/ 0	19/ 1	68/ 1	0/ 0	0/ 0
CHROMORHINORRHEA	4/ 1	0/ 0	1/ 1	0/ 0	0/ 0
NECK: ABRASION	0/ 0	0/ 0	19/ 1	0/ 0	0/ 0
NECK: SCAB	0/ 0	0/ 0	2/ 1	0/ 0	0/ 0
EXCESS SALIVATION - SLIGHT	0/ 0	0/ 0	2/ 1	0/ 0	0/ 0
RIGHT EAR: SWOLLEN	0/ 0	0/ 0	1/ 1	0/ 0	0/ 0
CHROMODACRYORRHEA	0/ 0	20/ 2	0/ 0	0/ 0	0/ 0
INCISOR(S): MISSING/BROKEN	8/ 1	0/ 0	0/ 0	0/ 0	0/ 0

STATISTICAL ANALYSES OF CLINICAL OBSERVATION DATA WERE RESTRICTED TO THE NUMBER OF RATS WITH OBSERVATIONS.

MAXIMUM POSSIBLE INCIDENCE = (DAYS x RATS)/NUMBER OF RATS EXAMINED PER GROUP

N/N = TOTAL NUMBER OF OBSERVATIONS/NUMBER OF RATS WITH OBSERVATION

a. Rats were given continual access to the carrier control or test substance in the diet.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 4 (PAGE 1): DETAILED CLINICAL OBSERVATIONS - SUMMARY - MALE RATS - MAIN STUDY

DOSAGE GROUP CONCENTRATION (PPM) ^a	I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
MAXIMUM POSSIBLE INCIDENCE	140/ 10	140/ 10	140/ 10	140/ 10	140/ 10
MORTALITY	0	0	0	0	0
DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL	125/ 10	109/ 10	108/ 10	120/ 10	107/ 9
DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL	6/ 3	21/ 4	22/ 4	10/ 1	23/ 2
TAIL: BENT	0/ 0	7/ 1	0/ 0	10/ 1	13/ 1
UMBILICAL HERNIA	0/ 0	0/ 0	0/ 0	0/ 0	10/ 1
RIGHT SIDE OF NECK, NECK OR BACK: SCAB	1/ 1	0/ 0	3/ 2	0/ 0	0/ 0
SPARSE HAIR COAT: LIMB(S)	0/ 0	7/ 1	2/ 1	0/ 0	0/ 0
LOCALIZED ALOPECIA: LIMB(S)	0/ 0	6/ 1	7/ 1	0/ 0	0/ 0
BOTH EARS: SWOLLEN	0/ 0	0/ 0	8/ 1	0/ 0	0/ 0
RIGHT SIDE OF NECK: ULCERATION	0/ 0	0/ 0	1/ 1	0/ 0	0/ 0
CHROMODACRYORRHEA	1/ 1	4/ 2	0/ 0	0/ 0	0/ 0
CHROMORHINORRHEA	1/ 1	1/ 1	0/ 0	0/ 0	0/ 0
LACRIMATION	1/ 1	1/ 1	0/ 0	0/ 0	0/ 0
UNGROOMED COAT	1/ 1	0/ 0	1/ 1	0/ 0	0/ 0
INCISOR(S): MISSING/BROKEN	2/ 1	0/ 0	0/ 0	0/ 0	0/ 0

STATISTICAL ANALYSES OF DETAILED CLINICAL OBSERVATION DATA WERE RESTRICTED TO THE NUMBER OF RATS WITH OBSERVATIONS.

MAXIMUM POSSIBLE INCIDENCE = (WEEKS x RATS)/NUMBER OF RATS EXAMINED PER GROUP

N/N = TOTAL NUMBER OF OBSERVATIONS/NUMBER OF RATS WITH OBSERVATION

a. Rats were given continual access to the carrier control or test substance in the diet.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 5 (PAGE 1): CLINICAL OBSERVATIONS - SUMMARY - FEMALE RATS - MAIN STUDY

DOSAGE GROUP CONCENTRATION (PPM) ^a	I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
MAXIMUM POSSIBLE INCIDENCE	910/ 10	910/ 10	910/ 10	910/ 10	910/ 10
MORTALITY	0	0	0	0	0
SPARSE HAIR COAT: LIMB(S)	14/ 1	15/ 1	64/ 1	0/ 0	46/ 1
CHROMORHINORRHEA	0/ 0	0/ 0	0/ 0	1/ 1	3/ 1
URINE-STAINED ABDOMINAL FUR	0/ 0	0/ 0	0/ 0	0/ 0	13/ 1
INCISOR(S): TOTAL	3/ 1	0/ 0	0/ 0	48/ 2	0/ 0
MISSING/BROKEN	3/ 1	0/ 0	0/ 0	20/ 2	0/ 0
MISALIGNED	0/ 0	0/ 0	0/ 0	28/ 1	0/ 0
CHROMODACRYORRHEA	0/ 0	4/ 1	3/ 1	11/ 1	0/ 0
TAIL: BENT	0/ 0	77/ 1	0/ 0	61/ 1	0/ 0
LOWER MIDLINE: MASS	0/ 0	0/ 0	0/ 0	34/ 1	0/ 0
NECK: SCAB	0/ 0	0/ 0	5/ 1	0/ 0	0/ 0
LOCALIZED ALOPECIA: LIMB(S)	14/ 1	7/ 1	0/ 0	0/ 0	0/ 0
BOTH EARS: SWOLLEN	0/ 0	14/ 1	0/ 0	0/ 0	0/ 0
SNOUT: SWOLLEN	3/ 1	0/ 0	0/ 0	0/ 0	0/ 0

STATISTICAL ANALYSES OF CLINICAL OBSERVATION DATA WERE RESTRICTED TO THE NUMBER OF RATS WITH OBSERVATIONS.

MAXIMUM POSSIBLE INCIDENCE = (DAYS x RATS)/NUMBER OF RATS EXAMINED PER GROUP

N/N = TOTAL NUMBER OF OBSERVATIONS/NUMBER OF RATS WITH OBSERVATION

a. Rats were given continual access to the carrier control or test substance in the diet.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 6 (PAGE 1): DETAILED CLINICAL OBSERVATIONS - SUMMARY - FEMALE RATS - MAIN STUDY

DOSAGE GROUP CONCENTRATION (PPM) ^a	I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
MAXIMUM POSSIBLE INCIDENCE	140/ 10	140/ 10	140/ 10	140/ 10	140/ 10
MORTALITY	0	0	0	0	0
DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL	117/ 10	104/ 9	108/ 10	93/ 10	118/ 10
DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL	13/ 5	28/ 7	23/ 4	39/ 7	14/ 4
CHROMORHINORRHEA	3/ 2	0/ 0	1/ 1	0/ 0	5/ 3
UNGROOMED COAT	0/ 0	0/ 0	0/ 0	1/ 1	5/ 1
URINE-STAINED ABDOMINAL FUR	0/ 0	0/ 0	0/ 0	1/ 1	3/ 1
LOCALIZED ALOPECIA: LIMB(S)	0/ 0	0/ 0	0/ 0	0/ 0	5/ 1
CHROMODACRYORRHEA	2/ 1	3/ 3	1/ 1	5/ 2	0/ 0
INCISOR(S): TOTAL	1/ 1	1/ 1	0/ 0	9/ 3	0/ 0
MISSING/BROKEN	1/ 1	1/ 1	0/ 0	3/ 2	0/ 0
MISALIGNED	1/ 1	0/ 0	0/ 0	6/ 2	0/ 0
SPARSE HAIR COAT: TOTAL	4/ 1	9/ 2	14/ 2	4/ 1	0/ 0
LIMB(S)	4/ 1	7/ 1	14/ 2	4/ 1	0/ 0
BACK	0/ 0	2/ 1	0/ 0	0/ 0	0/ 0
TAIL: BENT	0/ 0	14/ 2	6/ 1	9/ 1	0/ 0
MOUTH, BASE OF TAIL OR TAIL: SCAB	5/ 3	0/ 0	0/ 0	1/ 1	0/ 0
RIGHT EAR: TORN	0/ 0	0/ 0	0/ 0	10/ 1	0/ 0
UMBILICAL HERNIA	0/ 0	0/ 0	0/ 0	4/ 1	0/ 0

STATISTICAL ANALYSES OF DETAILED CLINICAL OBSERVATION DATA WERE RESTRICTED TO THE NUMBER OF RATS WITH OBSERVATIONS.

MAXIMUM POSSIBLE INCIDENCE = (WEEKS x RATS)/NUMBER OF RATS EXAMINED PER GROUP

N/N = TOTAL NUMBER OF OBSERVATIONS/NUMBER OF RATS WITH OBSERVATION

a. Rats were given continual access to the carrier control or test substance in the diet.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 6 (PAGE 2): DETAILED CLINICAL OBSERVATIONS - SUMMARY - FEMALE RATS - MAIN STUDY

DOSAGE GROUP CONCENTRATION (PPM) ^a	I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
MAXIMUM POSSIBLE INCIDENCE	140/ 10	140/ 10	140/ 10	140/ 10	140/ 10
MORTALITY	0	0	0	0	0
LOWER MIDLINE: MASS	0/ 0	0/ 0	0/ 0	1/ 1	0/ 0
TIP OF TAIL: RED	0/ 0	0/ 0	2/ 1	0/ 0	0/ 0
BOTH EARS: SWOLLEN	0/ 0	2/ 1	0/ 0	0/ 0	0/ 0
SNOUT: SWOLLEN	1/ 1	0/ 0	0/ 0	0/ 0	0/ 0

STATISTICAL ANALYSES OF DETAILED CLINICAL OBSERVATION DATA WERE RESTRICTED TO THE NUMBER OF RATS WITH OBSERVATIONS.

MAXIMUM POSSIBLE INCIDENCE = (WEEKS x RATS)/NUMBER OF RATS EXAMINED PER GROUP

N/N = TOTAL NUMBER OF OBSERVATIONS/NUMBER OF RATS WITH OBSERVATION

a. Rats were given continual access to the carrier control or test substance in the diet.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 7 (PAGE 1): BODY WEIGHTS - SUMMARY - MALE RATS - MAIN STUDY

DOSAGE GROUP CONCENTRATION (PPM) ^a		I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS TESTED	N	10	10	10	10	10
BODY WEIGHT (G)						
DAY 1	MEAN±S.D.	158.2 ± 15.6	156.4 ± 17.9	153.4 ± 15.2	157.3 ± 16.2	158.3 ± 16.2
DAY 8	MEAN±S.D.	229.4 ± 18.2	226.9 ± 23.3	220.5 ± 20.6	214.4 ± 24.2	195.5 ± 22.6**
DAY 15	MEAN±S.D.	295.5 ± 24.2	291.7 ± 29.6	280.7 ± 25.8	273.2 ± 29.0	263.6 ± 32.0
DAY 22	MEAN±S.D.	361.1 ± 30.8	352.0 ± 38.3	341.4 ± 29.9	330.4 ± 39.6	324.8 ± 43.1
DAY 29	MEAN±S.D.	414.5 ± 34.6	401.0 ± 42.0	388.7 ± 38.2	374.3 ± 48.1	370.4 ± 50.8
DAY 36	MEAN±S.D.	465.1 ± 43.8	441.6 ± 48.0	430.7 ± 43.5	411.7 ± 54.9	410.4 ± 57.9
DAY 43	MEAN±S.D.	503.2 ± 48.5	477.9 ± 50.8	467.0 ± 49.8	442.8 ± 62.9	443.4 ± 62.9
DAY 50	MEAN±S.D.	533.2 ± 52.7	505.0 ± 55.4	493.9 ± 51.8	465.8 ± 66.5	471.0 ± 68.1
DAY 57	MEAN±S.D.	564.8 ± 58.3	533.0 ± 59.9	523.8 ± 57.0	490.6 ± 69.5	495.9 ± 70.8
DAY 64	MEAN±S.D.	590.1 ± 63.0	553.8 ± 57.3	546.8 ± 58.9	512.2 ± 70.8	518.1 ± 73.1
DAY 71	MEAN±S.D.	607.4 ± 63.6	575.0 ± 56.9	567.9 ± 61.6	530.7 ± 72.9	537.3 ± 75.2
DAY 78	MEAN±S.D.	622.2 ± 69.8	590.2 ± 60.1	582.5 ± 65.6	546.3 ± 74.5	554.8 ± 78.0
DAY 85	MEAN±S.D.	640.1 ± 73.1	604.9 ± 61.0	598.2 ± 71.4	557.1 ± 76.9	567.5 ± 78.1
DAY 91b	MEAN±S.D.	623.3 ± 74.4	589.4 ± 61.2	580.1 ± 70.1	544.3 ± 75.8	552.3 ± 77.1

DAY = DAY OF STUDY

a. Rats were given continual access to the carrier control or test substance in the diet.

b. Fasted body weight.

** Significantly different from the carrier group value (p≤0.01).

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 8 (PAGE 1): BODY WEIGHT CHANGES - SUMMARY - MALE RATS - MAIN STUDY

DOSAGE GROUP CONCENTRATION (PPM) ^a		I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS TESTED	N	10	10	10	10	10
BODY WEIGHT CHANGE (G)						
DAYS 1 - 8	MEAN±S.D.	+71.2 ± 5.9	+70.5 ± 9.2	+67.1 ± 10.1	+57.1 ± 9.6**	+37.2 ± 11.0**
DAYS 8 - 15	MEAN±S.D.	+66.1 ± 8.7	+64.8 ± 8.1	+60.2 ± 8.4	+58.8 ± 9.6	+68.1 ± 10.7
DAYS 15 - 22	MEAN±S.D.	+65.6 ± 8.8	+60.3 ± 10.7	+60.7 ± 7.6	+57.2 ± 15.0	+61.2 ± 11.9
DAYS 22 - 29	MEAN±S.D.	+53.4 ± 7.9	+49.0 ± 7.2	+47.3 ± 11.8	+43.9 ± 14.7	+45.6 ± 9.6
DAYS 29 - 36	MEAN±S.D.	+50.6 ± 10.1	+40.6 ± 10.2*	+42.0 ± 6.7	+37.4 ± 9.7**	+40.0 ± 7.9*
DAYS 36 - 43	MEAN±S.D.	+38.1 ± 8.4	+36.3 ± 7.0	+36.3 ± 7.7	+31.1 ± 10.7	+33.0 ± 6.5
DAYS 43 - 50	MEAN±S.D.	+30.0 ± 6.5	+27.1 ± 6.4	+26.9 ± 5.1	+23.0 ± 5.2	+27.6 ± 6.4
DAYS 50 - 57	MEAN±S.D.	+31.6 ± 7.0	+28.0 ± 7.3	+29.9 ± 6.9	+24.8 ± 6.9	+24.9 ± 6.5
DAYS 57 - 64	MEAN±S.D.	+25.3 ± 7.4	+20.8 ± 8.4	+23.0 ± 6.1	+21.6 ± 4.8	+22.2 ± 7.3
DAYS 64 - 71	MEAN±S.D.	+17.3 ± 4.5	+21.2 ± 3.2	+21.1 ± 4.9	+18.5 ± 5.9	+19.2 ± 2.8
DAYS 71 - 78	MEAN±S.D.	+14.8 ± 7.3	+15.2 ± 6.1	+14.6 ± 5.5	+15.6 ± 4.4	+17.5 ± 4.3
DAYS 78 - 85	MEAN±S.D.	+17.9 ± 4.9	+14.7 ± 4.3	+15.7 ± 7.6	+10.8 ± 8.4	+12.7 ± 2.5
DAYS 1 - 85	MEAN±S.D.	+481.9± 63.5	+448.5± 50.5	+444.8± 67.8	+399.8± 67.7*	+409.2± 64.6*
DAYS 85 - 91b	MEAN±S.D.	-16.8 ± 5.0	-15.5 ± 6.2	-18.1 ± 5.5	-12.8 ± 4.4	-15.2 ± 6.7
DAYS 1 - 91b	MEAN±S.D.	+465.1± 65.1	+433.0± 51.0	+426.7± 67.3	+387.0± 67.0	+394.0± 64.2

DAYS = DAYS OF STUDY

a. Rats were given continual access to the carrier control or test substance in the diet.

b. Fasted body weight.

* Significantly different from the carrier group value (p≤0.05).

** Significantly different from the carrier group value (p≤0.01).

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 9 (PAGE 1): BODY WEIGHTS - SUMMARY - FEMALE RATS - MAIN STUDY

DOSAGE GROUP CONCENTRATION (PPM) a		I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS TESTED		N	10	10	10	10
BODY WEIGHT (G)						
DAY 1	MEAN±S.D.	153.6 ± 16.8	150.4 ± 12.7	149.7 ± 16.4	152.5 ± 14.8	150.3 ± 14.5
DAY 8	MEAN±S.D.	186.1 ± 19.6	183.2 ± 13.5	182.0 ± 16.8	189.6 ± 13.8	173.1 ± 18.2
DAY 15	MEAN±S.D.	216.5 ± 24.2	212.0 ± 18.7	213.6 ± 20.3	220.0 ± 16.9	200.2 ± 22.1
DAY 22	MEAN±S.D.	244.5 ± 30.0	236.8 ± 19.8	236.8 ± 21.6	240.2 ± 16.5	219.6 ± 24.2
DAY 29	MEAN±S.D.	265.6 ± 36.7	254.3 ± 28.0	252.3 ± 26.0	264.0 ± 24.2	236.9 ± 26.0
DAY 36	MEAN±S.D.	284.1 ± 43.5	271.7 ± 31.1	265.8 ± 29.8	279.6 ± 25.5	252.9 ± 30.0
DAY 43	MEAN±S.D.	299.6 ± 45.9	287.2 ± 34.7	282.3 ± 28.9	297.5 ± 29.6	263.4 ± 31.9
DAY 50	MEAN±S.D.	317.0 ± 49.4	298.1 ± 36.5	296.3 ± 29.7	310.9 ± 31.4	271.9 ± 32.3
DAY 57	MEAN±S.D.	328.3 ± 50.4	308.9 ± 39.0	307.0 ± 31.2	322.5 ± 36.1	281.2 ± 32.2
DAY 64	MEAN±S.D.	337.4 ± 55.4	316.9 ± 40.2	312.8 ± 35.2	332.6 ± 40.4	288.5 ± 34.7
DAY 71	MEAN±S.D.	344.3 ± 57.1	322.6 ± 40.8	321.3 ± 37.2	341.0 ± 48.6	292.8 ± 37.9
DAY 78	MEAN±S.D.	354.0 ± 58.7	329.8 ± 40.1	329.6 ± 37.2	352.0 ± 50.3	298.5 ± 38.5
DAY 85	MEAN±S.D.	359.7 ± 60.3	332.0 ± 38.0	333.6 ± 40.2	358.3 ± 51.7	304.1 ± 39.5
DAY 91b	MEAN±S.D.	351.5 ± 60.0	322.6 ± 36.1	324.8 ± 39.4	349.8 ± 52.2	296.0 ± 40.6

DAY = DAY OF STUDY

a. Rats were given continual access to the carrier control or test substance in the diet.

b. Fasted body weight.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 10 (PAGE 1): BODY WEIGHT CHANGES - SUMMARY - FEMALE RATS - MAIN STUDY

DOSAGE GROUP CONCENTRATION (PPM) ^a		I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS TESTED	N	10	10	10	10	10
BODY WEIGHT CHANGE (G)						
DAYS 1 - 8	MEAN±S.D.	+32.5 ± 8.5	+32.8 ± 8.9	+32.3 ± 5.1	+37.1 ± 9.6	+22.8 ± 5.3*
DAYS 8 - 15	MEAN±S.D.	+30.4 ± 5.5	+28.8 ± 7.3	+31.6 ± 4.2	+30.4 ± 7.7	+27.1 ± 6.6
DAYS 15 - 22	MEAN±S.D.	+28.0 ± 8.0	+24.8 ± 20.7	+23.2 ± 5.6	+20.2 ± 5.4	+19.4 ± 3.8
DAYS 22 - 29	MEAN±S.D.	+21.1 ± 9.3	+17.5 ± 28.9	+15.5 ± 6.1	+23.8 ± 11.9	+17.3 ± 4.5
DAYS 29 - 36	MEAN±S.D.	+18.5 ± 9.8	+17.4 ± 5.2	+13.5 ± 7.2	+15.6 ± 3.4	+16.0 ± 5.0
DAYS 36 - 43	MEAN±S.D.	+15.5 ± 7.0	+15.5 ± 8.1	+16.5 ± 6.2	+17.9 ± 8.1	+10.5 ± 5.1
DAYS 43 - 50	MEAN±S.D.	+17.4 ± 4.9	+10.9 ± 4.6**	+14.0 ± 4.4	+13.4 ± 3.7	+8.5 ± 4.7**
DAYS 50 - 57	MEAN±S.D.	+11.3 ± 3.8	+10.8 ± 5.2	+10.7 ± 4.0	+11.6 ± 8.4	+9.3 ± 4.3
DAYS 57 - 64	MEAN±S.D.	+9.1 ± 8.0	+8.0 ± 3.8	+5.8 ± 4.5	+10.1 ± 9.7	+7.3 ± 4.7
DAYS 64 - 71	MEAN±S.D.	+6.9 ± 5.0	+5.7 ± 4.7	+8.5 ± 2.5	+8.4 ± 12.6	+4.3 ± 4.8
DAYS 71 - 78	MEAN±S.D.	+9.7 ± 5.6	+7.2 ± 3.6	+8.3 ± 1.9	+11.0 ± 7.6	+5.7 ± 2.4
DAYS 78 - 85	MEAN±S.D.	+5.7 ± 4.2	+2.2 ± 7.5	+4.0 ± 5.5	+6.3 ± 6.1	+5.6 ± 4.5
DAYS 1 - 85	MEAN±S.D.	+206.1± 47.7	+181.6± 36.1	+183.9± 28.4	+205.8± 46.0	+153.8± 29.4**
DAYS 85 - 91b	MEAN±S.D.	-8.2 ± 3.6	-9.4 ± 4.2	-8.8 ± 4.5	-8.5 ± 5.1	-8.1 ± 4.2
DAYS 1 - 91b	MEAN±S.D.	+197.9± 47.5	+172.2± 34.3	+175.1± 27.6	+197.3± 46.7	+145.7± 30.6**

DAYS = DAYS OF STUDY

a. Rats were given continual access to the carrier control or test substance in the diet.

b. Fasted body weight.

* Significantly different from the carrier group value (p≤0.05).

** Significantly different from the carrier group value (p≤0.01).

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 11 (PAGE 1): ABSOLUTE FEED CONSUMPTION VALUES (G/DAY) - SUMMARY - MALE RATS - MAIN STUDY

DOSAGE GROUP CONCENTRATION (PPM) ^a		I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS TESTED	N	10	10	10	10	10
FEED CONSUMPTION (G/DAY)						
DAYS 1 - 8	MEAN±S.D.	22.6 ± 2.0	22.7 ± 2.4	22.0 ± 1.8	21.8 ± 2.7	18.0 ± 2.7**
DAYS 8 - 15	MEAN±S.D.	25.1 ± 2.2	24.6 ± 2.4	23.6 ± 2.2	24.1 ± 2.8	24.3 ± 3.1
DAYS 15 - 22	MEAN±S.D.	26.2 ± 2.9	25.4 ± 2.5	24.5 ± 3.0	24.6 ± 3.2	[9] ^b 25.2 ± 3.4
DAYS 22 - 29	MEAN±S.D.	28.4 ± 2.8	27.2 ± 2.8	25.9 ± 2.5	25.6 ± 3.4	26.1 ± 3.2
DAYS 29 - 36	MEAN±S.D.	27.8 ± 3.1	26.9 ± 2.6	25.2 ± 2.9	24.6 ± 3.3	25.0 ± 3.3
DAYS 36 - 43	MEAN±S.D.	28.2 ± 3.1	27.4 ± 2.4	25.9 ± 3.0	24.4 ± 3.1	25.5 ± 3.3
DAYS 43 - 50	MEAN±S.D.	27.1 ± 3.1	26.4 ± 2.8	25.1 ± 2.7	23.8 ± 3.0	25.1 ± 3.5
DAYS 50 - 57	MEAN±S.D.	26.7 ± 2.9	25.8 ± 2.4	25.0 ± 2.6	23.4 ± 3.2	24.5 ± 3.1
DAYS 57 - 64	MEAN±S.D.	27.4 ± 3.1	25.6 ± 2.2	25.3 ± 2.7	23.9 ± 2.8	24.8 ± 3.1
DAYS 64 - 71	MEAN±S.D.	27.2 ± 3.0	26.0 ± 2.0	25.4 ± 2.5	23.7 ± 3.0	24.8 ± 3.1
DAYS 71 - 78	MEAN±S.D.	26.5 ± 3.3	26.2 ± 4.0	24.4 ± 2.5	23.3 ± 2.6	24.4 ± 3.1
DAYS 78 - 85	MEAN±S.D.	26.4 ± 2.9	25.3 ± 2.3	24.5 ± 3.0	22.8 ± 2.9	24.4 ± 2.8
DAYS 85 - 90	MEAN±S.D.	25.1 ± 4.5	24.4 ± 3.0	24.0 ± 3.7	22.5 ± 2.5	23.5 ± 3.3
DAYS 1 - 90	MEAN±S.D.	26.5 ± 2.8	25.7 ± 2.2	24.7 ± 2.5	23.8 ± 2.8	24.3 ± 3.0

DAYS = DAYS OF STUDY

[] = NUMBER OF VALUES AVERAGED

a. Rats were given continual access to the carrier control or test substance in the diet.

b. Excludes a value that appeared incorrectly recorded.

** Significantly different from the carrier group value (p≤0.01).

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 12 (PAGE 1): RELATIVE FEED CONSUMPTION VALUES (G/KG/DAY) - SUMMARY - MALE RATS - MAIN STUDY

DOSAGE GROUP CONCENTRATION (PPM) a		I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS TESTED	N	10	10	10	10	10
FEED CONSUMPTION (G/KG/DAY)						
DAYS 1 - 8	MEAN±S.D.	116.7 ± 4.7	118.5 ± 5.6	118.1 ± 5.4	118.3 ± 5.6	105.5 ± 10.3**
DAYS 8 - 15	MEAN±S.D.	95.8 ± 5.2	95.2 ± 5.3	94.5 ± 5.8	99.0 ± 5.0	107.1 ± 6.7**
DAYS 15 - 22	MEAN±S.D.	79.8 ± 4.5	79.0 ± 4.8	78.8 ± 5.8	81.4 ± 5.9	[9]b 85.7 ± 3.2*
DAYS 22 - 29	MEAN±S.D.	73.1 ± 4.0	72.5 ± 4.2	70.9 ± 3.2	72.8 ± 5.0	75.3 ± 3.0
DAYS 29 - 36	MEAN±S.D.	63.1 ± 3.3	64.0 ± 2.8	61.4 ± 3.3	62.6 ± 4.5	64.2 ± 2.4
DAYS 36 - 43	MEAN±S.D.	58.3 ± 2.8	59.8 ± 4.2	57.7 ± 2.0	57.2 ± 3.2	59.8 ± 1.9
DAYS 43 - 50	MEAN±S.D.	52.4 ± 3.4	53.7 ± 2.9	52.2 ± 2.2	52.6 ± 3.0	54.9 ± 2.4
DAYS 50 - 57	MEAN±S.D.	48.7 ± 2.4	49.8 ± 3.2	49.2 ± 2.5	49.0 ± 3.6	50.8 ± 2.6
DAYS 57 - 64	MEAN±S.D.	47.5 ± 3.4	47.2 ± 3.6	47.4 ± 2.7	48.0 ± 3.6	49.2 ± 3.3
DAYS 64 - 71	MEAN±S.D.	45.4 ± 3.0	46.3 ± 2.6	45.6 ± 1.9	45.6 ± 2.7	47.0 ± 2.2
DAYS 71 - 78	MEAN±S.D.	43.1 ± 3.4	45.1 ± 5.3	42.4 ± 1.4	43.4 ± 2.8	44.8 ± 2.6
DAYS 78 - 85	MEAN±S.D.	41.9 ± 2.6	42.5 ± 2.6	41.6 ± 2.7	41.5 ± 2.5	43.6 ± 2.9
DAYS 1 - 85	MEAN±S.D.	70.9 ± 3.6	71.6 ± 3.0	70.0 ± 2.9	70.7 ± 3.3	73.4 ± 2.2

DAYS = DAYS OF STUDY

[] = NUMBER OF VALUES AVERAGED

a. Rats were given continual access to the carrier control or test substance in the diet.

b. Excludes a value that appeared incorrectly recorded.

* Significantly different from the carrier group value (p≤0.05).

** Significantly different from the carrier group value (p≤0.01).

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 13 (PAGE 1): FEED EFFICIENCY - SUMMARY - MALE RATS - MAIN STUDY

DOSAGE GROUP CONCENTRATION (PPM) ^a		I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS TESTED		10	10	10	10	10
FEED EFFICIENCY (%) ^b						
DAYS 1 - 8	MEAN±S.D.	45.2 ± 3.2	44.3 ± 3.4	43.4 ± 4.5	37.2 ± 3.0**	28.9 ± 4.9**
DAYS 8 - 15	MEAN±S.D.	37.5 ± 3.4	37.5 ± 2.9	36.3 ± 3.1	35.0 ± 4.9	39.2 ± 3.7
DAYS 15 - 22	MEAN±S.D.	35.6 ± 2.3	33.8 ± 4.1	35.4 ± 2.2	33.0 ± 5.9	[9] ^c 34.4 ± 2.7
DAYS 22 - 29	MEAN±S.D.	26.9 ± 3.2	25.6 ± 3.0	25.9 ± 4.9	24.0 ± 6.8	24.8 ± 3.1
DAYS 29 - 36	MEAN±S.D.	25.9 ± 3.4	21.5 ± 4.9*	23.7 ± 2.3	21.5 ± 4.2*	22.6 ± 2.3
DAYS 36 - 43	MEAN±S.D.	19.2 ± 3.3	18.8 ± 3.0	19.8 ± 2.6	17.8 ± 5.0	18.3 ± 2.4
DAYS 43 - 50	MEAN±S.D.	15.6 ± 2.4	14.5 ± 2.5	15.4 ± 2.5	13.6 ± 2.0	15.6 ± 2.2
DAYS 50 - 57	MEAN±S.D.	16.7 ± 2.8	15.3 ± 3.2	16.8 ± 2.6	15.0 ± 3.3	14.6 ± 3.1
DAYS 57 - 64	MEAN±S.D.	12.9 ± 2.8	11.5 ± 4.3	12.8 ± 3.0	12.8 ± 2.6	12.6 ± 3.2
DAYS 64 - 71	MEAN±S.D.	9.0 ± 2.1	11.7 ± 1.9**	11.7 ± 2.0**	11.0 ± 2.8	11.1 ± 0.9*
DAYS 71 - 78	MEAN±S.D.	7.8 ± 3.0	8.1 ± 3.0	8.4 ± 2.6	9.5 ± 2.4	10.1 ± 1.8
DAYS 78 - 85	MEAN±S.D.	9.6 ± 1.9	8.3 ± 2.3	8.7 ± 3.4	6.5 ± 5.2	7.5 ± 1.4
DAYS 1 - 85	MEAN±S.D.	21.5 ± 1.0	20.7 ± 1.1	21.3 ± 1.3	19.8 ± 1.8*	19.8 ± 0.9**

DAYS = DAYS OF STUDY

[] = NUMBER OF VALUES AVERAGED

a. Rats were given continual access to the carrier control or test substance in the diet.

b. FEED EFFICIENCY = [(AVERAGE G/DAY OF BODY WEIGHT CHANGE) / (AVERAGE G/DAY OF FEED CONSUMPTION)] * 100

c. Excludes a value that appeared incorrectly recorded.

* Significantly different from the carrier group value (p≤0.05).

** Significantly different from the carrier group value (p≤0.01).

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 14 (PAGE 1): ABSOLUTE FEED CONSUMPTION VALUES (G/DAY) - SUMMARY - FEMALE RATS - MAIN STUDY

DOSAGE GROUP CONCENTRATION (PPM) ^a		I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS TESTED	N	10	10	10	10	10
FEED CONSUMPTION (G/DAY)						
DAYS 1 - 8	MEAN±S.D.	17.0 ± 1.8	17.2 ± 2.0	16.8 ± 1.2	17.8 ± 1.7	14.8 ± 1.7**
DAYS 8 - 15	MEAN±S.D.	15.0 ± 3.7	17.0 ± 5.4	15.1 ± 2.9	16.4 ± 4.0	13.1 ± 3.8
DAYS 15 - 22	MEAN±S.D.	18.5 ± 2.5	18.1 ± 3.9	17.7 ± 1.8	18.7 ± 1.2	16.2 ± 1.8
DAYS 22 - 29	MEAN±S.D.	19.4 ± 3.9	17.5 ± 7.5	18.2 ± 1.7	19.9 ± 5.2	16.8 ± 2.0
DAYS 29 - 36	MEAN±S.D.	19.0 ± 3.0	19.9 ± 5.4	17.8 ± 2.1	18.1 ± 2.0	16.4 ± 2.0
DAYS 36 - 43	MEAN±S.D.	19.2 ± 3.0	20.4 ± 5.5	18.1 ± 1.6	18.8 ± 1.9	16.4 ± 2.0
DAYS 43 - 50	MEAN±S.D.	19.1 ± 2.9	18.9 ± 4.5	17.8 ± 2.1	18.7 ± 2.1	16.1 ± 1.8
DAYS 50 - 57	MEAN±S.D.	17.6 ± 2.1	17.6 ± 3.6	16.9 ± 2.1	17.7 ± 2.4	15.7 ± 2.1
DAYS 57 - 64	MEAN±S.D.	16.8 ± 2.2	17.4 ± 3.3	16.3 ± 2.1	17.4 ± 2.3	15.1 ± 1.9
DAYS 64 - 71	MEAN±S.D.	17.2 ± 2.2	17.1 ± 2.6	16.8 ± 1.7	16.8 ± 3.4	15.4 ± 2.3
DAYS 71 - 78	MEAN±S.D.	17.2 ± 2.3	16.9 ± 2.6	16.4 ± 2.2	17.4 ± 2.4	16.5 ± 3.4
DAYS 78 - 85	MEAN±S.D.	16.4 ± 1.7	16.5 ± 2.4	16.0 ± 2.5	16.7 ± 1.8	16.3 ± 3.6
DAYS 85 - 90	MEAN±S.D.	16.7 ± 2.0	15.5 ± 2.0	15.9 ± 2.0	16.7 ± 2.2	15.0 ± 2.2
DAYS 1 - 90	MEAN±S.D.	17.7 ± 2.0	17.7 ± 3.4	16.9 ± 1.6	17.8 ± 1.7	15.7 ± 1.8

DAYS = DAYS OF STUDY

[] = NUMBER OF VALUES AVERAGED

a. Rats were given continual access to the carrier control or test substance in the diet.

b. Excludes values that were not recorded, as well as those associated with spillage.

** Significantly different from the carrier group value (p≤0.01).

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 15 (PAGE 1): RELATIVE FEED CONSUMPTION VALUES (G/KG/DAY) - SUMMARY - FEMALE RATS - MAIN STUDY

DOSAGE GROUP CONCENTRATION (PPM) ^a		I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS TESTED	N	10	10	10	10	10
FEED CONSUMPTION (G/KG/DAY)						
DAYS 1 - 8	MEAN±S.D.	100.0 ± 6.1	102.8 ± 10.9	100.3 ± 7.3	104.3 ± 10.3	93.1 ± 7.4
DAYS 8 - 15	MEAN±S.D.	75.4 ± 18.7	85.3 ± 23.7	77.4 ± 16.7	81.0 ± 22.4	71.6 ± 23.4
DAYS 15 - 22	MEAN±S.D.	80.1 ± 3.3	81.0 ± 18.5	78.6 ± 6.1	81.6 ± 6.6	77.3 ± 5.4
DAYS 22 - 29	MEAN±S.D.	75.6 ± 8.3	71.1 ± 28.9	73.6 ± 3.9	79.3 ± 22.3	73.7 ± 5.8
DAYS 29 - 36	MEAN±S.D.	68.9 ± 3.8	74.9 ± 14.1	68.6 ± 4.6	66.7 ± 3.4	67.2 ± 3.5
DAYS 36 - 43	MEAN±S.D.	66.0 ± 5.0	70.9 ± 13.2	66.1 ± 3.4	65.4 ± 3.2	63.5 ± 3.6
DAYS 43 - 50	MEAN±S.D.	62.2 ± 5.0	64.1 ± 9.0	61.7 ± 3.6	61.5 ± 3.8	60.3 ± 4.4
DAYS 50 - 57	MEAN±S.D.	55.1 ± 3.5	57.9 ± 6.6	56.6 ± 3.5	55.8 ± 3.8	56.8 ± 5.8
DAYS 57 - 64	MEAN±S.D.	50.8 ± 4.5	55.7 ± 6.5	52.7 ± 3.8	53.2 ± 2.8	54.2 ± 6.0
DAYS 64 - 71	MEAN±S.D.	51.0 ± 4.4	53.4 ± 4.4	53.0 ± 3.3	49.6 ± 5.7	53.2 ± 5.8
DAYS 71 - 78	MEAN±S.D.	49.8 ± 6.1	51.8 ± 4.1	50.5 ± 4.2	50.2 ± 3.5	55.8 ± 9.0
DAYS 78 - 85	MEAN±S.D.	46.8 ± 6.0	50.0 ± 4.5	48.3 ± 4.1	47.3 ± 4.4	54.0 ± 9.8
DAYS 1 - 85	MEAN±S.D.	71.6 ± 3.2	74.8 ± 9.7	71.8 ± 3.5	72.6 ± 4.9	71.9 ± 5.9

DAYS = DAYS OF STUDY

[] = NUMBER OF VALUES AVERAGED

a. Rats were given continual access to the carrier control or test substance in the diet.

b. Excludes values that were not recorded, as well as those associated with spillage.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 16 (PAGE 1): FEED EFFICIENCY - SUMMARY - FEMALE RATS - MAIN STUDY

DOSAGE GROUP CONCENTRATION (PPM) ^a		I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS TESTED		10	10	10	10	10
FEED EFFICIENCY (%) ^b						
DAYS 1 - 8	MEAN±S.D.	26.8 ± 5.3	26.7 ± 4.9	27.2 ± 3.2	29.4 ± 5.6	21.7 ± 3.0*
DAYS 8 - 15	MEAN±S.D.	32.3 ± 18.2	25.3 ± 6.2	31.4 ± 10.7	27.3 ± 8.0	33.0 ± 15.6
DAYS 15 - 22	MEAN±S.D.	21.3 ± 4.2	22.8 ± 25.4	18.6 ± 3.6	15.5 ± 4.3*	16.9 ± 2.1
DAYS 22 - 29	MEAN±S.D.	15.2 ± 5.3	8.7 ± 25.4	12.3 ± 3.9 [9] ^c	17.5 ± 7.7	14.5 ± 3.0
DAYS 29 - 36	MEAN±S.D.	13.4 ± 6.8	12.9 ± 3.5	10.7 ± 5.0	12.3 ± 2.6	13.6 ± 3.3
DAYS 36 - 43	MEAN±S.D.	11.4 ± 4.8	10.3 ± 3.0 [9] ^c	12.9 ± 4.6	13.2 ± 5.1	9.0 ± 4.3
DAYS 43 - 50	MEAN±S.D.	12.7 ± 2.4	8.2 ± 3.4**	11.1 ± 3.1	10.2 ± 2.6	7.4 ± 4.1**
DAYS 50 - 57	MEAN±S.D.	9.0 ± 2.8	8.7 ± 3.2	9.1 ± 2.4 [9] ^c	8.9 ± 4.8	8.2 ± 3.2
DAYS 57 - 64	MEAN±S.D.	7.2 ± 5.9	6.3 ± 2.6	4.6 ± 3.4	7.9 ± 7.7	6.2 ± 3.7 [9] ^c
DAYS 64 - 71	MEAN±S.D.	5.7 ± 4.0	4.6 ± 4.1	7.0 ± 1.6	5.4 ± 10.1	3.5 ± 3.9
DAYS 71 - 78	MEAN±S.D.	7.7 ± 4.2	6.2 ± 3.5	7.2 ± 2.1	8.7 ± 6.0	4.9 ± 2.4
DAYS 78 - 85	MEAN±S.D.	4.7 ± 2.9	2.0 ± 6.5	3.2 ± 4.3	5.2 ± 4.9	4.9 ± 3.6
DAYS 1 - 85	MEAN±S.D.	13.6 ± 1.7	12.2 ± 0.8*	12.8 ± 1.0	13.6 ± 1.6	11.6 ± 1.1**

DAYS = DAYS OF STUDY

[] = NUMBER OF VALUES AVERAGED

a. Rats were given continual access to the carrier control or test substance in the diet.

b. FEED EFFICIENCY = [(AVERAGE G/DAY OF BODY WEIGHT CHANGE) / (AVERAGE G/DAY OF FEED CONSUMPTION)] * 100

c. Excludes values that were not recorded, as well as those associated with spillage.

* Significantly different from the carrier group value (p≤0.05).

** Significantly different from the carrier group value (p≤0.01).

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 17 (PAGE 1): NECROPSY OBSERVATIONS - SUMMARY - MALE RATS - MAIN STUDY

DOSAGE GROUP CONCENTRATION (PPM) ^a		I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS EXAMINED	N	10	10	10	10	10
MORTALITY	N	0	0	0	0	0
APPEARED NORMAL	N	7	9	10	8	9
THYMUS: NUMEROUS RED AREAS	N	1	0	0	0	0
LYMPH NODES: SUBMANDIBULAR, DARK RED	N	1	1	0	1	0
LIVER: RIGHT LATERAL LOBE, MISSHAPEN	N	1	0	0	0	0
KIDNEYS: RIGHT, PELVIS, SLIGHT DILATION	N	0	0	0	1	1
SPLEEN: CONSTRICTED AREA	N	1	0	0	0	0

a. Rats were given continual access to the carrier control or test substance in the diet.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 18 (PAGE 1): NECROPSY OBSERVATIONS - SUMMARY - FEMALE RATS - MAIN STUDY

DOSAGE GROUP CONCENTRATION (PPM) a		I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS EXAMINED	N	10	10	10	10	10
MORTALITY	N	0	0	0	0	0
APPEARED NORMAL	N	9	9	10	10	10
LYMPH NODES: SUBMANDIBULAR, RED	N	0	1	0	0	0
ABDOMINAL ADIPOSE: MASS	N	1	0	0	0	0

a. Rats were given continual access to the carrier control or test substance in the diet.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 19 (PAGE 1): CONSUMED DOSAGES (MG/KG/DAY) - SUMMARY - MALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP CONCENTRATION (PPM) a	I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS TESTED	15	15	15	15	15
DIETARY DOSAGE (MG/KG/DAY)					
DAYS 1 - 8	MEAN±S.D. 0.0 ± 0.0	9.7 ± 0.5	48.4 ± 2.3	491.4 ± 19.8	939.5 ± 61.2
DAYS 8 - 15	MEAN±S.D. 0.0 ± 0.0	7.8 ± 0.4	40.0 ± 3.0	401.8 ± 18.5	848.3 ± 71.0
DAYS 15 - 22	MEAN±S.D. 0.0 ± 0.0	7.1 ± 0.3	36.2 ± 1.9	357.9 ± 15.4	747.8 ± 73.0
DAYS 22 - 29	MEAN±S.D. 0.0 ± 0.0 [14]b	6.3 ± 0.2	31.4 ± 1.4	310.6 ± 20.9	633.3 ± 36.7
DAYS 29 - 36	MEAN±S.D. 0.0 ± 0.0	5.8 ± 0.3	29.5 ± 1.2	290.4 ± 14.8	598.2 ± 36.1
DAYS 36 - 43	MEAN±S.D. 0.0 ± 0.0	5.5 ± 0.3	27.4 ± 1.0	269.7 ± 13.2 [14]b	556.4 ± 36.7
DAYS 43 - 50	MEAN±S.D. 0.0 ± 0.0	5.0 ± 0.2	26.0 ± 1.7	256.5 ± 13.0	512.1 ± 24.4
DAYS 50 - 57	MEAN±S.D. 0.0 ± 0.0	4.8 ± 0.2	24.6 ± 1.6	243.6 ± 14.6	494.3 ± 23.3 [14]b
DAYS 57 - 64	MEAN±S.D. 0.0 ± 0.0	4.7 ± 0.2	23.8 ± 1.2	233.2 ± 12.9	473.5 ± 23.1
DAYS 64 - 71	MEAN±S.D. 0.0 ± 0.0	4.4 ± 0.1	22.6 ± 1.2	219.9 ± 13.3	448.4 ± 25.8
DAYS 71 - 78	MEAN±S.D. 0.0 ± 0.0	4.2 ± 0.3	20.8 ± 1.4	213.6 ± 15.5	441.0 ± 24.2
DAYS 78 - 85	MEAN±S.D. 0.0 ± 0.0	4.1 ± 0.2 [14]c	21.1 ± 1.5	211.7 ± 15.3	425.7 ± 19.2
DAYS 85 - 91	MEAN±S.D. 0.0 ± 0.0	4.1 ± 0.2 [14]c	20.1 ± 1.4	202.7 ± 11.2	413.3 ± 16.4
DAYS 1 - 91	MEAN±S.D. 0.0 ± 0.0	6.2 ± 0.2 [14]c	31.4 ± 1.3 [14]c	311.8 ± 13.2	635.3 ± 25.2

DAYS = DAYS OF STUDY

[] = NUMBER OF VALUES AVERAGED

a. Rats were given continual access to the carrier control or test substance in the diet.

b. Excludes values that were not recorded, as well as those associated with spillage.

c. Excludes values for rats that were found dead or euthanized due to adverse clinical observations.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 20 (PAGE 1): CONSUMED DOSAGES (MG/KG/DAY) - SUMMARY - FEMALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP CONCENTRATION (PPM) a		I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS TESTED	N	15	15	15	15	15
DIETARY DOSAGE (MG/KG/DAY)						
DAYS 1 - 8	MEAN±S.D.	0.0 ± 0.0	9.1 ± 0.5	44.7 ± 3.9 [14]b	439.7 ± 30.1	842.1 ± 60.8
DAYS 8 - 15	MEAN±S.D.	0.0 ± 0.0	7.7 ± 0.5	41.0 ± 3.4	407.2 ± 28.0	856.0 ± 127.7
DAYS 15 - 22	MEAN±S.D.	0.0 ± 0.0	7.7 ± 1.3	37.7 ± 3.1 [13]b	397.5 ± 33.4 [14]b	761.9 ± 44.7 [12]b
DAYS 22 - 29	MEAN±S.D.	0.0 ± 0.0	6.9 ± 0.7	35.0 ± 3.4	346.6 ± 33.3 [14]b	701.3 ± 57.5
DAYS 29 - 36	MEAN±S.D.	0.0 ± 0.0	6.9 ± 1.2	33.7 ± 2.7	340.4 ± 20.0	690.6 ± 47.2
DAYS 36 - 43	MEAN±S.D.	0.0 ± 0.0 [14]b	6.0 ± 0.5	31.9 ± 3.3 [14]b	312.3 ± 20.8	663.0 ± 126.0
DAYS 43 - 50	MEAN±S.D.	0.0 ± 0.0 [14]b	5.6 ± 0.4	29.7 ± 3.0	288.0 ± 16.4 [14]b	587.0 ± 42.8
DAYS 50 - 57	MEAN±S.D.	0.0 ± 0.0	5.3 ± 0.4	27.6 ± 2.9	275.3 ± 15.8	561.6 ± 32.8 [14]b
DAYS 57 - 64	MEAN±S.D.	0.0 ± 0.0	5.3 ± 0.4	26.8 ± 2.6	270.8 ± 21.5	553.7 ± 42.7 [14]b
DAYS 64 - 71	MEAN±S.D.	0.0 ± 0.0	5.0 ± 0.4	25.8 ± 2.5 [14]b	259.3 ± 14.0	521.9 ± 37.8
DAYS 71 - 78	MEAN±S.D.	0.0 ± 0.0	5.0 ± 0.4	25.5 ± 2.0	251.2 ± 18.8	521.0 ± 37.2
DAYS 78 - 85	MEAN±S.D.	0.0 ± 0.0	4.8 ± 0.4	24.7 ± 3.0	242.7 ± 20.2	499.7 ± 32.5
DAYS 85 - 91	MEAN±S.D.	0.0 ± 0.0	4.6 ± 0.3	24.0 ± 2.1	230.3 ± 22.8	472.6 ± 28.7
DAYS 1 - 91	MEAN±S.D.	0.0 ± 0.0	6.6 ± 0.4	33.8 ± 2.4	335.5 ± 12.0	680.3 ± 33.0

DAYS = DAYS OF STUDY

a. Rats were given continual access to the carrier control or test substance in the diet.

b. Excludes values that were associated with spillage.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 21 (PAGE 1): CLINICAL OBSERVATIONS - SUMMARY - MALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP CONCENTRATION (PPM) ^a	I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
MAXIMUM POSSIBLE INCIDENCE	1365/ 15	1351/ 15	1360/ 15	1365/ 15	1365/ 15
MORTALITY	0	1	1	0	0
FOUND DEAD	0	1 ^b	0	0	0
UNSCHEDULED EUTHANASIA	0	0	1 ^c	0	0
TAIL: BENT	115/ 2	0/ 0	115/ 2	65/ 1	59/ 1
INCISOR(S): TOTAL	29/ 1	6/ 1	1/ 1	9/ 1	4/ 1
MISSING/BROKEN	23/ 1	0/ 0	1/ 1 ^c	9/ 1	4/ 1
MISALIGNED	6/ 1	6/ 1	0/ 0	0/ 0	0/ 0
CHROMODACRYORRHEA	27/ 3	0/ 0	10/ 3 ^c	0/ 0	5/ 1
URINE-STAINED ABDOMINAL FUR	0/ 0	0/ 0	0/ 0	0/ 0	53/ 2
CHROMORHINORRHEA	1/ 1	3/ 1	10/ 4 ^c	7/ 4	0/ 0
LOCALIZED ALOPECIA: LIMB(S)	0/ 0	52/ 1	47/ 1	73/ 2	0/ 0
NECK: ABRASION	0/ 0	0/ 0	0/ 0	12/ 1	0/ 0
HEAD: SWOLLEN	0/ 0	0/ 0	0/ 0	2/ 1	0/ 0
HEAD, NECK AND/OR RIGHT EAR: SCAB	0/ 0	17/ 2	30/ 1	0/ 0	0/ 0
SPARSE HAIR COAT: TOTAL	88/ 3	0/ 0 ^{**}	106/ 4	0/ 0 ^{**}	0/ 0 ^{**}
LIMB(S)	87/ 3	0/ 0 ^{**}	106/ 4	0/ 0 ^{**}	0/ 0 ^{**}
UNDERSIDE	50/ 1	0/ 0	0/ 0	0/ 0	0/ 0
VOCALIZATION TO TOUCH	0/ 0	0/ 0	1/ 1 ^c	0/ 0	0/ 0
RED PERIORAL SUBSTANCE	0/ 0	0/ 0	1/ 1 ^c	0/ 0	0/ 0

STATISTICAL ANALYSES OF CLINICAL OBSERVATION DATA WERE RESTRICTED TO THE NUMBER OF RATS WITH OBSERVATIONS.

MAXIMUM POSSIBLE INCIDENCE = (DAYS x RATS)/NUMBER OF RATS EXAMINED PER GROUP

N/N = TOTAL NUMBER OF OBSERVATIONS/NUMBER OF RATS WITH OBSERVATION

a. Rats were given continual access to the carrier control or test substance in the diet.

b. Rat 3747 was found dead on Day 77 of study.

c. Rat 3819 was euthanized on Day 86 of study due to adverse clinical observations.

** Significantly different from the carrier group value (p≤0.01).

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 21 (PAGE 2): CLINICAL OBSERVATIONS - SUMMARY - MALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP CONCENTRATION (PPM) ^a	I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
MAXIMUM POSSIBLE INCIDENCE	1365/ 15	1351/ 15	1360/ 15	1365/ 15	1365/ 15
MORTALITY	0	1	1	0	0
FOUND DEAD	0	1 ^b	0	0	0
UNSCHEDULED EUTHANASIA	0	0	1 ^c	0	0
BROKEN PALATE	0/ 0	0/ 0	1/ 1 ^c	0/ 0	0/ 0
DYSPNEA	0/ 0	0/ 0	1/ 1 ^c	0/ 0	0/ 0
RIGHT EAR: SWOLLEN	0/ 0	0/ 0	1/ 1	0/ 0	0/ 0
SOFT OR LIQUID FECES	3/ 1	1/ 1	0/ 0	0/ 0	0/ 0
LACRIMATION	1/ 1	0/ 0	0/ 0	0/ 0	0/ 0

STATISTICAL ANALYSES OF CLINICAL OBSERVATION DATA WERE RESTRICTED TO THE NUMBER OF RATS WITH OBSERVATIONS.

MAXIMUM POSSIBLE INCIDENCE = (DAYS x RATS)/NUMBER OF RATS EXAMINED PER GROUP

N/N = TOTAL NUMBER OF OBSERVATIONS/NUMBER OF RATS WITH OBSERVATION

a. Rats were given continual access to the carrier control or test substance in the diet.

b. Rat 3747 was found dead on Day 77 of study.

c. Rat 3819 was euthanized on Day 86 of study due to adverse clinical observations.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 22 (PAGE 1): DETAILED CLINICAL OBSERVATIONS - SUMMARY - MALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP CONCENTRATION (PPM) ^a	I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
MAXIMUM POSSIBLE INCIDENCE	210/ 15	208/ 15	209/ 15	210/ 15	210/ 15
MORTALITY	0	1	1	0	0
FOUND DEAD	0	1 ^b	0	0	0
UNSCHEDULED EUTHANASIA	0	0	1 ^c	0	0
DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL	125/ 13	147/ 15	127/ 13	153/ 14	157/ 15
DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL	56/ 8	28/ 7	59/ 9	28/ 7	25/ 6
CHROMORHINORRHEA	0/ 0	2/ 2	3/ 3	2/ 2	3/ 3
INCISOR(S): TOTAL	6/ 2	4/ 1	2/ 1	0/ 0	1/ 1
MISALIGNED	6/ 2	4/ 1	2/ 1	0/ 0	1/ 1
MISSING/BROKEN	2/ 1	0/ 0	1/ 1	0/ 0	1/ 1
URINE-STAINED ABDOMINAL FUR	0/ 0	0/ 0	0/ 0	0/ 0	13/ 2
TAIL: BENT	20/ 2	8/ 1	20/ 2	12/ 1	8/ 1
UNGROOMED COAT	1/ 1	1/ 1	1/ 1	0/ 0	2/ 1
SOFT OR LIQUID FECES	0/ 0	0/ 0	1/ 1	0/ 0	1/ 1
SPARSE HAIR COAT: TOTAL	26/ 3	3/ 1	33/ 5	6/ 3	0/ 0
LIMB(S)	26/ 3	3/ 1	33/ 5	6/ 3	0/ 0
UNDERSIDE	8/ 1	0/ 0	0/ 0	0/ 0	0/ 0
LOCALIZED ALOPECIA: LIMB(S)	0/ 0	5/ 1	0/ 0	7/ 1	0/ 0
MOUTH: LACERATION	0/ 0	0/ 0	0/ 0	1/ 1	0/ 0
RIGHT FOREPAW: SWOLLEN	0/ 0	0/ 0	0/ 0	1/ 1	0/ 0
HEAD: SWOLLEN	0/ 0	0/ 0	0/ 0	1/ 1	0/ 0

STATISTICAL ANALYSES OF DETAILED CLINICAL OBSERVATION DATA WERE RESTRICTED TO THE NUMBER OF RATS WITH OBSERVATIONS.

MAXIMUM POSSIBLE INCIDENCE = (WEEKS x RATS)/NUMBER OF RATS EXAMINED PER GROUP

N/N = TOTAL NUMBER OF OBSERVATIONS/NUMBER OF RATS WITH OBSERVATION

a. Rats were given continual access to the carrier control or test substance in the diet.

b. Rat 3747 was found dead on Day 77 of study.

c. Rat 3819 was euthanized on Day 86 of study due to adverse clinical observations.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 22 (PAGE 2): DETAILED CLINICAL OBSERVATIONS - SUMMARY - MALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP CONCENTRATION (PPM) ^a	I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
MAXIMUM POSSIBLE INCIDENCE	210/ 15	208/ 15	209/ 15	210/ 15	210/ 15
MORTALITY	0	1	1	0	0
FOUND DEAD	0	1 ^b	0	0	0
UNSCHEDULED EUTHANASIA	0	0	1 ^c	0	0
CHROMODACRYORRHEA	3/ 2	1/ 1	5/ 3	0/ 0	0/ 0
RIGHT AND/OR LEFT EAR: SWOLLEN	0/ 0	2/ 1	12/ 3	0/ 0	0/ 0
RIGHT EAR, HEAD, TAIL AND/OR BACK: SCAB	2/ 1	4/ 1	3/ 2	0/ 0	0/ 0
LACRIMATION	3/ 2	0/ 0	1/ 1	0/ 0	0/ 0
HEAD: ULCERATION	0/ 0	0/ 0	1/ 1	0/ 0	0/ 0
TAIL: ABRASION	0/ 0	1/ 1	0/ 0	0/ 0	0/ 0

STATISTICAL ANALYSES OF DETAILED CLINICAL OBSERVATION DATA WERE RESTRICTED TO THE NUMBER OF RATS WITH OBSERVATIONS.

MAXIMUM POSSIBLE INCIDENCE = (WEEKS x RATS)/NUMBER OF RATS EXAMINED PER GROUP

N/N = TOTAL NUMBER OF OBSERVATIONS/NUMBER OF RATS WITH OBSERVATION

a. Rats were given continual access to the carrier control or test substance in the diet.

b. Rat 3747 was found dead on Day 77 of study.

c. Rat 3819 was euthanized on Day 86 of study due to adverse clinical observations.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 23 (PAGE 1): CLINICAL OBSERVATIONS - SUMMARY - FEMALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP CONCENTRATION (PPM) ^a	I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
MAXIMUM POSSIBLE INCIDENCE	1365/ 15	1365/ 15	1365/ 15	1365/ 15	1365/ 15
MORTALITY	0	0	0	0	0
URINE-STAINED ABDOMINAL FUR	0/ 0	0/ 0	0/ 0	0/ 0	166/ 5**
SPARSE HAIR COAT: TOTAL	49/ 1	68/ 2	0/ 0	176/ 3	34/ 2
LIMB(S)	49/ 1	61/ 2	0/ 0	176/ 3	34/ 2
BACK	0/ 0	18/ 1	0/ 0	0/ 0	0/ 0
CHROMODACRYORRHEA	1/ 1	4/ 1	10/ 1	0/ 0	42/ 2
BOTH EARS OR RIGHT EAR: SWOLLEN	14/ 1	14/ 1	0/ 0	0/ 0	21/ 2
INCISOR(S): TOTAL	21/ 1	3/ 1	39/ 1	69/ 1	3/ 1
MISSING/BROKEN	0/ 0	3/ 1	0/ 0	68/ 1	3/ 1
MISALIGNED	21/ 1	0/ 0	39/ 1	17/ 1	0/ 0
LACRIMATION	1/ 1	0/ 0	0/ 0	0/ 0	5/ 1
UNGROOMED COAT	0/ 0	0/ 0	0/ 0	0/ 0	3/ 1
LOCALIZED ALOPECIA: LIMB(S)	0/ 0	30/ 1	23/ 1	28/ 1	0/ 0
TAIL: BENT	0/ 0	0/ 0	0/ 0	60/ 1	0/ 0
CHROMORHINORRHEA	0/ 0	13/ 1	2/ 1	0/ 0	0/ 0
MOUTH: ULCERATION	0/ 0	0/ 0	6/ 1	0/ 0	0/ 0
SCANT FECES	0/ 0	0/ 0	1/ 1	0/ 0	0/ 0
EXOPHTHALMOS	0/ 0	15/ 1	0/ 0	0/ 0	0/ 0
EXCESS SALIVATION - SLIGHT	0/ 0	2/ 1	0/ 0	0/ 0	0/ 0

STATISTICAL ANALYSES OF CLINICAL OBSERVATION DATA WERE RESTRICTED TO THE NUMBER OF RATS WITH OBSERVATIONS.

MAXIMUM POSSIBLE INCIDENCE = (DAYS x RATS)/NUMBER OF RATS EXAMINED PER GROUP

N/N = TOTAL NUMBER OF OBSERVATIONS/NUMBER OF RATS WITH OBSERVATION

a. Rats were given continual access to the carrier control or test substance in the diet.

** Significantly different from the carrier group value (p≤0.01).

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 24 (PAGE 1): DETAILED CLINICAL OBSERVATIONS - SUMMARY - FEMALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP CONCENTRATION (PPM) ^a	I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
MAXIMUM POSSIBLE INCIDENCE	210/ 15	210/ 15	210/ 15	210/ 15	210/ 15
MORTALITY	0	0	0	0	0
DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL	161/ 15	141/ 15	166/ 15	131/ 15	127/ 15
DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL	22/ 8	41/ 8	16/ 7	49/ 10	56/ 12
SPARSE HAIR COAT: TOTAL	12/ 2	15/ 4	6/ 1	19/ 5	10/ 6
NECK	0/ 0	0/ 0	0/ 0	0/ 0	1/ 1
LIMB(S)	11/ 2	14/ 4	6/ 1	19/ 5	9/ 5
BACK	2/ 1	3/ 1	0/ 0	0/ 0	0/ 0
URINE-STAINED ABDOMINAL FUR	0/ 0	0/ 0	0/ 0	0/ 0	31/ 6**
UNGROOMED COAT	1/ 1	0/ 0	2/ 1	2/ 2	20/ 5
CHROMODACRYORRHEA	3/ 2	2/ 2	3/ 2	1/ 1	8/ 4
CHROMORHINORRHEA	2/ 2	1/ 1	2/ 2	1/ 1	4/ 4
RIGHT AND/OR LEFT EAR: SWOLLEN	5/ 2	6/ 1	0/ 0	5/ 3	7/ 3
INCISOR(S): TOTAL	4/ 2	1/ 1	5/ 2	10/ 2	6/ 2
MISSING/BROKEN	0/ 0	1/ 1	1/ 1	10/ 2	1/ 1
MISALIGNED	4/ 2	0/ 0	4/ 1	9/ 1	6/ 2
BACK OR TAIL: SCAB	2/ 2	0/ 0	0/ 0	2/ 2	1/ 1
LACRIMATION	1/ 1	0/ 0	1/ 1	0/ 0	5/ 1
LOCALIZED ALOPECIA: LIMB(S)	0/ 0	9/ 1	0/ 0	11/ 2	0/ 0
TAIL: BENT	0/ 0	8/ 1	0/ 0	6/ 1	0/ 0

STATISTICAL ANALYSES OF DETAILED CLINICAL OBSERVATION DATA WERE RESTRICTED TO THE NUMBER OF RATS WITH OBSERVATIONS.

MAXIMUM POSSIBLE INCIDENCE = (WEEKS x RATS)/NUMBER OF RATS EXAMINED PER GROUP

N/N = TOTAL NUMBER OF OBSERVATIONS/NUMBER OF RATS WITH OBSERVATION

a. Rats were given continual access to the carrier control or test substance in the diet.

** Significantly different from the carrier group value ($p \leq 0.01$).

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 24 (PAGE 2): DETAILED CLINICAL OBSERVATIONS - SUMMARY - FEMALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP CONCENTRATION (PPM) ^a	I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
MAXIMUM POSSIBLE INCIDENCE	210/ 15	210/ 15	210/ 15	210/ 15	210/ 15
MORTALITY	0	0	0	0	0
LEFT EAR: DARK RED	0/ 0	0/ 0	0/ 0	6/ 1	0/ 0
SNOUT: SWOLLEN	0/ 0	0/ 0	0/ 0	1/ 1	0/ 0
MOUTH: ABRASION	0/ 0	0/ 0	0/ 0	1/ 1	0/ 0
EXOPHTHALMOS	0/ 0	2/ 1	0/ 0	0/ 0	0/ 0
VOCALIZATION TO TOUCH	1/ 1	0/ 0	0/ 0	0/ 0	0/ 0

STATISTICAL ANALYSES OF DETAILED CLINICAL OBSERVATION DATA WERE RESTRICTED TO THE NUMBER OF RATS WITH OBSERVATIONS.

MAXIMUM POSSIBLE INCIDENCE = (WEEKS x RATS)/NUMBER OF RATS EXAMINED PER GROUP

N/N = TOTAL NUMBER OF OBSERVATIONS/NUMBER OF RATS WITH OBSERVATION

a. Rats were given continual access to the carrier control or test substance in the diet.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 25 (PAGE 1): BODY WEIGHTS - SUMMARY - MALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP CONCENTRATION (PPM) a		I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS TESTED		N	15	15	15	15
BODY WEIGHT (G)						
DAY 1	MEAN±S.D.	235.1 ± 11.8	231.1 ± 13.8	232.7 ± 13.8	232.6 ± 13.2	229.9 ± 13.4
DAY 8	MEAN±S.D.	304.5 ± 17.1	296.4 ± 23.4	297.3 ± 20.2	293.3 ± 20.1	271.1 ± 20.2**
DAY 15	MEAN±S.D.	364.8 ± 24.0	363.5 ± 30.9	364.9 ± 25.8	359.1 ± 26.7	333.5 ± 24.6**
DAY 22	MEAN±S.D.	416.4 ± 28.8	409.9 ± 34.8	413.4 ± 32.5	400.7 ± 32.0	370.3 ± 27.4**
DAY 29	MEAN±S.D.	468.1 ± 38.8	460.5 ± 41.6	464.1 ± 39.3	441.5 ± 37.9	409.3 ± 31.7**
DAY 36	MEAN±S.D.	501.3 ± 43.1	494.0 ± 45.3	501.1 ± 46.2	475.0 ± 41.6	440.7 ± 36.5**
DAY 43	MEAN±S.D.	529.9 ± 47.3	526.0 ± 50.1	533.3 ± 50.4	500.4 ± 45.3	466.7 ± 41.2**
DAY 50	MEAN±S.D.	564.8 ± 51.7	560.5 ± 52.2	566.6 ± 54.0	526.9 ± 47.3	493.3 ± 42.7**
DAY 57	MEAN±S.D.	589.6 ± 54.1	585.8 ± 55.8	593.1 ± 58.0	550.7 ± 50.9	515.4 ± 44.5**
DAY 64	MEAN±S.D.	607.9 ± 55.9	605.8 ± 59.5	619.1 ± 58.3	571.4 ± 51.7	534.1 ± 46.4**
DAY 71	MEAN±S.D.	625.7 ± 58.4	622.9 ± 60.0	639.1 ± 62.2	585.0 ± 53.5	547.7 ± 44.7**
DAY 78	MEAN±S.D.	636.8 ± 60.9	623.2 ± 46.8 [14]b	647.9 ± 66.1	595.7 ± 54.1	560.1 ± 47.2**
DAY 85	MEAN±S.D.	655.5 ± 62.1	647.1 ± 46.5 [14]b	664.1 ± 68.3	608.1 ± 53.3*	571.8 ± 49.1**
DAY 91	MEAN±S.D.	669.1 ± 62.6	664.8 ± 49.8 [14]b	693.6 ± 69.7 [14]b	629.0 ± 55.4	593.2 ± 49.5**

DAY = DAY OF STUDY

[] = NUMBER OF VALUES AVERAGED

a. Rats were given continual access to the carrier control or test substance in the diet.

b. Excludes values for rats that were found dead or euthanized due to adverse clinical observations.

* Significantly different from the carrier group value (p≤0.05).

** Significantly different from the carrier group value (p≤0.01).

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 26 (PAGE 1): BODY WEIGHT CHANGES - SUMMARY - MALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP CONCENTRATION (PPM) ^a		I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS TESTED	N	15	15	15	15	15
BODY WEIGHT CHANGE (G)						
DAYS 1 - 8	MEAN±S.D.	+69.4 ± 7.5	+65.3 ± 11.1	+64.6 ± 8.5	+60.7 ± 8.9*	+41.3 ± 9.8**
DAYS 8 - 15	MEAN±S.D.	+60.3 ± 15.7	+67.1 ± 9.7	+67.6 ± 8.3	+65.9 ± 9.0	+62.4 ± 7.1
DAYS 15 - 22	MEAN±S.D.	+51.6 ± 18.6	+46.4 ± 5.2	+48.5 ± 9.6	+41.6 ± 7.3	+36.7 ± 6.8**
DAYS 22 - 29	MEAN±S.D.	+51.7 ± 10.7	+50.5 ± 8.2	+50.7 ± 8.5	+40.8 ± 9.4**	+39.0 ± 6.7**
DAYS 29 - 36	MEAN±S.D.	+33.1 ± 5.6	+33.5 ± 5.6	+37.0 ± 8.8	+33.5 ± 5.8	+31.4 ± 7.1
DAYS 36 - 43	MEAN±S.D.	+28.7 ± 6.9	+32.0 ± 6.6	+32.3 ± 8.2	+25.4 ± 5.7	+26.0 ± 6.2
DAYS 43 - 50	MEAN±S.D.	+34.9 ± 6.6	+34.5 ± 6.8	+33.3 ± 6.2	+26.5 ± 11.4**	+26.7 ± 4.4**
DAYS 50 - 57	MEAN±S.D.	+24.8 ± 5.8	+25.3 ± 4.4	+26.5 ± 6.8	+23.8 ± 13.2	+22.1 ± 5.4
DAYS 57 - 64	MEAN±S.D.	+18.3 ± 5.4	+20.0 ± 5.7	+25.9 ± 4.1**	+20.7 ± 4.5	+18.7 ± 4.0
DAYS 64 - 71	MEAN±S.D.	+17.9 ± 5.8	+17.1 ± 4.9	+20.1 ± 7.2	+13.6 ± 5.2	+13.6 ± 5.1
DAYS 71 - 78	MEAN±S.D.	+11.1 ± 6.5	+11.0 ± 5.8	+8.8 ± 8.2	+10.7 ± 4.9	+12.4 ± 5.1
DAYS 78 - 85	MEAN±S.D.	+18.7 ± 8.6	+23.8 ± 5.3 [14]b	+16.1 ± 6.1	+12.4 ± 6.5*	+11.7 ± 4.8**
DAYS 85 - 91	MEAN±S.D.	+13.6 ± 5.7	+17.8 ± 7.0 [14]b	+25.1 ± 7.7** [14]b	+20.9 ± 5.8**	+21.4 ± 4.0**
DAYS 1 - 91	MEAN±S.D.	+433.9 ± 53.4	+435.0 ± 39.1 [14]b	+460.1 ± 64.4 [14]b	+396.4 ± 45.4	+363.3 ± 42.5**

DAYS = DAYS OF STUDY

[] = NUMBER OF VALUES AVERAGED

a. Rats were given continual access to the carrier control or test substance in the diet.

b. Excludes values for rats that were found dead or euthanized due to adverse clinical observations.

* Significantly different from the carrier group value (p≤0.05).

** Significantly different from the carrier group value (p≤0.01).

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 27 (PAGE 1): BODY WEIGHTS - SUMMARY - FEMALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP CONCENTRATION (PPM) ^a		I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS TESTED	N	15	15	15	15	15
BODY WEIGHT (G)						
DAY 1	MEAN±S.D.	182.5 ± 10.0	184.7 ± 11.9	180.8 ± 8.6	181.8 ± 14.3	182.8 ± 10.5
DAY 8	MEAN±S.D.	207.9 ± 12.4	211.4 ± 17.2	206.9 ± 11.9	205.9 ± 17.7	200.1 ± 13.7
DAY 15	MEAN±S.D.	232.5 ± 14.7	232.3 ± 18.3	231.3 ± 15.2	230.0 ± 20.1	221.9 ± 17.3
DAY 22	MEAN±S.D.	254.2 ± 16.4	249.9 ± 18.7	251.9 ± 19.6	249.1 ± 22.9	239.5 ± 21.6
DAY 29	MEAN±S.D.	266.9 ± 21.3	265.5 ± 22.8	268.9 ± 21.3	262.8 ± 30.0	250.1 ± 21.3
DAY 36	MEAN±S.D.	278.4 ± 23.4	280.4 ± 23.6	281.3 ± 23.2	277.2 ± 28.7	264.8 ± 24.6
DAY 43	MEAN±S.D.	291.7 ± 23.5	291.3 ± 24.6	292.7 ± 23.5	288.5 ± 28.2	275.5 ± 26.8
DAY 50	MEAN±S.D.	302.7 ± 24.5	301.0 ± 25.9	302.4 ± 26.3	297.5 ± 31.0	285.0 ± 32.1
DAY 57	MEAN±S.D.	308.5 ± 27.6	305.6 ± 27.8	310.2 ± 26.0	304.4 ± 35.8	292.7 ± 36.7
DAY 64	MEAN±S.D.	314.5 ± 29.3	314.3 ± 29.8	316.2 ± 26.9	312.1 ± 41.5	298.5 ± 41.6
DAY 71	MEAN±S.D.	320.7 ± 30.6	319.0 ± 30.1	320.9 ± 28.3	318.9 ± 42.0	302.8 ± 42.4
DAY 78	MEAN±S.D.	324.1 ± 29.7	322.9 ± 30.1	327.6 ± 30.4	323.0 ± 41.5	308.8 ± 46.7
DAY 85	MEAN±S.D.	330.6 ± 31.1	328.2 ± 31.3	332.5 ± 29.4	326.3 ± 42.3	313.9 ± 45.1
DAY 91	MEAN±S.D.	337.1 ± 33.4	339.8 ± 34.5	344.9 ± 32.3	335.1 ± 42.2	321.9 ± 47.4

DAY = DAY OF STUDY

a. Rats were given continual access to the carrier control or test substance in the diet.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 28 (PAGE 1): BODY WEIGHT CHANGES - SUMMARY - FEMALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP CONCENTRATION (PPM) a		I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS TESTED	N	15	15	15	15	15
BODY WEIGHT CHANGE (G)						
DAYS 1 - 8	MEAN±S.D.	+25.4 ± 3.8	+26.7 ± 6.8	+26.1 ± 5.6	+24.1 ± 7.1	+17.3 ± 5.6**
DAYS 8 - 15	MEAN±S.D.	+24.6 ± 5.0	+20.9 ± 6.5	+24.4 ± 7.5	+24.1 ± 6.1	+21.8 ± 6.8
DAYS 15 - 22	MEAN±S.D.	+21.7 ± 4.8	+17.7 ± 5.1	+20.7 ± 5.9	+19.1 ± 6.4	+17.5 ± 6.5
DAYS 22 - 29	MEAN±S.D.	+12.7 ± 7.3	+15.6 ± 8.4	+16.9 ± 6.8	+13.7 ± 10.7	+10.7 ± 7.6
DAYS 29 - 36	MEAN±S.D.	+11.5 ± 5.0	+14.9 ± 4.4	+12.4 ± 5.9	+14.4 ± 7.0	+14.7 ± 7.9
DAYS 36 - 43	MEAN±S.D.	+13.3 ± 4.4	+10.9 ± 3.3	+11.4 ± 3.2	+11.3 ± 3.5	+10.7 ± 4.7
DAYS 43 - 50	MEAN±S.D.	+11.0 ± 5.4	+9.7 ± 4.3	+9.7 ± 5.9	+9.0 ± 5.4	+9.5 ± 7.8
DAYS 50 - 57	MEAN±S.D.	+5.7 ± 4.7	+4.6 ± 5.8	+7.8 ± 3.7	+6.9 ± 6.5	+7.7 ± 8.5
DAYS 57 - 64	MEAN±S.D.	+6.0 ± 5.4	+8.7 ± 5.0	+6.0 ± 3.0	+7.7 ± 8.2	+5.9 ± 6.2
DAYS 64 - 71	MEAN±S.D.	+6.3 ± 4.6	+4.7 ± 4.9	+4.7 ± 3.9	+6.8 ± 3.8	+4.3 ± 3.5
DAYS 71 - 78	MEAN±S.D.	+3.4 ± 6.9	+3.9 ± 3.1	+6.7 ± 4.0	+4.1 ± 3.6	+6.0 ± 6.4
DAYS 78 - 85	MEAN±S.D.	+6.5 ± 7.3	+5.3 ± 4.0	+4.9 ± 7.0	+3.3 ± 6.0	+5.1 ± 5.4
DAYS 85 - 91	MEAN±S.D.	+6.5 ± 7.1	+11.6 ± 7.9	+12.4 ± 8.8	+8.8 ± 6.8	+8.0 ± 6.2
DAYS 1 - 91	MEAN±S.D.	+154.7 ± 27.0	+155.1 ± 31.8	+164.1 ± 28.4	+153.3 ± 33.8	+139.1 ± 40.3

DAYS = DAYS OF STUDY

a. Rats were given continual access to the carrier control or test substance in the diet.

** Significantly different from the carrier group value (p≤0.01).

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 29 (PAGE 1): ABSOLUTE FEED CONSUMPTION VALUES (G/DAY) - SUMMARY - MALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP CONCENTRATION (PPM) a		I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS TESTED	N	15	15	15	15	15
FEED CONSUMPTION (G/DAY)						
DAYS 1 - 8	MEAN±S.D.	26.0 ± 2.0	25.7 ± 2.8	25.7 ± 2.0	25.7 ± 1.8	23.0 ± 2.3**
DAYS 8 - 15	MEAN±S.D.	26.2 ± 2.4	26.0 ± 3.4	26.5 ± 2.7	26.2 ± 1.7	25.7 ± 3.0
DAYS 15 - 22	MEAN±S.D.	28.8 ± 3.8	27.7 ± 3.0	28.1 ± 2.5	27.2 ± 2.0	26.4 ± 3.8
DAYS 22 - 29	MEAN±S.D.	27.8 ± 3.2	27.3 ± 2.7	27.5 ± 2.0	26.1 ± 2.6	24.7 ± 2.2**
DAYS 29 - 36	MEAN±S.D.	28.1 ± 2.7	27.9 ± 3.3	28.4 ± 2.0	26.4 ± 2.0	25.4 ± 2.8*
DAYS 36 - 43	MEAN±S.D.	27.2 ± 2.8	28.2 ± 3.4	28.3 ± 2.4	26.2 ± 2.0	25.2 ± 2.6
DAYS 43 - 50	MEAN±S.D.	27.0 ± 2.6	27.3 ± 3.1	28.5 ± 2.4	26.3 ± 2.3	24.3 ± 2.2*
DAYS 50 - 57	MEAN±S.D.	27.3 ± 3.0	27.2 ± 2.9	28.4 ± 2.4	26.2 ± 2.4	24.9 ± 2.4*
DAYS 57 - 64	MEAN±S.D.	27.6 ± 2.8	27.7 ± 2.8	28.7 ± 2.4	26.1 ± 2.2	24.8 ± 2.3**
DAYS 64 - 71	MEAN±S.D.	26.5 ± 2.8	26.8 ± 2.9	28.4 ± 2.4	25.4 ± 2.1	24.2 ± 1.6*
DAYS 71 - 78	MEAN±S.D.	25.4 ± 4.6	25.8 ± 2.8	26.8 ± 2.8	25.1 ± 1.9	24.4 ± 2.3
DAYS 78 - 85	MEAN±S.D.	25.2 ± 3.0	25.9 ± 2.0	27.6 ± 2.6*	25.4 ± 2.4	24.1 ± 2.3
DAYS 85 - 91	MEAN±S.D.	25.7 ± 3.9	26.8 ± 2.8	27.3 ± 2.5	25.0 ± 2.2	24.1 ± 2.1
DAYS 1 - 91	MEAN±S.D.	26.8 ± 2.6	26.6 ± 2.2	27.9 ± 2.2	26.0 ± 1.8	24.7 ± 2.1*

DAYS = DAYS OF STUDY

[] = NUMBER OF VALUES AVERAGED

a. Rats were given continual access to the carrier control or test substance in the diet.

b. Excludes values that were not recorded, as well as those associated with spillage.

c. Excludes values for rats that were found dead or euthanized due to adverse clinical observations.

* Significantly different from the carrier group value (p≤0.05).

** Significantly different from the carrier group value (p≤0.01).

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 30 (PAGE 1): RELATIVE FEED CONSUMPTION VALUES (G/KG/DAY) - SUMMARY - MALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP CONCENTRATION (PPM) a		I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS TESTED	N	15	15	15	15	15
FEED CONSUMPTION (G/KG/DAY)						
DAYS 1 - 8	MEAN±S.D.	96.1 ± 3.9	96.8 ± 5.0	96.8 ± 4.5	98.3 ± 4.0	93.9 ± 6.1
DAYS 8 - 15	MEAN±S.D.	78.3 ± 6.0	78.5 ± 4.5	80.1 ± 6.0	80.4 ± 3.7	84.8 ± 7.1**
DAYS 15 - 22	MEAN±S.D.	73.6 ± 8.2	71.5 ± 3.3	72.3 ± 3.9	71.6 ± 3.1	74.8 ± 7.3
DAYS 22 - 29	MEAN±S.D.	62.9 ± 4.2	62.7 ± 2.2	62.7 ± 2.8	62.1 ± 4.2	63.3 ± 3.7
DAYS 29 - 36	MEAN±S.D.	57.9 ± 2.8	58.3 ± 3.3	59.0 ± 2.4	58.1 ± 3.0	59.8 ± 3.6
DAYS 36 - 43	MEAN±S.D.	52.7 ± 2.4	55.2 ± 2.7*	54.8 ± 2.1	53.9 ± 2.6	55.6 ± 3.7**
DAYS 43 - 50	MEAN±S.D.	49.4 ± 2.4	50.2 ± 1.9	52.0 ± 3.4	51.3 ± 2.6	51.2 ± 2.4
DAYS 50 - 57	MEAN±S.D.	47.2 ± 2.3	47.5 ± 1.6	49.1 ± 3.3	48.7 ± 2.9	49.4 ± 2.3
DAYS 57 - 64	MEAN±S.D.	46.0 ± 1.8	46.5 ± 1.6	47.5 ± 2.4	46.6 ± 2.6	47.3 ± 2.3
DAYS 64 - 71	MEAN±S.D.	43.0 ± 2.0	43.6 ± 1.2	45.2 ± 2.4	44.0 ± 2.7	44.8 ± 2.6
DAYS 71 - 78	MEAN±S.D.	40.0 ± 5.8	41.8 ± 2.7	41.7 ± 2.9	42.7 ± 3.1	44.1 ± 2.4**
DAYS 78 - 85	MEAN±S.D.	39.0 ± 3.1	40.8 ± 1.4	42.2 ± 3.0**	42.3 ± 3.0**	42.6 ± 1.9**
DAYS 85 - 91	MEAN±S.D.	38.9 ± 4.8	40.9 ± 2.4	40.2 ± 2.8	40.5 ± 2.2	41.3 ± 1.6
DAYS 1 - 91	MEAN±S.D.	61.0 ± 2.7	61.8 ± 1.9	62.9 ± 2.7	62.4 ± 2.6	63.5 ± 2.5

DAYS = DAYS OF STUDY

[] = NUMBER OF VALUES AVERAGED

a. Rats were given continual access to the carrier control or test substance in the diet.

b. Excludes values that were not recorded, as well as those associated with spillage.

c. Excludes values for rats that were found dead or euthanized due to adverse clinical observations.

* Significantly different from the carrier group value (p≤0.05).

** Significantly different from the carrier group value (p≤0.01).

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 31 (PAGE 1): FEED EFFICIENCY - SUMMARY - MALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP CONCENTRATION (PPM) ^a		I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS TESTED		15	15	15	15	15
FEED EFFICIENCY (%) ^b						
DAYS 1 - 8	MEAN±S.D.	38.1 ± 2.4	36.0 ± 2.9	35.8 ± 2.9	33.5 ± 3.4**	25.4 ± 4.5**
DAYS 8 - 15	MEAN±S.D.	33.1 ± 8.0	36.9 ± 3.0	36.3 ± 2.2	35.8 ± 3.3	34.7 ± 2.8
DAYS 15 - 22	MEAN±S.D.	25.5 ± 7.8	24.0 ± 2.3	24.4 ± 3.6	21.7 ± 2.8	19.9 ± 3.2*
DAYS 22 - 29	MEAN±S.D.	26.3 ± 3.5 [14]c	26.3 ± 2.8	26.2 ± 2.9	22.2 ± 4.4**	22.4 ± 2.6**
DAYS 29 - 36	MEAN±S.D.	16.7 ± 1.6	17.1 ± 2.3	18.4 ± 3.5	17.7 ± 2.5 [14]c	17.4 ± 2.7
DAYS 36 - 43	MEAN±S.D.	14.9 ± 2.7	16.0 ± 2.2	16.1 ± 3.3	13.7 ± 2.5	14.5 ± 2.5
DAYS 43 - 50	MEAN±S.D.	18.3 ± 2.5	18.0 ± 3.2	16.5 ± 2.1	14.2 ± 5.8*	15.6 ± 2.0* [14]c
DAYS 50 - 57	MEAN±S.D.	12.9 ± 2.3	13.2 ± 1.3	13.2 ± 2.7	12.8 ± 6.8	12.6 ± 2.7
DAYS 57 - 64	MEAN±S.D.	9.5 ± 2.5	10.2 ± 2.5	12.9 ± 2.0**	11.3 ± 2.6	10.7 ± 2.0
DAYS 64 - 71	MEAN±S.D.	9.5 ± 2.7	9.1 ± 2.7	9.9 ± 2.9	7.5 ± 2.6	7.9 ± 3.0
DAYS 71 - 78	MEAN±S.D.	5.7 ± 4.1	5.9 ± 2.8 [14]d	4.4 ± 4.5	5.9 ± 2.6	7.1 ± 2.6
DAYS 78 - 85	MEAN±S.D.	10.2 ± 5.0	13.2 ± 2.9* [14]d	8.2 ± 2.6	6.9 ± 3.5*	6.8 ± 2.6*
DAYS 85 - 91	MEAN±S.D.	8.6 ± 3.2	10.8 ± 3.7 [14]d	15.2 ± 4.3** [14]d	13.9 ± 3.6**	14.9 ± 2.9**
DAYS 1 - 91	MEAN±S.D.	17.9 ± 0.7	18.2 ± 0.9 [14]d	18.2 ± 1.4 [14]d	16.9 ± 1.1*	16.2 ± 1.0**

DAYS = DAYS OF STUDY

[] = NUMBER OF VALUES AVERAGED

a. Rats were given continual access to the carrier control or test substance in the diet.

b. FEED EFFICIENCY = [(AVERAGE G/DAY OF BODY WEIGHT CHANGE) / (AVERAGE G/DAY OF FEED CONSUMPTION)] * 100

c. Excludes values that were not recorded, as well as those associated with spillage.

d. Excludes values for rats that were found dead or euthanized due to adverse clinical observations.

* Significantly different from the carrier group value (p≤0.05).

** Significantly different from the carrier group value (p≤0.01).

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 32 (PAGE 1): ABSOLUTE FEED CONSUMPTION VALUES (G/DAY) - SUMMARY - FEMALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP CONCENTRATION (PPM) ^a		I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS TESTED	N	15	15	15	15	15
FEED CONSUMPTION (G/DAY)						
DAYS 1 - 8	MEAN±S.D.	18.1 ± 1.9	18.0 ± 2.0	17.3 ± 1.7 [14]b	17.0 ± 2.1	15.8 ± 1.5**
DAYS 8 - 15	MEAN±S.D.	19.3 ± 4.8	17.2 ± 1.6	18.0 ± 1.8	17.8 ± 2.1	18.0 ± 2.8
DAYS 15 - 22	MEAN±S.D.	18.5 ± 2.1	18.6 ± 3.4	18.1 ± 1.8 [13]b	19.2 ± 3.0 [14]b	17.5 ± 1.8 [12]b
DAYS 22 - 29	MEAN±S.D.	17.6 ± 2.2	17.8 ± 2.5	18.2 ± 2.2	17.9 ± 2.6 [14]b	17.2 ± 2.0
DAYS 29 - 36	MEAN±S.D.	18.7 ± 2.7	18.9 ± 4.0	18.5 ± 2.0	18.3 ± 1.8	17.8 ± 2.0
DAYS 36 - 43	MEAN±S.D.	18.4 ± 2.2 [14]b	17.2 ± 2.0	18.3 ± 2.4 [14]b	17.6 ± 1.9	17.8 ± 3.0
DAYS 43 - 50	MEAN±S.D.	17.6 ± 2.3 [14]b	16.6 ± 1.8	17.6 ± 1.9	17.1 ± 1.8 [14]b	16.5 ± 2.3
DAYS 50 - 57	MEAN±S.D.	17.1 ± 2.2	16.2 ± 1.8	16.8 ± 2.0	16.6 ± 2.2	15.9 ± 1.8 [14]b
DAYS 57 - 64	MEAN±S.D.	16.9 ± 1.7	16.3 ± 1.8	16.8 ± 1.8	16.8 ± 3.1	16.3 ± 3.1 [14]b
DAYS 64 - 71	MEAN±S.D.	16.5 ± 2.0	15.6 ± 1.8	16.5 ± 2.0 [14]b	16.4 ± 2.4	15.7 ± 2.8
DAYS 71 - 78	MEAN±S.D.	16.2 ± 2.0	15.9 ± 1.8	16.5 ± 1.8	16.0 ± 1.6	15.9 ± 2.7
DAYS 78 - 85	MEAN±S.D.	17.5 ± 6.4	15.6 ± 2.0	16.2 ± 1.9	15.7 ± 1.7	15.5 ± 2.1
DAYS 85 - 91	MEAN±S.D.	15.5 ± 2.3	15.3 ± 1.7	16.2 ± 1.6	15.2 ± 1.9	15.0 ± 2.2
DAYS 1 - 91	MEAN±S.D.	17.6 ± 1.9	16.9 ± 1.7	17.3 ± 1.6	17.0 ± 1.9	16.6 ± 1.8

DAYS = DAYS OF STUDY

[] = NUMBER OF VALUES AVERAGED

a. Rats were given continual access to the carrier control or test substance in the diet.

b. Excludes values that were associated with spillage.

** Significantly different from the carrier group value (p≤0.01).

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 33 (PAGE 1): RELATIVE FEED CONSUMPTION VALUES (G/KG/DAY) - SUMMARY - FEMALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP CONCENTRATION (PPM) ^a		I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS TESTED	N	15	15	15	15	15
FEED CONSUMPTION (G/KG/DAY)						
DAYS 1 - 8	MEAN±S.D.	92.5 ± 9.5	91.0 ± 5.6	89.4 ± 7.9 [14]b	87.9 ± 6.0	84.2 ± 6.1**
DAYS 8 - 15	MEAN±S.D.	87.8 ± 22.7	77.4 ± 4.6	82.1 ± 6.9	81.4 ± 5.6	85.6 ± 12.8
DAYS 15 - 22	MEAN±S.D.	75.9 ± 6.2	77.1 ± 13.3	75.4 ± 6.2 [13]b	79.5 ± 6.7 [14]b	76.2 ± 4.5 [12]b
DAYS 22 - 29	MEAN±S.D.	67.5 ± 6.0	69.0 ± 6.8	70.0 ± 6.7	69.3 ± 6.7 [14]b	70.1 ± 5.8
DAYS 29 - 36	MEAN±S.D.	68.6 ± 8.1	69.0 ± 12.4	67.3 ± 5.5	68.1 ± 4.0	69.1 ± 4.7
DAYS 36 - 43	MEAN±S.D.	64.2 ± 5.2 [14]b	60.4 ± 5.1	63.8 ± 6.7 [14]b	62.5 ± 4.2	66.3 ± 12.6
DAYS 43 - 50	MEAN±S.D.	59.2 ± 4.9 [14]b	56.2 ± 3.8	59.4 ± 6.0	57.6 ± 3.3 [14]b	58.7 ± 4.3
DAYS 50 - 57	MEAN±S.D.	56.1 ± 5.6	53.3 ± 3.9	55.1 ± 5.8	55.1 ± 3.2	56.2 ± 3.3 [14]b
DAYS 57 - 64	MEAN±S.D.	54.4 ± 3.7	52.7 ± 3.9	53.6 ± 5.2	54.2 ± 4.3	55.4 ± 4.3 [14]b
DAYS 64 - 71	MEAN±S.D.	52.0 ± 4.4	49.5 ± 4.4	51.6 ± 5.0 [14]b	51.9 ± 2.8	52.2 ± 3.8
DAYS 71 - 78	MEAN±S.D.	50.4 ± 4.5	49.6 ± 4.5	51.0 ± 4.1	50.2 ± 3.8	52.1 ± 3.7
DAYS 78 - 85	MEAN±S.D.	53.4 ± 18.9	48.0 ± 4.2	49.4 ± 6.0	48.5 ± 4.0	50.0 ± 3.2
DAYS 85 - 91	MEAN±S.D.	46.3 ± 5.0	45.8 ± 3.1	48.0 ± 4.3	46.1 ± 4.6	47.3 ± 2.9
DAYS 1 - 91	MEAN±S.D.	68.4 ± 5.2	65.9 ± 4.3	67.6 ± 4.8	67.1 ± 2.4	68.0 ± 3.3

DAYS = DAYS OF STUDY

[] = NUMBER OF VALUES AVERAGED

a. Rats were given continual access to the carrier control or test substance in the diet.

b. Excludes values that were associated with spillage.

** Significantly different from the carrier group value (p≤0.01).

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 34 (PAGE 1): FEED EFFICIENCY - SUMMARY - FEMALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP CONCENTRATION (PPM) ^a		I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS TESTED		15	15	15	15	15
FEED EFFICIENCY (%) ^b						
DAYS 1 - 8	MEAN±S.D.	20.0 ± 2.8	20.9 ± 3.9	21.3 ± 4.0 [14]c	19.9 ± 4.9	15.3 ± 3.9**
DAYS 8 - 15	MEAN±S.D.	18.5 ± 3.4	17.2 ± 5.0	19.2 ± 5.1	19.2 ± 3.2	17.4 ± 5.3
DAYS 15 - 22	MEAN±S.D.	16.6 ± 3.4	13.6 ± 3.8	15.7 ± 3.6 [13]c	14.2 ± 3.7 [14]c	14.0 ± 4.6 [12]c
DAYS 22 - 29	MEAN±S.D.	9.8 ± 5.2	11.8 ± 5.2	13.0 ± 4.2	10.5 ± 7.4 [14]c	8.7 ± 6.1
DAYS 29 - 36	MEAN±S.D.	8.5 ± 2.9	11.4 ± 3.6	9.5 ± 4.2	11.1 ± 5.0	11.6 ± 5.9
DAYS 36 - 43	MEAN±S.D.	10.4 ± 3.6 [14]c	8.8 ± 2.5	9.0 ± 2.6 [14]c	9.2 ± 3.1	8.5 ± 3.2
DAYS 43 - 50	MEAN±S.D.	8.8 ± 4.0 [14]c	8.2 ± 3.4	7.6 ± 4.2	7.6 ± 3.9 [14]c	7.5 ± 6.0
DAYS 50 - 57	MEAN±S.D.	4.5 ± 3.9	3.8 ± 4.9	6.4 ± 2.7	5.4 ± 4.8	4.9 ± 3.5 [14]c
DAYS 57 - 64	MEAN±S.D.	4.9 ± 4.3	7.4 ± 4.3	4.9 ± 2.4	5.9 ± 4.7	4.9 ± 4.3 [14]c
DAYS 64 - 71	MEAN±S.D.	5.1 ± 3.5	4.0 ± 4.0	3.6 ± 3.2 [14]c	5.8 ± 3.0	3.7 ± 2.8
DAYS 71 - 78	MEAN±S.D.	2.7 ± 6.3	3.3 ± 2.8	5.7 ± 3.3	3.5 ± 3.3	4.8 ± 5.2
DAYS 78 - 85	MEAN±S.D.	5.3 ± 6.7	4.7 ± 3.6	3.8 ± 6.8	2.7 ± 5.0	4.6 ± 4.6
DAYS 85 - 91	MEAN±S.D.	6.5 ± 8.1	12.4 ± 8.5	12.4 ± 8.2	9.5 ± 6.5	8.6 ± 5.8
DAYS 1 - 91	MEAN±S.D.	9.7 ± 1.0	10.1 ± 1.6	10.5 ± 1.4	10.0 ± 1.4	9.1 ± 1.7

DAYS = DAYS OF STUDY

[] = NUMBER OF VALUES AVERAGED

a. Rats were given continual access to the carrier control or test substance in the diet.

b. FEED EFFICIENCY = [(AVERAGE G/DAY OF BODY WEIGHT CHANGE) / (AVERAGE G/DAY OF FEED CONSUMPTION)] * 100

c. Excludes values that were associated with spillage.

** Significantly different from the carrier group value (p≤0.01).

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 35 (PAGE 1): NECROPSY OBSERVATIONS - SUMMARY - MALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP CONCENTRATION (PPM) a		I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS EXAMINED	N	15	15	15	15	15
MORTALITY	N	0	1	1	0	0
FOUND DEAD	N	0	1 ^b	0	0	0
UNSCHEDULED EUTHANASIA	N	0	0	1 ^c	0	0
APPEARED NORMAL	N	15	13	14	14	15
THYMUS:						
DARK RED	N	0	0	0	1	0
KIDNEYS:						
RIGHT, PELVIS, SLIGHT DILATION	N	0	2	1	0	0

a. Rats were given continual access to the carrier control or test substance in the diet.

b. Rat 3747 was found dead on Day 77 of study.

c. Rat 3819 was euthanized on Day 86 of study due to adverse clinical observations.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 36 (PAGE 1): NECROPSY OBSERVATIONS - SUMMARY - FEMALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP CONCENTRATION (PPM) a	I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS EXAMINED	N 15	15	15	15	15
MORTALITY	N 0	0	0	0	0
APPEARED NORMAL	N 15	15	15	15	15

a. Rats were given continual access to the carrier control or test substance in the diet.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 37 (PAGE 1): BRAIN CHOLINESTERASE LEVELS - SUMMARY - MALE RATS

DOSAGE GROUP		I	II	III	IV	V
CONCENTRATION (PPM) ^a		0 (CARRIER CONTROL)	100	500	5000	10000
RATS TESTED	N	15	15	15	15	15
INCLUDED IN ANALYSES	N	14 ^b	14 ^c	14 ^c	14 ^b	15
BRAIN WEIGHT (G)	MEAN±S.D.	2.053 ± 0.104	2.017 ± 0.119	2.039 ± 0.078	1.997 ± 0.117	1.955 ± 0.123
CHOLINESTERASE LEVELS (UNITS/G)	MEAN±S.D.	14.573 ± 0.878	14.963 ± 0.791	14.505 ± 0.537	12.049 ± 0.635**	11.936 ± 1.019**
% CONTROL	%	-	102.7	99.5	82.7	81.9

a. Rats were given continual access to the carrier control or test substance in the diet.

b. Excludes values for rats with questionable brain weights.

c. Excludes rats that were found dead or euthanized due to adverse clinical observations.

** Significantly different from the carrier control group value ($p \leq 0.01$).

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 38 (PAGE 1): BRAIN CHOLINESTERASE LEVELS - SUMMARY - FEMALE RATS

DOSAGE GROUP		I	II	III	IV	V
CONCENTRATION (PPM) ^a		0 (CARRIER CONTROL)	100	500	5000	10000
RATS TESTED	N	15	15	15	15	15
BRAIN WEIGHT (G)	MEAN±S.D.	1.935 ± 0.077	1.919 ± 0.075	1.902 ± 0.091	1.874 ± 0.082	1.925 ± 0.061
CHOLINESTERASE LEVELS (UNITS/G)	MEAN±S.D.	14.540 ± 0.775	14.893 ± 0.573	14.204 ± 0.826	11.382 ± 0.877**	7.341 ± 1.806**
% CONTROL	%	-	102.4	97.7	78.3	50.5

a. Rats were given continual access to the carrier control or test substance in the diet.

** Significantly different from the carrier control group value ($p \leq 0.01$).

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 39 (PAGE 1): RBC CHOLINESTERASE LEVELS - SUMMARY - MALE RATS

DOSAGE GROUP		I	II	III	IV	V
CONCENTRATION (PPM) ^a		0 (CARRIER CONTROL)	100	500	5000	10000
RATS TESTED	N	15	15	15	15	15
INCLUDED IN ANALYSES	N	14 ^b	13 ^{b,c}	12 ^{b-d}	14 ^b	9 ^{b,d,e}
CHOLINESTERASE LEVELS (UNITS/ML)	MEAN±S.D.	1.756 ± 0.172	1.626 ± 0.219	1.469 ± 0.275**	0.476 ± 0.195**	0.255 ± 0.104**
% CONTROL	%	-	92.6	83.7	27.1	14.5

a. Rats were given continual access to the carrier control or test substance in the diet.

b. Excludes rats that did not have an RBC sample analyzed.

c. Excludes rats that were found dead or euthanized due to adverse clinical observations.

d. Excludes values for rats that had a sample that was improperly labeled.

e. Excludes rats that had values that did not meet the acceptability or reproducibility criteria.

** Significantly different from the carrier control group value ($p \leq 0.01$).

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 40 (PAGE 1): RBC CHOLINESTERASE LEVELS - SUMMARY - FEMALE RATS

DOSAGE GROUP		I	II	III	IV	V
CONCENTRATION (PPM) ^a		0 (CARRIER CONTROL)	100	500	5000	10000
RATS TESTED	N	15	15	15	15	15
INCLUDED IN ANALYSES	N	15	15	15	14 ^b	13 ^c
CHOLINESTERASE LEVELS (UNITS/ML)	MEAN±S.D.	1.700 ± 0.146	1.527 ± 0.165*	1.367 ± 0.293**	0.353 ± 0.111**	0.244 ± 0.145**
% CONTROL	%	-	89.8	80.4	20.8	14.4

a. Rats were given continual access to the carrier control or test substance in the diet.

b. Excludes values for rat 3972, which had a questionable value.

c. Excludes rats that had values that did not meet the acceptability or reproducibility criteria.

* Significantly different from the carrier control group value ($p \leq 0.05$).

** Significantly different from the carrier control group value ($p \leq 0.01$).

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 41 (PAGE 1): CLINICAL OBSERVATIONS - INDIVIDUAL DATA - MALE RATS - MAIN STUDY

RAT #		DESCRIPTION
DOSAGE GROUP I		0 (CARRIER CONTROL) PPM
3776		NO ADVERSE FINDINGS
3777		NO ADVERSE FINDINGS
3778		NO ADVERSE FINDINGS
3779		NO ADVERSE FINDINGS
3780		NO ADVERSE FINDINGS
3781		NO ADVERSE FINDINGS
3782	DS (37- 38)	INCISOR(S): MISSING/BROKEN
	DS (72- 77)	INCISOR(S): MISSING/BROKEN
3783		NO ADVERSE FINDINGS
3784	DS (43- 46)	CHROMORHINORRHEA
3785		NO ADVERSE FINDINGS
DOSAGE GROUP II		100 PPM
3726		NO ADVERSE FINDINGS
3727	DS (54- 56)	CHROMODACRYORRHEA
	DS (59- 63)	CHROMODACRYORRHEA
3728		NO ADVERSE FINDINGS
3729		NO ADVERSE FINDINGS
3730	DS (50- 72)	SPARSE HAIR COAT: LIMB(S)
	DS (73- 91)	LOCALIZED ALOPECIA: LIMB(S) a
3731		NO ADVERSE FINDINGS
3732		NO ADVERSE FINDINGS
3733	DS (10- 14)	CHROMODACRYORRHEA
	DS (37- 39)	CHROMODACRYORRHEA
	DS (87- 90)	CHROMODACRYORRHEA
3734		NO ADVERSE FINDINGS
3735		NO ADVERSE FINDINGS

CLINICAL OBSERVATIONS APPEARED NORMAL UNLESS NOTED OTHERWISE

DS = DAY OF STUDY

a. Observation confirmed at necropsy.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 41 (PAGE 2): CLINICAL OBSERVATIONS - INDIVIDUAL DATA - MALE RATS - MAIN STUDY

RAT #		DESCRIPTION
DOSAGE GROUP III		500 PPM
3801		NO ADVERSE FINDINGS
3802		NO ADVERSE FINDINGS
3803	DS(19- 21)	SPARSE HAIR COAT: NECK
3804	DS(21)	RIGHT EAR: SWOLLEN
3805	DS(48- 49)	EXCESS SALIVATION - SLIGHT
12250	DS(3)	CHROMORHINORRHEA
	DS(10- 28)	NECK: ABRASION (0.4 CM X 0.4 CM)
	DS(29- 30)	NECK: SCAB (0.5 CM IN DIAMETER)
3807		NO ADVERSE FINDINGS
3808		NO ADVERSE FINDINGS
3809	DS(24- 91)	LOCALIZED ALOPECIA: LIMB(S) a
3810		NO ADVERSE FINDINGS
DOSAGE GROUP IV		5000 PPM
3751		NO ADVERSE FINDINGS
3752		NO ADVERSE FINDINGS
3753		NO ADVERSE FINDINGS
3754		NO ADVERSE FINDINGS
3755	DS(34- 91)	TAIL: BENT a
3756		NO ADVERSE FINDINGS
3757	DS(47- 63)	SPARSE HAIR COAT: LIMB(S)
3758		NO ADVERSE FINDINGS
3759		NO ADVERSE FINDINGS
3760		NO ADVERSE FINDINGS
DOSAGE GROUP V		10000 PPM
3701	DS(3- 4)	DEHYDRATION - MILD c
18077		NO ADVERSE FINDINGS
3703		NO ADVERSE FINDINGS
3704		NO ADVERSE FINDINGS
3705	DS(50- 59)	SPARSE HAIR COAT: LIMB(S)
3706b	DS(2- 12)	TAIL: BENT
	DS(14- 91)	TAIL: BENT a
3707b	DS(33- 91)	UMBILICAL HERNIA a
3708b		NO ADVERSE FINDINGS
3709b	DS(2- 5)	DEHYDRATION - MILD c
3710b	DS(2- 3)	DEHYDRATION - MILD c

CLINICAL OBSERVATIONS APPEARED NORMAL UNLESS NOTED OTHERWISE

DS = DAY OF STUDY

- Observation confirmed at necropsy.
- Clinical observations were not recorded on Day 13 of study.
- Dehydration was verified using a skin turgor test; this test is only conducted on rats based on other clinical signs and/or a reduction in body weight/feed consumption. Therefore, this clinical observation was not summarized or statistically analyzed.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 42 (PAGE 1): DETAILED CLINICAL OBSERVATIONS - INDIVIDUAL DATA - MALE RATS - MAIN STUDY

DOSAGE GROUP I		0 (CARRIER CONTROL) PPM
RAT #		DESCRIPTION
3776	WS(1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3777	WS(1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3778	WS(1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3779	WS(1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3780	WS(1- 7)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(8)	CHROMODACRYORRHEA
	WS(8)	LACRIMATION
	WS(8)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(9- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3781	WS(1)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(1)	UNGROOMED COAT
	WS(1- 10)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(11)	CHROMORHINORRHEA
	WS(11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(12- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3782	WS(1)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(2)	BACK: SCAB (0.5 CM X 0.5 CM)
	WS(2)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(3- 9)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(10- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(10- 11)	INCISOR(S): MISSING/BROKEN
	WS(12- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3783	WS(1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3784	WS(1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3785	WS(1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL

WS = WEEK OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 42 (PAGE 2): DETAILED CLINICAL OBSERVATIONS - INDIVIDUAL DATA - MALE RATS - MAIN STUDY

DOSAGE GROUP II		100 PPM
RAT #		DESCRIPTION
3726	WS (1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3727	WS (1- 7)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS (8- 9)	CHROMODACRYORRHEA
	WS (8- 9)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS (9)	LACRIMATION
	WS (10- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3728	WS (1- 6)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS (7- 13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS (7- 13)	TAIL: BENT
	WS (11)	CHROMORHINORRHEA
3729	WS (1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3730	WS (1- 3)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS (4- 7)	SPARSE HAIR COAT: LIMB(S)
	WS (4- 13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS (8- 13)	LOCALIZED ALOPECIA: LIMB(S)
	WS (11- 13)	SPARSE HAIR COAT: LIMB(S)
3731	WS (1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3732	WS (1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3733	WS (1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS (12- 13)	CHROMODACRYORRHEA
	WS (12- 13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
3734	WS (1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3735	WS (1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL

WS = WEEK OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 42 (PAGE 3): DETAILED CLINICAL OBSERVATIONS - INDIVIDUAL DATA - MALE RATS - MAIN STUDY

DOSAGE GROUP III		500 PPM
RAT #		DESCRIPTION
3801	WS(1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3802	WS(1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3803	WS(1)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(2)	NECK: SCAB (0.5 CM X 0.5 CM)
	WS(2)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(3- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3804	WS(1)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(2- 9)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(2- 9)	BOTH EARS: SWOLLEN
	WS(10- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3805	WS(1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
12250	WS(1)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(2)	NECK, RIGHT SIDE: ULCERATION (1.0 CM IN DIAMETER)
	WS(2- 4)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(3- 4)	NECK, RIGHT SIDE: SCAB (1.0 CM IN DIAMETER)
	WS(5- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3807	WS(1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3808	WS(1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3809	WS(1- 3)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(4- 5)	SPARSE HAIR COAT: LIMB(S)
	WS(4- 13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(6- 11)	LOCALIZED ALOPECIA: LIMB(S)
	WS(12)	UNGROOMED COAT
	WS(13)	LOCALIZED ALOPECIA: LIMB(S)
3810	WS(1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL

WS = WEEK OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 42 (PAGE 4): DETAILED CLINICAL OBSERVATIONS - INDIVIDUAL DATA - MALE RATS - MAIN STUDY

DOSAGE GROUP IV		5000 PPM
RAT #		DESCRIPTION
3751	WS (1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3752	WS (1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3753	WS (1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3754	WS (1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3755	WS (1- 3)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS (4- 13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS (4- 13)	TAIL: BENT
3756	WS (1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3757	WS (1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3758	WS (1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3759	WS (1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3760	WS (1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL

WS = WEEK OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 42 (PAGE 5): DETAILED CLINICAL OBSERVATIONS - INDIVIDUAL DATA - MALE RATS - MAIN STUDY

DOSAGE GROUP V		10000 PPM
RAT #		DESCRIPTION
3701	WS (1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
18077	WS (1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3703	WS (1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3704	WS (1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3705	WS (1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3706	WS (1- 13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS (1- 13)	TAIL: BENT
3707	WS (1- 3)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS (4- 13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS (4- 13)	UMBILICAL HERNIA
3708	WS (1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3709	WS (1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3710	WS (1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL

WS = WEEK OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 43 (PAGE 1): CLINICAL OBSERVATIONS - INDIVIDUAL DATA - FEMALE RATS - MAIN STUDY

RAT #		DESCRIPTION
DOSAGE GROUP I		0 (CARRIER CONTROL) PPM
3901	DS (64- 77)	SPARSE HAIR COAT: LIMB(S)
	DS (78- 91)	LOCALIZED ALOPECIA: LIMB(S) a
3902		NO ADVERSE FINDINGS
3903		NO ADVERSE FINDINGS
3904		NO ADVERSE FINDINGS
3905		NO ADVERSE FINDINGS
3906	DS (57- 59)	SNOUT: SWOLLEN
	DS (57- 59)	INCISOR(S): MISSING/BROKEN
3907		NO ADVERSE FINDINGS
3908		NO ADVERSE FINDINGS
3909		NO ADVERSE FINDINGS
3910		NO ADVERSE FINDINGS
DOSAGE GROUP II		100 PPM
3851		NO ADVERSE FINDINGS
3852		NO ADVERSE FINDINGS
3853		NO ADVERSE FINDINGS
3854		NO ADVERSE FINDINGS
3855		NO ADVERSE FINDINGS
3856	DS (78- 91)	BOTH EARS: SWOLLEN a
3857		NO ADVERSE FINDINGS
3858	DS (14- 23)	TAIL: BENT
	DS (25- 91)	TAIL: BENT a
3859	DS (70- 84)	SPARSE HAIR COAT: LIMB(S)
	DS (85- 91)	LOCALIZED ALOPECIA: LIMB(S) a
3860	DS (84- 87)	CHROMODACRYORRHEA

CLINICAL OBSERVATIONS APPEARED NORMAL UNLESS NOTED OTHERWISE

DS = DAY OF STUDY

a. Observation confirmed at necropsy.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 43 (PAGE 2): CLINICAL OBSERVATIONS - INDIVIDUAL DATA - FEMALE RATS - MAIN STUDY

RAT #		DESCRIPTION
DOSAGE GROUP III		500 PPM
3926		NO ADVERSE FINDINGS
3927		NO ADVERSE FINDINGS
3928		NO ADVERSE FINDINGS
3929		NO ADVERSE FINDINGS
3930		NO ADVERSE FINDINGS
3931	DS (9- 13)	NECK: SCAB (0.3 CM X 0.3 CM)
	DS (85- 87)	CHROMODACRYORRHEA
3932	DS (28- 91)	SPARSE HAIR COAT: LIMB(S) a
3933		NO ADVERSE FINDINGS
3934		NO ADVERSE FINDINGS
3935		NO ADVERSE FINDINGS
DOSAGE GROUP IV		5000 PPM
3951	DS (43- 48)	INCISOR(S): MISSING/BROKEN
	DS (64- 74)	CHROMODACRYORRHEA
	DS (64- 91)	INCISOR(S): MISALIGNED a
3952		NO ADVERSE FINDINGS
3953	DS (58- 91)	LOWER MIDLINE: MASS (0.6 CM X 0.6 CM X 0.3)
3954		NO ADVERSE FINDINGS
3955		NO ADVERSE FINDINGS
3956		NO ADVERSE FINDINGS
3957		NO ADVERSE FINDINGS
3958		NO ADVERSE FINDINGS
3959	DS (31- 91)	TAIL: BENT a
	DS (64)	CHROMORHINORRHEA
3960	DS (64- 77)	INCISOR(S): MISSING/BROKEN
DOSAGE GROUP V		10000 PPM
3876		NO ADVERSE FINDINGS
3877	DS (79- 91)	URINE-STAINED ABDOMINAL FUR
3878	DS (42- 44)	CHROMORHINORRHEA
3879		NO ADVERSE FINDINGS
3880	DS (46- 91)	SPARSE HAIR COAT: LIMB(S) a
3881		NO ADVERSE FINDINGS
3882		NO ADVERSE FINDINGS
3883		NO ADVERSE FINDINGS
3884		NO ADVERSE FINDINGS
3885		NO ADVERSE FINDINGS

CLINICAL OBSERVATIONS APPEARED NORMAL UNLESS NOTED OTHERWISE

DS = DAY OF STUDY

a. Observation confirmed at necropsy.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 44 (PAGE 1): DETAILED CLINICAL OBSERVATIONS - INDIVIDUAL DATA - FEMALE RATS - MAIN STUDY

DOSAGE GROUP I		0 (CARRIER CONTROL) PPM
RAT #		DESCRIPTION
3901	WS(1- 4)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(5)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(5)	CHROMORHINORRHEA
	WS(6- 9)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(10- 13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(10- 13)	SPARSE HAIR COAT: LIMB(S)
	WS(13)	TAIL: SCAB (0.1 CM IN DIAMETER)
	WS(13)	CHROMORHINORRHEA
3902	WS(1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3903	WS(1- 8)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(9- 10)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(9- 10)	CHROMODACRYORRHEA
3904	WS(11- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3905	WS(1- 8)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(9)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(9)	CHROMORHINORRHEA
3906	WS(10- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(1- 8)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(9)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(9)	SNOUT: SWOLLEN
	WS(9)	INCISOR(S): MISSING/BROKEN
	WS(9)	INCISOR(S): MISALIGNED
	WS(10)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(11- 13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
3907	WS(11- 13)	BASE OF TAIL: SCAB (PINPOINT)
	WS(1- 3)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(4)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(4)	MOUTH: SCAB (0.2 CM IN DIAMETER)
	WS(5- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3908	WS(1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3909	WS(1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3910	WS(1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL

WS = WEEK OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 44 (PAGE 2): DETAILED CLINICAL OBSERVATIONS - INDIVIDUAL DATA - FEMALE RATS - MAIN STUDY

DOSAGE GROUP II		100 PPM
RAT #		DESCRIPTION
3851	WS(1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3852	WS(1- 3)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(4)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(4)	INCISOR(S): MISSING/BROKEN
	WS(5- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3853	WS(1)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(2)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(2)	CHROMODACRYORRHEA
	WS(3- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3854	WS(1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3855	WS(1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3856	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(12- 13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(12- 13)	BOTH EARS: SWOLLEN
	WS(13)	TAIL: BENT
3857	WS(1- 8)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(9- 10)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(9- 10)	SPARSE HAIR COAT: BACK
	WS(11- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	CHROMODACRYORRHEA
3858	WS(1- 13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(1- 13)	TAIL: BENT
3859	WS(1- 6)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(7- 13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(7- 13)	SPARSE HAIR COAT: LIMB(S)
3860	WS(1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	CHROMODACRYORRHEA
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL

WS = WEEK OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 44 (PAGE 3): DETAILED CLINICAL OBSERVATIONS - INDIVIDUAL DATA - FEMALE RATS - MAIN STUDY

DOSAGE GROUP III		500 PPM
RAT #		DESCRIPTION
3926	WS(1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3927	WS(1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3928	WS(1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3929	WS(1- 8)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(9- 13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(9- 13)	SPARSE HAIR COAT: LIMB(S)
3930	WS(1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3931	WS(1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	CHROMODACRYORRHEA
3932	WS(1- 4)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(5- 13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(5- 13)	SPARSE HAIR COAT: LIMB(S)
3933	WS(1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3934	WS(1- 4)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(5)	CHROMORHINORRHEA
	WS(5- 6)	TIP OF TAIL: RED
	WS(5- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(7- 11)	TAIL: BENT
	WS(12)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	TAIL: BENT
3935	WS(1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL

WS = WEEK OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 44 (PAGE 4): DETAILED CLINICAL OBSERVATIONS - INDIVIDUAL DATA - FEMALE RATS - MAIN STUDY

DOSAGE GROUP IV		5000 PPM
RAT #		DESCRIPTION
3951	WS(1- 6)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(7)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(7)	INCISOR(S): MISSING/BROKEN
	WS(8- 9)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(10)	DEHYDRATION - MILD a
	WS(10)	INCISOR(S): MISSING/BROKEN
	WS(10- 11)	CHROMODACRYORRHEA
	WS(10- 13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(10- 13)	INCISOR(S): MISALIGNED
	WS(11)	URINE-STAINED ABDOMINAL FUR
	WS(13)	CHROMODACRYORRHEA
3952	WS(1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3953	WS(1- 8)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(9)	LOWER MIDLINE: MASS (0.6 CM X 0.6 CM X 0.3 CM)
	WS(9- 13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
3954	WS(10- 13)	UMBILICAL HERNIA b
	WS(1- 6)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(7)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(7)	SPARSE HAIR COAT: LIMB(S)
	WS(8)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(9- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(9- 11)	SPARSE HAIR COAT: LIMB(S)
	WS(12- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	TAIL: SCAB (0.1 CM IN DIAMETER)
	WS(13)	UNGROOMED COAT
3955	WS(1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3956	WS(1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3957	WS(1- 3)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(4- 13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
3958	WS(4- 13)	RIGHT EAR: TORN
	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(12- 13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(12- 13)	INCISOR(S): MISALIGNED
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3959	WS(1- 4)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(5- 13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(5- 13)	TAIL: BENT

WS = WEEK OF STUDY

- Dehydration was verified using a skin turgor test; this test is only conducted on rats based on other clinical signs and/or a reduction in body weight/feed consumption. Therefore, this clinical observation was not summarized or statistically analyzed.
- Observation confirmed at necropsy.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 44 (PAGE 5): DETAILED CLINICAL OBSERVATIONS - INDIVIDUAL DATA - FEMALE RATS - MAIN STUDY

DOSAGE GROUP IV		5000 PPM
RAT #		DESCRIPTION
3960	WS (1- 5)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS (6)	INCISOR(S): MISSING/BROKEN
	WS (6- 7)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS (7)	CHROMODACRYORRHEA
	WS (8)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS (9)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS (9)	CHROMODACRYORRHEA
	WS (10- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL

WS = WEEK OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 44 (PAGE 6): DETAILED CLINICAL OBSERVATIONS - INDIVIDUAL DATA - FEMALE RATS - MAIN STUDY

DOSAGE GROUP V		10000 PPM
RAT #		DESCRIPTION
3876	WS (1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3877	WS (1- 8)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS (9- 13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS (9- 13)	UNGROOMED COAT
	WS (11)	CHROMORHINORRHEA
	WS (11- 13)	URINE-STAINED ABDOMINAL FUR
	WS (13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3878	WS (1- 4)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS (5)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS (5)	CHROMORHINORRHEA
	WS (6- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS (13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS (13)	CHROMORHINORRHEA
3879	WS (1- 4)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS (5- 6)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS (5- 6)	CHROMORHINORRHEA
	WS (7- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3880	WS (1- 8)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS (9- 13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS (9- 13)	LOCALIZED ALOPECIA: LIMB(S)
3881	WS (1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3882	WS (1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3883	WS (1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3884	WS (1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3885	WS (1- 13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL

WS = WEEK OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 45 (PAGE 1): BODY WEIGHTS - INDIVIDUAL DATA - MALE RATS - MAIN STUDY

RAT #	DOSAGE GROUP I														0 (CARRIER CONTROL) PPM																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	DAY	1	2	3	4	5	6	7	8	15	22	29	36	43																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAY = DAY OF STUDY

a. Fasted body weight.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 45 (PAGE 2): BODY WEIGHTS - INDIVIDUAL DATA - MALE RATS - MAIN STUDY

RAT #	DOSAGE GROUP II													
	100 PPM													
	DAY 1	2	3	4	5	6	7	8	15	22	29	36	43	
3726	129.	140.	148.	158.	171.	180.	186.	199.	256.	312.	356.	393.	431.	
3727	164.	178.	186.	198.	209.	223.	230.	243.	304.	360.	404.	432.	462.	
3728	150.	162.	170.	182.	196.	209.	215.	232.	296.	371.	431.	481.	529.	
3729	155.	166.	175.	181.	194.	206.	211.	227.	288.	343.	400.	435.	473.	
3730	135.	145.	151.	159.	167.	176.	179.	192.	244.	284.	331.	356.	390.	
3731	187.	196.	210.	226.	236.	244.	257.	264.	334.	403.	451.	486.	520.	
3732	158.	166.	173.	182.	192.	198.	211.	214.	276.	335.	373.	424.	457.	
3733	158.	167.	176.	184.	195.	204.	216.	221.	291.	358.	410.	454.	499.	
3734	148.	158.	165.	178.	192.	200.	215.	219.	290.	343.	386.	431.	455.	
3735	180.	189.	199.	213.	226.	236.	252.	258.	338.	411.	468.	524.	563.	
	DAY 50	57	64	71	78	85	91a							
3726	454.	471.	491.	514.	525.	541.	525.							
3727	486.	512.	536.	553.	572.	595.	569.							
3728	562.	595.	626.	652.	669.	685.	671.							
3729	501.	523.	546.	571.	590.	604.	589.							
3730	408.	433.	456.	477.	488.	498.	487.							
3731	539.	561.	580.	601.	618.	629.	612.							
3732	484.	517.	539.	560.	580.	591.	579.							
3733	534.	561.	590.	609.	622.	632.	606.							
3734	482.	515.	532.	555.	557.	574.	564.							
3735	600.	642.	642.	658.	681.	700.	692.							

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAY = DAY OF STUDY

a. Fasted body weight.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 45 (PAGE 3): BODY WEIGHTS - INDIVIDUAL DATA - MALE RATS - MAIN STUDY

RAT #	DOSAGE GROUP III													
	500 PPM													
	DAY 1	2	3	4	5	6	7	8	15	22	29	36	43	
3801	132.	144.	152.	160.	172.	182.	185.	201.	253.	310.	363.	396.	434.	
3802	172.	182.	190.	199.	210.	223.	233.	247.	300.	358.	410.	455.	495.	
3803	152.	164.	175.	185.	196.	209.	218.	237.	309.	388.	456.	504.	557.	
3804	156.	166.	175.	186.	197.	206.	214.	232.	295.	358.	416.	458.	498.	
3805	136.	145.	154.	162.	174.	184.	191.	202.	261.	319.	368.	415.	453.	
12250	138.	143.	151.	158.	167.	174.	188.	191.	247.	309.	345.	379.	410.	
3807	158.	165.	174.	182.	194.	200.	213.	217.	273.	322.	358.	393.	419.	
3808	165.	173.	182.	193.	206.	212.	227.	229.	304.	367.	420.	470.	505.	
3809	148.	156.	162.	171.	181.	188.	201.	202.	253.	312.	343.	380.	407.	
3810	177.	186.	196.	209.	220.	228.	242.	247.	312.	371.	408.	457.	492.	
	DAY 50	57	64	71	78	85	91a							
3801	457.	485.	499.	516.	531.	538.	525.							
3802	514.	545.	569.	583.	602.	616.	590.							
3803	590.	627.	658.	687.	710.	732.	711.							
3804	530.	569.	591.	620.	636.	664.	648.							
3805	483.	522.	546.	570.	591.	616.	602.							
12250	438.	464.	496.	515.	522.	530.	522.							
3807	444.	464.	481.	502.	514.	526.	508.							
3808	538.	568.	584.	604.	620.	634.	615.							
3809	432.	452.	474.	494.	502.	509.	486.							
3810	513.	542.	570.	588.	597.	617.	594.							

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAY = DAY OF STUDY

a. Fasted body weight.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 45 (PAGE 4): BODY WEIGHTS - INDIVIDUAL DATA - MALE RATS - MAIN STUDY

RAT #	DOSAGE GROUP IV													
	5000 PPM													
	DAY 1	2	3	4	5	6	7	8	15	22	29	36	43	
3751	137.	137.	148.	157.	167.	178.	187.	195.	261.	317.	360.	405.	439.	
3752	169.	175.	181.	186.	199.	213.	219.	228.	295.	369.	431.	475.	524.	
3753	150.	157.	164.	174.	184.	196.	202.	210.	270.	323.	361.	385.	424.	
3754	155.	157.	165.	174.	186.	194.	204.	212.	281.	359.	424.	468.	505.	
3755	133.	135.	143.	147.	155.	160.	168.	173.	222.	262.	312.	348.	377.	
3756	185.	185.	196.	210.	222.	235.	245.	255.	327.	402.	452.	502.	541.	
3757	157.	156.	164.	172.	181.	189.	193.	201.	255.	293.	307.	331.	344.	
3758	162.	166.	175.	188.	201.	209.	215.	224.	282.	334.	368.	393.	422.	
3759	150.	152.	159.	170.	177.	186.	193.	202.	248.	312.	359.	399.	421.	
3760	175.	180.	190.	203.	216.	226.	234.	244.	291.	333.	369.	411.	431.	
	DAY 50	57	64	71	78	85	91a							
3751	462.	479.	492.	503.	514.	527.	514.							
3752	545.	574.	598.	628.	650.	673.	658.							
3753	444.	456.	480.	495.	503.	510.	498.							
3754	528.	559.	582.	596.	608.	623.	611.							
3755	397.	422.	450.	465.	484.	494.	485.							
3756	576.	602.	624.	643.	661.	670.	654.							
3757	359.	378.	392.	409.	423.	437.	423.							
3758	445.	475.	494.	521.	540.	549.	545.							
3759	445.	470.	495.	515.	533.	524.	512.							
3760	457.	491.	515.	532.	547.	564.	543.							

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAY = DAY OF STUDY

a. Fasted body weight.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 45 (PAGE 5): BODY WEIGHTS - INDIVIDUAL DATA - MALE RATS - MAIN STUDY

RAT #	DOSAGE GROUP V													
	10000 PPM													
	DAY 1	2	3	4	5	6	7	8	15	22	29	36	43	
3701	132.	132.	137.	144.	154.	164.	168.	176.	239.	296.	340.	374.	408.	
18077	175.	173.	173.	181.	195.	204.	210.	220.	298.	375.	434.	481.	520.	
3703	154.	148.	146.	152.	164.	168.	176.	180.	249.	304.	353.	384.	418.	
3704	157.	154.	155.	160.	170.	180.	188.	194.	262.	314.	351.	392.	422.	
3705	137.	137.	133.	139.	148.	158.	161.	168.	220.	265.	306.	343.	376.	
3706	174.	168.	172.	177.	187.	197.	203.	213.	290.	354.	405.	452.	492.	
3707	163.	159.	166.	176.	188.	192.	201.	212.	289.	361.	404.	452.	489.	
3708	166.	159.	165.	170.	177.	173.	175.	187.	260.	328.	366.	406.	432.	
3709	146.	136.	137.	144.	154.	158.	163.	172.	220.	266.	298.	324.	343.	
3710	179.	168.	176.	188.	200.	213.	222.	233.	309.	385.	447.	496.	534.	
	DAY 50	57	64	71	78	85	91a							
3701	427.	452.	474.	490.	499.	509.	500.							
18077	557.	579.	590.	612.	628.	644.	619.							
3703	441.	464.	478.	498.	517.	528.	514.							
3704	450.	468.	496.	514.	535.	552.	532.							
3705	397.	422.	444.	462.	478.	492.	484.							
3706	523.	555.	580.	598.	619.	633.	613.							
3707	525.	542.	572.	593.	615.	626.	612.							
3708	463.	489.	505.	522.	538.	548.	524.							
3709	364.	386.	406.	423.	436.	449.	437.							
3710	563.	602.	636.	661.	683.	694.	688.							

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAY = DAY OF STUDY

a. Fasted body weight.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 46 (PAGE 1): BODY WEIGHTS - INDIVIDUAL DATA - FEMALE RATS - MAIN STUDY

RAT #	DOSAGE GROUP I													
	0 (CARRIER CONTROL) PPM													
	DAY 1	2	3	4	5	6	7	8	15	22	29	36	43	
3901	136.	142.	153.	160.	162.	168.	177.	184.	220.	254.	270.	305.	309.	
3902	175.	180.	183.	182.	192.	198.	200.	202.	235.	251.	288.	311.	337.	
3903	147.	152.	158.	159.	163.	168.	171.	174.	204.	231.	239.	258.	263.	
3904	147.	150.	151.	157.	162.	164.	164.	171.	194.	218.	235.	249.	263.	
3905	131.	137.	138.	146.	149.	153.	153.	158.	184.	204.	220.	217.	237.	
3906	179.	189.	195.	198.	209.	213.	213.	222.	260.	300.	336.	360.	383.	
3907	158.	166.	174.	176.	182.	184.	194.	196.	228.	260.	278.	299.	318.	
3908	146.	152.	151.	150.	159.	163.	166.	169.	190.	209.	224.	237.	251.	
3909	144.	154.	159.	162.	168.	175.	175.	181.	212.	244.	268.	285.	300.	
3910	173.	182.	182.	188.	194.	197.	195.	204.	238.	274.	298.	320.	335.	
	DAY 50	57	64	71	78	85	91a							
3901	329.	341.	343.	354.	354.	358.	353.							
3902	361.	368.	371.	385.	399.	404.	393.							
3903	274.	280.	283.	290.	293.	295.	285.							
3904	282.	297.	297.	307.	324.	331.	327.							
3905	250.	262.	264.	266.	279.	281.	272.							
3906	403.	419.	437.	449.	462.	467.	460.							
3907	332.	340.	359.	366.	379.	381.	378.							
3908	261.	270.	279.	282.	286.	290.	283.							
3909	321.	338.	355.	360.	371.	383.	370.							
3910	357.	368.	386.	384.	393.	407.	394.							

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAY = DAY OF STUDY

a. Fasted body weight.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 46 (PAGE 2): BODY WEIGHTS - INDIVIDUAL DATA - FEMALE RATS - MAIN STUDY

RAT #	DOSAGE GROUP II												
	100 PPM												
	DAY 1	2	3	4	5	6	7	8	15	22	29	36	43
3851	133.	142.	151.	160.	163.	166.	174.	179.	213.	241.	257.	282.	294.
3852	166.	172.	180.	190.	190.	194.	202.	206.	248.	252.	298.	324.	336.
3853	152.	156.	160.	169.	171.	174.	173.	178.	197.	237.	231.	242.	250.
3854	142.	148.	155.	157.	158.	163.	168.	171.	201.	273.	235.	253.	267.
3855	140.	148.	156.	165.	170.	174.	181.	188.	225.	220.	289.	305.	342.
3856	168.	175.	180.	180.	186.	191.	194.	195.	223.	246.	260.	271.	290.
3857	149.	153.	156.	159.	162.	168.	168.	173.	193.	215.	235.	251.	261.
3858	154.	154.	164.	166.	173.	171.	175.	180.	209.	233.	254.	270.	284.
3859	136.	142.	148.	150.	149.	156.	160.	163.	186.	205.	208.	222.	238.
3860	164.	166.	173.	176.	181.	184.	192.	199.	225.	246.	276.	297.	310.
	DAY 50	57	64	71	78	85	91a						
3851	296.	310.	315.	318.	324.	328.	316.						
3852	354.	360.	365.	376.	381.	368.	358.						
3853	265.	276.	279.	283.	291.	301.	291.						
3854	278.	282.	293.	304.	309.	309.	308.						
3855	358.	381.	392.	397.	401.	405.	391.						
3856	302.	311.	320.	330.	342.	337.	328.						
3857	271.	282.	288.	291.	297.	309.	294.						
3858	292.	303.	309.	305.	320.	322.	313.						
3859	247.	255.	263.	272.	277.	276.	272.						
3860	318.	329.	345.	350.	356.	365.	355.						

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAY = DAY OF STUDY

a. Fasted body weight.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 46 (PAGE 3): BODY WEIGHTS - INDIVIDUAL DATA - FEMALE RATS - MAIN STUDY

RAT #	DOSAGE GROUP III												
	500 PPM												
	DAY 1	2	3	4	5	6	7	8	15	22	29	36	43
3926	126.	134.	144.	150.	152.	156.	161.	164.	192.	211.	223.	237.	253.
3927	170.	175.	187.	193.	192.	195.	200.	198.	235.	260.	287.	299.	311.
3928	146.	152.	159.	165.	165.	170.	176.	179.	212.	226.	235.	253.	265.
3929	143.	148.	153.	156.	158.	163.	167.	169.	192.	211.	222.	231.	244.
3930	134.	143.	151.	154.	160.	166.	172.	174.	206.	234.	244.	248.	271.
3931	171.	179.	189.	189.	195.	200.	206.	207.	242.	271.	287.	303.	323.
3932	151.	160.	160.	164.	170.	175.	173.	180.	212.	243.	267.	288.	298.
3933	144.	152.	156.	156.	162.	167.	168.	171.	200.	225.	240.	242.	272.
3934	139.	146.	153.	154.	157.	164.	168.	168.	199.	224.	236.	250.	264.
3935	173.	176.	186.	190.	199.	197.	206.	210.	246.	263.	282.	307.	322.
	DAY 50	57	64	71	78	85	91a						
3926	266.	279.	281.	290.	296.	300.	288.						
3927	331.	344.	352.	363.	374.	373.	362.						
3928	277.	284.	287.	293.	299.	301.	292.						
3929	257.	264.	261.	267.	278.	276.	268.						
3930	291.	305.	314.	323.	331.	334.	327.						
3931	337.	344.	352.	361.	369.	372.	360.						
3932	315.	323.	331.	339.	345.	354.	343.						
3933	288.	299.	305.	312.	321.	330.	316.						
3934	271.	279.	283.	289.	299.	297.	299.						
3935	330.	349.	362.	376.	384.	399.	393.						

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAY = DAY OF STUDY

a. Fasted body weight.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 46 (PAGE 4): BODY WEIGHTS - INDIVIDUAL DATA - FEMALE RATS - MAIN STUDY

RAT #	DOSAGE GROUP IV 5000 PPM												
	DAY 1	2	3	4	5	6	7	8	15	22	29	36	43
3951	131.	137.	144.	155.	162.	170.	174.	185.	213.	234.	261.	277.	288.
3952	166.	170.	179.	185.	189.	192.	198.	206.	234.	251.	277.	293.	300.
3953	148.	153.	162.	167.	169.	172.	181.	182.	218.	235.	249.	260.	277.
3954	157.	164.	170.	177.	179.	189.	197.	201.	247.	257.	310.	325.	359.
3955	130.	132.	138.	144.	151.	153.	158.	163.	192.	210.	229.	245.	258.
3956	172.	170.	173.	185.	190.	196.	196.	198.	237.	258.	289.	307.	328.
3957	158.	156.	167.	173.	182.	188.	194.	199.	226.	256.	274.	293.	316.
3958	157.	163.	174.	178.	179.	189.	193.	201.	223.	249.	261.	277.	289.
3959	140.	145.	154.	154.	162.	166.	170.	174.	202.	223.	239.	248.	274.
3960	166.	169.	172.	175.	176.	176.	184.	187.	208.	229.	251.	271.	286.
	DAY 50	57	64	71	78	85	91a						
3951	299.	315.	305.	292.	318.	325.	313.						
3952	317.	329.	334.	347.	348.	358.	344.						
3953	290.	298.	299.	306.	318.	325.	315.						
3954	375.	408.	423.	449.	464.	478.	467.						
3955	270.	281.	287.	292.	299.	305.	294.						
3956	345.	349.	368.	365.	381.	393.	386.						
3957	331.	335.	357.	387.	404.	398.	397.						
3958	301.	308.	319.	322.	329.	331.	326.						
3959	290.	298.	314.	324.	330.	330.	330.						
3960	291.	304.	320.	326.	329.	340.	326.						

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAY = DAY OF STUDY

a. Fasted body weight.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 46 (PAGE 5): BODY WEIGHTS - INDIVIDUAL DATA - FEMALE RATS - MAIN STUDY

RAT #	DOSAGE GROUP V												
	10000 PPM												
	DAY 1	2	3	4	5	6	7	8	15	22	29	36	43
3876	133.	124.	128.	134.	140.	144.	149.	155.	183.	201.	216.	228.	247.
3877	167.	159.	168.	176.	177.	182.	191.	193.	218.	240.	267.	284.	291.
3878	147.	142.	148.	149.	154.	159.	160.	169.	191.	218.	238.	251.	258.
3879	148.	146.	150.	154.	158.	164.	169.	169.	204.	222.	235.	254.	260.
3880	130.	126.	134.	135.	140.	144.	147.	149.	176.	194.	207.	218.	225.
3881	165.	160.	166.	174.	177.	173.	180.	185.	208.	226.	240.	262.	278.
3882	143.	141.	144.	147.	147.	151.	156.	158.	176.	189.	206.	220.	226.
3883	162.	160.	166.	172.	176.	184.	190.	196.	234.	257.	278.	302.	319.
3884	139.	134.	143.	146.	148.	152.	156.	160.	181.	198.	217.	226.	234.
3885	169.	166.	173.	178.	183.	186.	192.	197.	231.	251.	265.	284.	296.
	DAY 50	57	64	71	78	85	91a						
3876	250.	256.	267.	265.	272.	274.	265.						
3877	300.	317.	328.	342.	347.	362.	350.						
3878	266.	277.	282.	279.	288.	288.	285.						
3879	273.	281.	287.	292.	300.	305.	295.						
3880	234.	250.	256.	259.	266.	277.	267.						
3881	279.	289.	292.	297.	301.	306.	304.						
3882	231.	236.	241.	243.	244.	251.	237.						
3883	330.	335.	353.	361.	367.	372.	369.						
3884	251.	259.	264.	270.	273.	277.	270.						
3885	305.	312.	315.	320.	327.	329.	318.						

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAY = DAY OF STUDY

a. Fasted body weight.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 47 (PAGE 1): FEED CONSUMPTION VALUES - INDIVIDUAL DATA - MALE RATS - MAIN STUDY

RAT #	DOSAGE GROUP I			0 (CARRIER CONTROL) PPM										
	DAYS	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7	7 - 8	8 - 15	15 - 22	22 - 29	29 - 36	36 - 43	43 - 50
3776		19.	20.	21.	20.	21.	22.	20.	154.	155.	175.	174.	176.	173.
3777		25.	25.	27.	26.	26.	30.	26.	207.	219.	233.	243.	247.	231.
3778		18.	21.	21.	22.	22.	23.	21.	166.	170.	184.	183.	191.	177.
3779		18.	21.	21.	21.	23.	22.	22.	162.	166.	173.	173.	168.	154.
3780		18.	21.	21.	19.	23.	23.	19.	175.	183.	199.	186.	191.	185.
3781		25.	26.	24.	24.	26.	25.	26.	185.	200.	206.	201.	206.	196.
3782		21.	21.	22.	21.	23.	21.	23.	172.	172.	200.	188.	192.	189.
3783		23.	22.	22.	23.	23.	24.	23.	170.	176.	192.	181.	189.	179.
3784		18.	20.	21.	22.	27.	24.	27.	190.	207.	224.	214.	214.	211.
3785		23.	23.	22.	24.	25.	23.	25.	177.	188.	199.	202.	203.	204.
RAT #	DOSAGE GROUP I			0 (CARRIER CONTROL) PPM										
	DAYS	50 - 57	57 - 64	64 - 71	71 - 78	78 - 85	85 - 90							
3776		173.	189.	188.	181.	184.	124.							
3777		229.	234.	229.	236.	228.	165.							
3778		181.	190.	179.	171.	172.	118.							
3779		155.	152.	154.	149.	155.	106.							
3780		180.	183.	183.	168.	175.	116.							
3781		192.	200.	199.	190.	186.	114.							
3782		178.	177.	181.	200.	173.	113.							
3783		182.	180.	175.	176.	177.	114.							
3784		205.	210.	210.	192.	196.	170.							
3785		198.	203.	204.	191.	200.	116.							

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAYS = DAYS OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 47 (PAGE 2): FEED CONSUMPTION VALUES - INDIVIDUAL DATA - MALE RATS - MAIN STUDY

RAT #	DOSAGE GROUP II										100 PPM									
	DAYS	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7	7 - 8	8 - 15	15 - 22	22 - 29	29 - 36	36 - 43	43 - 50						
3726		19.	18.	21.	21.	20.	22.	21.	152.	150.	164.	166.	177.	164.						
3727		23.	25.	24.	24.	23.	25.	22.	174.	175.	182.	195.	201.	177.						
3728		23.	22.	24.	23.	25.	26.	24.	186.	197.	205.	208.	216.	215.						
3729		23.	22.	22.	22.	26.	24.	24.	179.	173.	183.	178.	180.	177.						
3730		17.	19.	20.	18.	20.	20.	19.	152.	164.	179.	169.	176.	168.						
3731		25.	26.	26.	26.	25.	24.	27.	178.	186.	210.	208.	184.	182.						
3732		20.	21.	19.	20.	22.	20.	20.	155.	166.	175.	178.	177.	175.						
3733		22.	21.	20.	22.	23.	21.	23.	167.	184.	196.	188.	202.	191.						
3734		21.	20.	20.	25.	25.	23.	24.	177.	170.	184.	175.	182.	174.						
3735		26.	26.	25.	27.	27.	27.	28.	206.	212.	229.	220.	222.	222.						
	DAYS	50 - 57	57 - 64	64 - 71	71 - 78	78 - 85	85 - 90													
3726		162.	163.	167.	158.	161.	110.													
3727		180.	183.	175.	192.	178.	115.													
3728		211.	213.	214.	208.	210.	153.													
3729		171.	174.	176.	174.	171.	118.													
3730		169.	164.	168.	161.	162.	113.													
3731		175.	174.	183.	245.	164.	122.													
3732		173.	180.	188.	178.	182.	129.													
3733		185.	195.	190.	176.	179.	99.													
3734		170.	165.	172.	151.	169.	125.													
3735		210.	179.	192.	195.	197.	138.													

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAYS = DAYS OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 47 (PAGE 3): FEED CONSUMPTION VALUES - INDIVIDUAL DATA - MALE RATS - MAIN STUDY

RAT #	DOSAGE GROUP III														
	500 PPM														
DAYS	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7	7 - 8	8 - 15	15 - 22	22 - 29	29 - 36	36 - 43	43 - 50		
3801	19.	19.	20.	21.	20.	20.	21.	149.	156.	170.	159.	164.	167.		
3802	21.	22.	23.	21.	24.	26.	22.	164.	164.	175.	182.	185.	173.		
3803	22.	23.	24.	23.	24.	26.	26.	187.	221.	211.	205.	217.	206.		
3804	22.	25.	25.	23.	23.	25.	23.	186.	187.	203.	203.	200.	195.		
3805	19.	21.	21.	21.	22.	24.	19.	168.	168.	177.	186.	186.	186.		
12250	19.	20.	19.	19.	21.	19.	20.	152.	159.	170.	156.	160.	154.		
3807	21.	21.	21.	22.	23.	20.	22.	150.	151.	158.	152.	158.	151.		
3808	23.	22.	23.	24.	24.	22.	23.	172.	174.	197.	180.	190.	188.		
3809	20.	19.	18.	21.	21.	20.	20.	148.	154.	162.	152.	157.	155.		
3810	24.	24.	24.	25.	25.	24.	26.	179.	182.	188.	186.	197.	182.		
DAYS	50 - 57	57 - 64	64 - 71	71 - 78	78 - 85	85 - 90									
3801	167.	154.	160.	157.	142.	111.									
3802	173.	170.	171.	175.	166.	118.									
3803	199.	207.	205.	198.	194.	135.									
3804	200.	195.	196.	183.	193.	133.									
3805	189.	190.	190.	187.	193.	147.									
12250	155.	168.	165.	156.	156.	112.									
3807	149.	152.	158.	151.	153.	96.									
3808	180.	180.	182.	181.	179.	123.									
3809	155.	162.	159.	144.	147.	90.									
3810	186.	197.	191.	175.	194.	137.									

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAYS = DAYS OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 47 (PAGE 4): FEED CONSUMPTION VALUES - INDIVIDUAL DATA - MALE RATS - MAIN STUDY

RAT #	DOSAGE GROUP IV								5000 PPM							
	DAYS	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7	7 - 8	8 - 15	15 - 22	22 - 29	29 - 36	36 - 43	43 - 50		
3751		12.	18.	21.	20.	21.	25.	23.	169.	162.	163.	166.	171.	162.		
3752		18.	21.	21.	24.	24.	26.	24.	173.	194.	206.	196.	200.	186.		
3753		17.	21.	23.	22.	22.	24.	23.	165.	163.	169.	158.	171.	159.		
3754		13.	20.	23.	23.	20.	28.	25.	175.	194.	207.	195.	185.	186.		
3755		13.	17.	19.	15.	18.	19.	19.	140.	143.	157.	153.	150.	149.		
3756		18.	23.	25.	26.	28.	27.	24.	194.	195.	204.	191.	192.	191.		
3757		15.	20.	19.	21.	22.	20.	19.	148.	131.	137.	130.	128.	125.		
3758		20.	24.	24.	26.	26.	22.	20.	173.	178.	175.	169.	166.	167.		
3759		17.	21.	21.	21.	22.	23.	22.	151.	169.	176.	163.	160.	159.		
3760		23.	26.	25.	28.	30.	27.	29.	202.	192.	202.	200.	187.	184.		
	DAYS	50 - 57	57 - 64	64 - 71	71 - 78	78 - 85	85 - 90									
3751		152.	151.	152.	145.	145.	96.									
3752		186.	191.	200.	188.	189.	126.									
3753		154.	160.	150.	154.	151.	110.									
3754		179.	177.	171.	166.	175.	125.									
3755		149.	158.	152.	149.	149.	110.									
3756		186.	183.	189.	183.	179.	125.									
3757		116.	126.	129.	131.	129.	91.									
3758		170.	180.	173.	166.	156.	115.									
3759		157.	165.	162.	168.	143.	106.									
3760		186.	184.	182.	181.	182.	123.									

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAYS = DAYS OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 47 (PAGE 5): FEED CONSUMPTION VALUES - INDIVIDUAL DATA - MALE RATS - MAIN STUDY

RAT #	DOSAGE GROUP V														10000 PPM													
	DAYS	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7	7 - 8	8 - 15	15 - 22	22 - 29	29 - 36	36 - 43	43 - 50														
3701		12.	15.	19.	18.	22.	83.a	23.	180.	170.	176.	161.	169.	150.														
18077		14.	17.	20.	21.	23.	23.	26.	193.	207.	211.	205.	206.	205.														
3703		7.	14.	16.	16.	16.	20.	19.	160.	168.	171.	160.	165.	163.														
3704		10.	14.	19.	19.	22.	23.	20.	167.	172.	166.	172.	177.	182.														
3705		10.	10.	15.	17.	20.	20.	19.	144.	141.	157.	156.	159.	155.														
3706		10.	15.	16.	19.	22.	23.	20.	179.	178.	197.	185.	196.	191.														
3707	b		17.	19.	22.	21.	28.	22.	357.a	199.	202.	198.	193.	196.														
3708		12.	17.	15.	17.	12.	15.	20.	166.	178.	174.	165.	166.	163.														
3709		7.	11.	15.	17.	18.	18.	20.	139.	143.	158.	141.	140.	140.														
3710		8.	18.	22.	25.	31.	26.	28.	205.	211.	219.	210.	214.	211.														
DAYS 50 - 57 57 - 64 64 - 71 71 - 78 78 - 85 85 - 90																												
3701		152.	155.	157.	148.	146.	109.																					
18077		187.	188.	188.	180.	183.	115.																					
3703		160.	152.	160.	157.	163.	109.																					
3704		173.	180.	176.	181.	177.	111.																					
3705		154.	157.	159.	148.	154.	111.																					
3706		196.	195.	196.	191.	192.	126.																					
3707		183.	193.	191.	189.	175.	131.																					
3708		159.	157.	156.	157.	156.	103.																					
3709		142.	153.	143.	148.	153.	102.																					
3710		209.	211.	208.	208.	208.	157.																					

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAYS = DAYS OF STUDY

a. Value appeared incorrectly recorded and was excluded from summarization and statistical analyses.

b. Spilled feed precluded the calculation of this value.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 48 (PAGE 1): FEED CONSUMPTION VALUES - INDIVIDUAL DATA - FEMALE RATS - MAIN STUDY

RAT #	DOSAGE GROUP I			0 (CARRIER CONTROL) PPM										
DAYS	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7	7 - 8	8 - 15	15 - 22	22 - 29	29 - 36	36 - 43	43 - 50	
3901	19.	18.	18.	16.	18.	17.	19.	124.	129.	129.	143.	129.	125.	
3902	20.	17.	15.	19.	20.	15.	16.	126.	127.	142.	151.	162.	155.	
3903	17.	17.	15.	16.	18.	15.	15.	112.	118.	111.	115.	114.	110.	
3904	15.	13.	16.	17.	16.	11.	16.	105.	116.	111.	110.	120.	132.	
3905	16.	12.	16.	16.	15.	12.	15.	106.	107.	116.	102.	111.	109.	
3906	21.	19.	22.	22.	17.	17.	21.	136.	161.	168.	163.	163.	161.	
3907	16.	18.	20.	18.	17.	19.	17.	104.	135.	134.	127.	125.	125.	
3908	17.	14.	13.	17.	14.	16.	14.	107.	115.	112.	119.	118.	118.	
3909	20.	19.	18.	19.	17.	16.	17.	92.	133.	141.	140.	147.	141.	
3910	22.	17.	22.	22.	16.	16.	19.	41.	154.	194.	157.	158.	165.	
DAYS	50 - 57	57 - 64	64 - 71	71 - 78	78 - 85	85 - 90								
3901	123.	103.	108.	107.	102.	76.								
3902	132.	118.	128.	128.	119.	88.								
3903	110.	101.	105.	105.	103.	70.								
3904	117.	112.	117.	135.	123.	85.								
3905	103.	104.	102.	111.	104.	69.								
3906	145.	138.	142.	143.	118.	96.								
3907	122.	123.	118.	112.	111.	85.								
3908	108.	103.	108.	96.	106.	76.								
3909	141.	134.	139.	134.	131.	92.								
3910	136.	141.	140.	134.	136.	97.								

ALL WEIGHTS WERE RECORDED IN GRAMS (G).

DAYS = DAYS OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 48 (PAGE 2): FEED CONSUMPTION VALUES - INDIVIDUAL DATA - FEMALE RATS - MAIN STUDY

RAT #	DOSAGE GROUP II														100 PPM													
	DAYS	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7	7 - 8	8 - 15	15 - 22	22 - 29	29 - 36	36 - 43	43 - 50														
3851		19.	18.	18.	18.	17.	16.	17.	123.	160.	88.	133.	129.	114.														
3852		20.	19.	21.	18.	20.	19.	20.	152.	103.	122.	157.	152.	148.														
3853		18.	16.	17.	17.	17.	12.	16.	107.	133.	63.	107.	105.	110.														
3854		18.	16.	15.	13.	19.	14.	16.	113.	80.	70.	124.	128.	121.														
3855		22.	19.	22.	22.	21.	21.	23.	160.	174.	249.	236.	238.	216.														
3856		18.	18.	16.	18.	16.	17.	14.	182.	117.	122.	117.	127.	119.														
3857		16.	14.	16.	16.	15.	14.	15.	78.	114.	119.	122.	121.	117.														
3858		16.	18.	20.	17.	13.	15.	15.	130.	133.	134.	133.	134.	130.														
3859		17.	16.	16.	13.	16.	16.	14.	74.	111.	107.	112.	a	111.														
3860		19.	18.	18.	18.	16.	20.	19.	71.	141.	151.	150.	150.	136.														
DAYS 50 - 57 57 - 64 64 - 71 71 - 78 78 - 85 85 - 90																												
3851		112.	106.	104.	104.	102.	69.																					
3852		135.	123.	125.	125.	117.	66.																					
3853		98.	98.	103.	103.	102.	68.																					
3854		114.	121.	123.	115.	118.	86.																					
3855		188.	177.	160.	160.	152.	96.																					
3856		114.	116.	122.	119.	108.	69.																					
3857		108.	113.	107.	110.	107.	78.																					
3858		114.	107.	105.	103.	104.	80.																					
3859		114.	116.	108.	108.	107.	77.																					
3860		139.	143.	139.	138.	140.	88.																					

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAYS = DAYS OF STUDY

a. Spilled feed precluded the calculation of this value.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 48 (PAGE 3): FEED CONSUMPTION VALUES - INDIVIDUAL DATA - FEMALE RATS - MAIN STUDY

RAT #	DOSAGE GROUP III												500 PPM					
DAYS	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7	7 - 8	8 - 15	15 - 22	22 - 29	29 - 36	36 - 43	43 - 50					
3926	18.	18.	17.	17.	16.	16.	15.	109.	113.	109.	116.	119.	111.					
3927	18.	20.	20.	16.	16.	16.	15.	124.	129.	142.	131.	138.	143.					
3928	19.	18.	17.	15.	16.	17.	17.	122.	109.	122.	115.	117.	115.					
3929	17.	15.	14.	15.	16.	14.	14.	105.	106.	a	100.	106.	107.					
3930	19.	17.	16.	19.	18.	17.	17.	128.	136.	132.	128.	129.	130.					
3931	19.	20.	17.	19.	16.	18.	17.	111.	129.	127.	130.	139.	126.					
3932	19.	15.	17.	18.	16.	15.	19.	112.	141.	135.	145.	131.	132.					
3933	16.	17.	14.	16.	15.	16.	13.	107.	120.	119.	111.	130.	125.					
3934	17.	16.	15.	16.	15.	16.	13.	82.	119.	117.	120.	116.	110.					
3935	16.	20.	22.	21.	13.	21.	18.	60.	137.	145.	148.	141.	152.					
DAYS	50 - 57	57 - 64	64 - 71	71 - 78	78 - 85	85 - 90												
3926	111.	110.	113.	106.	102.	67.												
3927	132.	122.	132.	120.	121.	75.												
3928	114.	99.	101.	104.	106.	77.												
3929	99.	93.	110.	105.	98.	70.												
3930	128.	126.	121.	118.	117.	82.												
3931	b	115.	122.	111.	109.	82.												
3932	115.	115.	118.	116.	111.	79.												
3933	114.	113.	112.	111.	105.	74.												
3934	104.	106.	105.	104.	96.	86.												
3935	147.	144.	141.	156.	156.	102.												

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAYS = DAYS OF STUDY

a. Spilled feed precluded the calculation of this value.

b. Value was not recorded.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 48 (PAGE 4): FEED CONSUMPTION VALUES - INDIVIDUAL DATA - FEMALE RATS - MAIN STUDY

RAT #	DOSAGE GROUP IV															5000 PPM				
	DAYS	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7	7 - 8	8 - 15	15 - 22	22 - 29	29 - 36	36 - 43	43 - 50						
3951		16.	18.	20.	20.	20.	18.	24.	129.	132.	137.	121.	137.	140.						
3952		17.	19.	21.	17.	18.	17.	19.	121.	128.	137.	126.	129.	127.						
3953		16.	18.	19.	17.	16.	16.	18.	124.	140.	131.	117.	124.	120.						
3954		19.	18.	20.	20.	20.	18.	20.	139.	142.	162.	147.	162.	164.						
3955		14.	15.	17.	17.	15.	14.	17.	116.	136.	77.	114.	121.	117.						
3956		10.	18.	21.	18.	17.	18.	16.	93.	129.	145.	145.	141.	146.						
3957		14.	20.	20.	23.	18.	21.	21.	71.	137.	132.	147.	141.	129.						
3958		17.	22.	20.	17.	20.	21.	21.	99.	130.	125.	123.	120.	115.						
3959		13.	18.	17.	18.	16.	18.	16.	168.	119.	223.	114.	125.	128.						
3960		15.	17.	17.	14.	13.	17.	15.	91.	118.	128.	115.	121.	125.						
	DAYS	50 - 57	57 - 64	64 - 71	71 - 78	78 - 85	85 - 90													
3951		130.	116.	76.	120.	119.	77.													
3952		124.	117.	120.	108.	111.	77.													
3953		115.	106.	106.	112.	114.	76.													
3954		168.	161.	161.	154.	142.	108.													
3955		113.	110.	107.	110.	112.	77.													
3956		123.	130.	119.	126.	135.	98.													
3957		123.	128.	151.	149.	111.	84.													
3958		109.	112.	106.	108.	104.	75.													
3959		121.	127.	116.	112.	110.	83.													
3960		112.	113.	114.	116.	110.	80.													

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAYS = DAYS OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 48 (PAGE 5): FEED CONSUMPTION VALUES - INDIVIDUAL DATA - FEMALE RATS - MAIN STUDY

RAT #	DOSAGE GROUP V														10000 PPM													
	DAYS	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7	7 - 8	8 - 15	15 - 22	22 - 29	29 - 36	36 - 43	43 - 50														
3876		6.	12.	16.	16.	15.	13.	16.	104.	104.	107.	101.	107.	101.														
3877		10.	15.	19.	18.	19.	20.	19.	121.	130.	137.	129.	137.	134.														
3878		8.	15.	12.	16.	16.	14.	18.	111.	123.	126.	119.	109.	111.														
3879		10.	12.	15.	16.	16.	13.	13.	110.	108.	110.	115.	112.	117.														
3880		10.	16.	14.	17.	16.	14.	14.	111.	111.	120.	110.	109.	110.														
3881		9.	15.	18.	17.	8.	17.	16.	37.	106.	108.	111.	113.	107.														
3882		10.	13.	14.	14.	13.	14.	14.	103.	95.	101.	101.	98.	92.														
3883		12.	16.	19.	20.	19.	a	24.	65.	131.	140.	144.	140.	131.														
3884		7.	15.	16.	15.	13.	15.	15.	66.	102.	105.	99.	101.	108.														
3885		10.	16.	19.	16.	14.	18.	16.	92.	125.	122.	124.	120.	117.														
DAYS	50 - 57	57 - 64	64 - 71	71 - 78	78 - 85	85 - 90																						
3876		97.	105.	95.	99.	100.	60.																					
3877		136.	a	140.	127.	128.	89.																					
3878		101.	93.	93.	95.	93.	70.																					
3879		106.	112.	114.	120.	119.	75.																					
3880		120.	117.	118.	123.	126.	87.																					
3881		110.	97.	98.	103.	92.	82.																					
3882		87.	87.	89.	89.	94.	62.																					
3883		126.	131.	122.	123.	121.	87.																					
3884		103.	105.	101.	103.	94.	69.																					
3885		112.	108.	111.	172.	172.	67.																					

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAYS = DAYS OF STUDY

a. Spilled feed precluded the calculation of this value.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 49 (PAGE 1): NECROPSY OBSERVATIONS - INDIVIDUAL DATA - MALE RATS - MAIN STUDY

RAT NUMBER	DAY OF NECROPSY	DAYS OF EXPOSURE	OBSERVATIONS
DOSAGE GROUP I			0 (CARRIER CONTROL) PPM
3776	DS 91	90	ALL TISSUES APPEARED NORMAL.
3777	DS 91	90	ALL TISSUES APPEARED NORMAL.
3778	DS 91	90	LYMPH NODES: SUBMANDIBULAR, DARK RED. LIVER: RIGHT LATERAL LOBE, MISSHAPEN. ALL OTHER TISSUES APPEARED NORMAL.
3779	DS 91	90	THYMUS: NUMEROUS RED AREAS (PINPOINT TO 0.1 CM IN DIAMETER). ALL OTHER TISSUES APPEARED NORMAL.
3780	DS 91	90	ALL TISSUES APPEARED NORMAL.
3781	DS 91	90	ALL TISSUES APPEARED NORMAL.
3782	DS 91	90	ALL TISSUES APPEARED NORMAL.
3783	DS 91	90	ALL TISSUES APPEARED NORMAL.
3784	DS 91	90	SPLEEN: CONSTRICTED AREA (1.6 CM X 0.5 CM). ALL OTHER TISSUES APPEARED NORMAL.
3785	DS 91	90	ALL TISSUES APPEARED NORMAL.
DOSAGE GROUP II			100 PPM
3726	DS 91	90	ALL TISSUES APPEARED NORMAL.
3727	DS 91	90	ALL TISSUES APPEARED NORMAL.
3728	DS 91	90	ALL TISSUES APPEARED NORMAL.
3729	DS 91	90	LYMPH NODES: SUBMANDIBULAR, DARK RED. ALL OTHER TISSUES APPEARED NORMAL.
3730	DS 91	90	ALL TISSUES APPEARED NORMAL.
3731	DS 91	90a	ALL TISSUES APPEARED NORMAL.
3732	DS 91	90	ALL TISSUES APPEARED NORMAL.
3733	DS 91	90	ALL TISSUES APPEARED NORMAL.
3734	DS 91	90	ALL TISSUES APPEARED NORMAL.
3735	DS 91	90	ALL TISSUES APPEARED NORMAL.

DAYS OF EXPOSURE WERE CALCULATED FROM DAY 1 OF STUDY (FIRST FEED VALUE RECORDED) THROUGH THE DAY BEFORE EUTHANASIA

DS = DAY OF STUDY

a. The feed jar provided to rat 3731 on Day 29 of study was incorrectly labeled. This rat is presumed to have been provided the correct feed.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 49 (PAGE 2): NECROPSY OBSERVATIONS - INDIVIDUAL DATA - MALE RATS - MAIN STUDY

RAT NUMBER	DAY OF NECROPSY	DAYS OF EXPOSURE	OBSERVATIONS
DOSAGE GROUP III			500 PPM
3801	DS 91	90	ALL TISSUES APPEARED NORMAL.
3802	DS 91	90	ALL TISSUES APPEARED NORMAL.
3803	DS 91	90	ALL TISSUES APPEARED NORMAL.
3804	DS 91	90	ALL TISSUES APPEARED NORMAL.
3805	DS 91	90	ALL TISSUES APPEARED NORMAL.
12250	DS 91	90	ALL TISSUES APPEARED NORMAL.
3807	DS 91	90	ALL TISSUES APPEARED NORMAL.
3808	DS 91	90	ALL TISSUES APPEARED NORMAL.
3809	DS 91	90	ALL TISSUES APPEARED NORMAL.
3810	DS 91	90	ALL TISSUES APPEARED NORMAL.
DOSAGE GROUP IV			5000 PPM
3751	DS 91	90	ALL TISSUES APPEARED NORMAL.
3752	DS 91	90	ALL TISSUES APPEARED NORMAL.
3753	DS 91	90	ALL TISSUES APPEARED NORMAL.
3754	DS 91	90	ALL TISSUES APPEARED NORMAL.
3755	DS 91	90	LYMPH NODES: SUBMANDIBULAR, DARK RED. ALL OTHER TISSUES APPEARED NORMAL.
3756	DS 91	90	ALL TISSUES APPEARED NORMAL.
3757	DS 91	90	ALL TISSUES APPEARED NORMAL.
3758	DS 91	90	KIDNEYS: RIGHT, PELVIS, SLIGHT DILATION. ALL OTHER TISSUES APPEARED NORMAL.
3759	DS 91	90	ALL TISSUES APPEARED NORMAL.
3760	DS 91	90	ALL TISSUES APPEARED NORMAL.

DAYS OF EXPOSURE WERE CALCULATED FROM DAY 1 OF STUDY (FIRST FEED VALUE RECORDED) THROUGH THE DAY BEFORE EUTHANASIA
DS = DAY OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 49 (PAGE 3): NECROPSY OBSERVATIONS - INDIVIDUAL DATA - MALE RATS - MAIN STUDY

RAT NUMBER	DAY OF NECROPSY	DAYS OF EXPOSURE	OBSERVATIONS
DOSAGE GROUP V			10000 PPM
3701	DS 91	90	ALL TISSUES APPEARED NORMAL.
18077	DS 91	90	ALL TISSUES APPEARED NORMAL.
3703	DS 91	90	ALL TISSUES APPEARED NORMAL.
3704	DS 91	90	ALL TISSUES APPEARED NORMAL.
3705	DS 91	90	ALL TISSUES APPEARED NORMAL.
3706	DS 91	90	KIDNEYS: RIGHT, PELVIS, SLIGHT DILATION. ALL OTHER TISSUES APPEARED NORMAL.
3707	DS 91	90	ALL TISSUES APPEARED NORMAL.
3708	DS 91	90	ALL TISSUES APPEARED NORMAL.
3709	DS 91	90	ALL TISSUES APPEARED NORMAL.
3710	DS 91	90	ALL TISSUES APPEARED NORMAL.

DAYS OF EXPOSURE WERE CALCULATED FROM DAY 1 OF STUDY (FIRST FEED VALUE RECORDED) THROUGH THE DAY BEFORE EUTHANASIA
DS = DAY OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 50 (PAGE 1): NECROPSY OBSERVATIONS - INDIVIDUAL DATA - FEMALE RATS - MAIN STUDY

RAT NUMBER	DAY OF NECROPSY	DAYS OF EXPOSURE	OBSERVATIONS
DOSAGE GROUP I			0 (CARRIER CONTROL) PPM
3901	DS 91	90	ALL TISSUES APPEARED NORMAL.
3902	DS 91	90	ALL TISSUES APPEARED NORMAL.
3903	DS 91	90	ALL TISSUES APPEARED NORMAL.
3904	DS 91	90	ALL TISSUES APPEARED NORMAL.
3905	DS 91	90	ALL TISSUES APPEARED NORMAL.
3906	DS 91	90	ABDOMINAL ADIPOSE: MASS (0.5 CM X 0.5 CM X 0.1 CM); CUT SURFACE REVEALED TAN FIRM MATERIAL. ALL OTHER TISSUES APPEARED NORMAL.
3907	DS 91	90	ALL TISSUES APPEARED NORMAL.
3908	DS 91	90	ALL TISSUES APPEARED NORMAL.
3909	DS 91	90	ALL TISSUES APPEARED NORMAL.
3910	DS 91	90	ALL TISSUES APPEARED NORMAL.
DOSAGE GROUP II			100 PPM
3851	DS 91	90	LYMPH NODES: SUBMANDIBULAR, RED. ALL OTHER TISSUES APPEARED NORMAL.
3852	DS 91	90	ALL TISSUES APPEARED NORMAL.
3853	DS 91	90	ALL TISSUES APPEARED NORMAL.
3854	DS 91	90	ALL TISSUES APPEARED NORMAL.
3855	DS 91	90	ALL TISSUES APPEARED NORMAL.
3856	DS 91	90	ALL TISSUES APPEARED NORMAL.
3857	DS 91	90	ALL TISSUES APPEARED NORMAL.
3858	DS 91	90	ALL TISSUES APPEARED NORMAL.
3859	DS 91	90	ALL TISSUES APPEARED NORMAL.
3860	DS 91	90	ALL TISSUES APPEARED NORMAL.
DOSAGE GROUP III			500 PPM
3926	DS 91	90	ALL TISSUES APPEARED NORMAL.
3927	DS 91	90	ALL TISSUES APPEARED NORMAL.
3928	DS 91	90	ALL TISSUES APPEARED NORMAL.
3929	DS 91	90	ALL TISSUES APPEARED NORMAL.
3930	DS 91	90	ALL TISSUES APPEARED NORMAL.
3931	DS 91	90	ALL TISSUES APPEARED NORMAL.
3932	DS 91	90	ALL TISSUES APPEARED NORMAL.
3933	DS 91	90	ALL TISSUES APPEARED NORMAL.
3934	DS 91	90	ALL TISSUES APPEARED NORMAL.
3935	DS 91	90	ALL TISSUES APPEARED NORMAL.

DAYS OF EXPOSURE WERE CALCULATED FROM DAY 1 OF STUDY (FIRST FEED VALUE RECORDED) THROUGH THE DAY BEFORE EUTHANASIA
DS = DAY OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 50 (PAGE 2): NECROPSY OBSERVATIONS - INDIVIDUAL DATA - FEMALE RATS - MAIN STUDY

RAT NUMBER	DAY OF NECROPSY	DAYS OF EXPOSURE	OBSERVATIONS
DOSAGE GROUP IV			5000 PPM
3951	DS 91	90a	ALL TISSUES APPEARED NORMAL.
3952	DS 91	90	ALL TISSUES APPEARED NORMAL.
3953	DS 91	90	ALL TISSUES APPEARED NORMAL.
3954	DS 91	90	ALL TISSUES APPEARED NORMAL.
3955	DS 91	90	ALL TISSUES APPEARED NORMAL.
3956	DS 91	90	ALL TISSUES APPEARED NORMAL.
3957	DS 91	90	ALL TISSUES APPEARED NORMAL.
3958	DS 91	90	ALL TISSUES APPEARED NORMAL.
3959	DS 91	90	ALL TISSUES APPEARED NORMAL.
3960	DS 91	90	ALL TISSUES APPEARED NORMAL.
DOSAGE GROUP V			10000 PPM
3876	DS 91	90	ALL TISSUES APPEARED NORMAL.
3877	DS 91	90	ALL TISSUES APPEARED NORMAL.
3878	DS 91	90	ALL TISSUES APPEARED NORMAL.
3879	DS 91	90	ALL TISSUES APPEARED NORMAL.
3880	DS 91	90	ALL TISSUES APPEARED NORMAL.
3881	DS 91	90	ALL TISSUES APPEARED NORMAL.
3882	DS 91	90	ALL TISSUES APPEARED NORMAL.
3883	DS 91	90	ALL TISSUES APPEARED NORMAL.
3884	DS 91	90	ALL TISSUES APPEARED NORMAL.
3885	DS 91	90	ALL TISSUES APPEARED NORMAL.

DAYS OF EXPOSURE WERE CALCULATED FROM DAY 1 OF STUDY (FIRST FEED VALUE RECORDED) THROUGH THE DAY BEFORE EUTHANASIA

DS = DAY OF STUDY

- a. The feed jar provided to rat 3951 on Day 29 of study was incorrectly labeled. This rat is presumed to have been provided the correct feed.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 51 (PAGE 1): CLINICAL OBSERVATIONS - INDIVIDUAL DATA - MALE RATS - CHOLINESTERASE SUBSET

RAT #		DESCRIPTION
DOSAGE GROUP I		0 (CARRIER CONTROL) PPM
3786	DS (17- 77)	SPARSE HAIR COAT: LIMB(S)
	DS (29- 77)	SPARSE HAIR COAT: UNDERSIDE
	DS (30- 32)	CHROMODACRYORRHEA
	DS (91)	SPARSE HAIR COAT: UNDERSIDE a
3787	DS (36)	CHROMORHINORRHEA
	DS (38- 50)	INCISOR(S): MISSING/BROKEN
	DS (51- 56)	INCISOR(S): MISALIGNED
	DS (59- 63)	INCISOR(S): MISSING/BROKEN
	DS (73- 77)	INCISOR(S): MISSING/BROKEN
3788		NO ADVERSE FINDINGS
3789	DS (70- 91)	CHROMODACRYORRHEA a
	DS (73)	LACRIMATION
3790	DS (43- 91)	TAIL: BENT a
3791	DS (26- 91)	TAIL: BENT a
3792	DS (73- 75)	SOFT OR LIQUID FECES
3793		NO ADVERSE FINDINGS
3794	DS (40- 42)	SPARSE HAIR COAT: LIMB(S)
3795	DS (17- 39)	SPARSE HAIR COAT: LIMB(S)
3796		NO ADVERSE FINDINGS
3797	DS (60- 61)	CHROMODACRYORRHEA
3798		NO ADVERSE FINDINGS
3799		NO ADVERSE FINDINGS
3800		NO ADVERSE FINDINGS

CLINICAL OBSERVATIONS APPEARED NORMAL UNLESS NOTED OTHERWISE

DS = DAY OF STUDY

a. Observation confirmed at necropsy.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 51 (PAGE 2): CLINICAL OBSERVATIONS - INDIVIDUAL DATA - MALE RATS - CHOLINESTERASE SUBSET

RAT #		DESCRIPTION
DOSAGE GROUP II		100 PPM
3736	DS(42- 47)	INCISOR(S): MISALIGNED
3737		NO ADVERSE FINDINGS
3738		NO ADVERSE FINDINGS
3739		NO ADVERSE FINDINGS
3740		NO ADVERSE FINDINGS
3741		NO ADVERSE FINDINGS
3742	DS(1- 8)	HEAD: SCAB (0.4 CM X 0.4 CM)
	DS(11- 14)	NECK: SCAB (0.2 CM X 0.2 CM)
	DS(50)	SOFT OR LIQUID FECES
3743		NO ADVERSE FINDINGS
3744	DS(10- 14)	NECK: SCAB (0.2 CM X 0.2 CM)
3745	DS(40- 91)	LOCALIZED ALOPECIA: LIMB(S) a
3746		NO ADVERSE FINDINGS
3747	DS(77)	FOUND DEAD
3748		NO ADVERSE FINDINGS
3749		NO ADVERSE FINDINGS
3750	DS(73- 75)	CHROMORHINORRHEA

CLINICAL OBSERVATIONS APPEARED NORMAL UNLESS NOTED OTHERWISE

DS = DAY OF STUDY

a. Observation confirmed at necropsy.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 51 (PAGE 3): CLINICAL OBSERVATIONS - INDIVIDUAL DATA - MALE RATS - CHOLINESTERASE SUBSET

RAT #	DESCRIPTION
DOSAGE GROUP III	500 PPM
3811	NO ADVERSE FINDINGS
3812	NO ADVERSE FINDINGS
3813 DS(4)	CHROMORHINORRHEA
DS(43- 91)	TAIL: BENT
3814 DS(17- 23)	SPARSE HAIR COAT: LIMB(S)
DS(24- 70)	LOCALIZED ALOPECIA: LIMB(S)
3815 DS(22- 25)	SPARSE HAIR COAT: LIMB(S)
DS(26- 91)	TAIL: BENT a
DS(29- 38)	SPARSE HAIR COAT: LIMB(S)
DS(40- 91)	SPARSE HAIR COAT: LIMB(S) a
3816 DS(10- 13)	CHROMODACRYORRHEA
DS(22- 25)	CHROMODACRYORRHEA
3817 DS(6- 13)	RIGHT EAR AND HEAD: SCAB (1.0 CM X 0.4 CM)
DS(14- 35)	HEAD: SCAB (DID NOT EXCEED 0.6 CM X 0.2 CM)
3818 DS(8)	CHROMORHINORRHEA
DS(10- 13)	CHROMORHINORRHEA
3819 DS(86)	VOCALIZATION TO TOUCH
DS(86)	CHROMORHINORRHEA a
DS(86)	CHROMODACRYORRHEA a
DS(86)	INCISOR(S): MISSING/BROKEN a
DS(86)	RED PERIORAL SUBSTANCE a
DS(86)	DYSPNEA
DS(86)	PALATE: BROKEN a
DS(86)	UNSCHEDULED EUTHANASIA DUE TO ADVERSE CLINICAL OBSERVATIONS
3820 DS(40- 56)	SPARSE HAIR COAT: LIMB(S)
3821 DS(33- 47)	SPARSE HAIR COAT: LIMB(S)
DS(91)	SPARSE HAIR COAT: LIMB(S) a
3822 DS(91)	RIGHT EAR: SWOLLEN a
3823 DS(73- 75)	CHROMORHINORRHEA
3824 DS(70)	CHROMODACRYORRHEA
3825	NO ADVERSE FINDINGS

CLINICAL OBSERVATIONS APPEARED NORMAL UNLESS NOTED OTHERWISE

DS = DAY OF STUDY

a. Observation confirmed at necropsy.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 51 (PAGE 4): CLINICAL OBSERVATIONS - INDIVIDUAL DATA - MALE RATS - CHOLINESTERASE SUBSET

RAT #		DESCRIPTION
DOSAGE GROUP IV		5000 PPM
3761	DS(4)	CHROMORHINORRHEA
3762	DS(73- 75)	CHROMORHINORRHEA
3763		NO ADVERSE FINDINGS
3764		NO ADVERSE FINDINGS
3765		NO ADVERSE FINDINGS
3766a		NO ADVERSE FINDINGS
3767a	DS(17- 25)	INCISOR(S): MISSING/BROKEN
	DS(29- 30)	HEAD, BETWEEN THE EYES: SWOLLEN
3768a	DS(3)	CHROMORHINORRHEA
	DS(9- 20)	NECK: ABRASION (0.5 CM X 0.5 CM)
	DS(10)	CHROMORHINORRHEA
3769a		NO ADVERSE FINDINGS
3770a	DS(26- 44)	TAIL: BENT
	DS(46- 91)	TAIL: BENT b
3771a	DS(10)	CHROMORHINORRHEA
3772	DS(29- 49)	LOCALIZED ALOPECIA: LIMB(S)
3773		NO ADVERSE FINDINGS
3774		NO ADVERSE FINDINGS
3775	DS(40- 91)	LOCALIZED ALOPECIA: LIMB(S)b

CLINICAL OBSERVATIONS APPEARED NORMAL UNLESS NOTED OTHERWISE

DS = DAY OF STUDY

a. Clinical observations were not recorded on Day 45 of study.

b. Observation confirmed at necropsy.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 51 (PAGE 5): CLINICAL OBSERVATIONS - INDIVIDUAL DATA - MALE RATS - CHOLINESTERASE SUBSET

RAT #		DESCRIPTION
DOSAGE GROUP V		10000 PPM
3711		NO ADVERSE FINDINGS
3712	DS(88- 91)	INCISOR(S): MISSING/BROKEN a
3713		NO ADVERSE FINDINGS
3714		NO ADVERSE FINDINGS
3715		NO ADVERSE FINDINGS
3716		NO ADVERSE FINDINGS
3717	DS(17- 19)	CHROMODACRYORRHEA
	DS(43- 44)	CHROMODACRYORRHEA
3718	DS(33- 91)	TAIL: BENT a
3719		NO ADVERSE FINDINGS
3720	DS(9- 58)	URINE-STAINED ABDOMINAL FUR
3721	DS(38- 40)	URINE-STAINED ABDOMINAL FUR
3722		NO ADVERSE FINDINGS
3723	DS(2)	DEHYDRATION - MILD b
3724		NO ADVERSE FINDINGS
3725		NO ADVERSE FINDINGS

CLINICAL OBSERVATIONS APPEARED NORMAL UNLESS NOTED OTHERWISE

DS = DAY OF STUDY

a. Observation confirmed at necropsy.

b. Dehydration was verified using a skin turgor test; this test is only conducted on rats based on other clinical signs and/or a reduction in body weight/feed consumption. Therefore, this clinical observation was not summarized or statistically analyzed.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 52 (PAGE 1): DETAILED CLINICAL OBSERVATIONS - INDIVIDUAL DATA - MALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP I		0 (CARRIER CONTROL) PPM
RAT #		DESCRIPTION
3786a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(1- 11)	SPARSE HAIR COAT: LIMB(S)
	WS(5- 11)	SPARSE HAIR COAT: UNDERSIDE
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	SPARSE HAIR COAT: LIMB(S)
3787a	WS(13)	SPARSE HAIR COAT: UNDERSIDE
	WS(1- 6)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(7- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(7- 11)	INCISOR(S): MISALIGNED
	WS(10- 11)	INCISOR(S): MISSING/BROKEN
3788a	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3789a	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(1- 10)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3790a	WS(11)	CHROMODACRYORRHEA
	WS(11)	LACRIMATION
	WS(11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	CHROMODACRYORRHEA
	WS(13)	LACRIMATION
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(1)	HEAD: SCAB (MULTIPLE PINPOINT)
	WS(1)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(2- 4)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(5)	TAIL: SCAB (MULTIPLE PINPOINT)
3791a	WS(5- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(5- 11)	TAIL: BENT
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	TAIL: BENT
	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(1- 11)	TAIL: BENT
	WS(6)	UNGROOMED COAT
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	TAIL: BENT
	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3792a	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3793a	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL

WS = WEEK OF STUDY

a. Detailed clinical observations were recorded twice during Week 11 (Days 71 and 77) and were not recorded on Week 12 of study.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 52 (PAGE 2): DETAILED CLINICAL OBSERVATIONS - INDIVIDUAL DATA - MALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP I		0 (CARRIER CONTROL) PPM
RAT #		DESCRIPTION
3794a	WS(1- 5)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(6- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(6- 11)	SPARSE HAIR COAT: LIMB(S)
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3795a	WS(1)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(2- 5)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(2- 5)	SPARSE HAIR COAT: LIMB(S)
	WS(6- 8)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(9- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(9- 11)	SPARSE HAIR COAT: LIMB(S)
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	SPARSE HAIR COAT: LIMB(S)
3796a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3797a	WS(1- 5)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(6)	CHROMODACRYORRHEA
	WS(6)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(7- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	LACRIMATION
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	INCISOR(S): MISALIGNED
3798a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3799a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3800a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL

WS = WEEK OF STUDY

a. Detailed clinical observations were recorded twice during Week 11 (Days 71 and 77) and were not recorded on Week 12 of study.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 52 (PAGE 3): DETAILED CLINICAL OBSERVATIONS - INDIVIDUAL DATA - MALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP II		100 PPM
RAT #		DESCRIPTION
3736a	WS(1- 6)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(7- 9)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(7- 9)	INCISOR(S): MISALIGNED
	WS(10- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	INCISOR(S): MISALIGNED
3737a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3738a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3739a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3740a	WS(1- 5)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(6)	CHROMORHINORRHEA
	WS(6)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(7- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3741a	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3742a	WS(1- 2)	HEAD: SCAB (0.2 CM IN DIAMETER)
	WS(1- 2)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(3)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(4- 5)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(4- 5)	HEAD: SCAB (0.2 CM IN DIAMETER)
	WS(5)	BACK: SCAB (0.2 CM IN DIAMETER)
	WS(6- 7)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(8)	CHROMODACRYORRHEA
	WS(8)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(8)	UNGROOMED COAT
	WS(9- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3743a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3744a	WS(1- 4)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(5- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(5- 11)	TAIL: BENT
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	TAIL: BENT

WS = WEEK OF STUDY

a. Detailed clinical observations were recorded twice during Week 11 (Days 71 and 77) and were not recorded on Week 12 of study.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 52 (PAGE 4): DETAILED CLINICAL OBSERVATIONS - INDIVIDUAL DATA - MALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP II		100 PPM
RAT #		DESCRIPTION
3745a	WS(1- 4)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(5- 7)	SPARSE HAIR COAT: LIMB(S)
	WS(5- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(8- 9)	BOTH EARS: SWOLLEN
	WS(8- 11)	LOCALIZED ALOPECIA: LIMB(S)
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
3746a	WS(13)	LOCALIZED ALOPECIA: LIMB(S)
	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3747a	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3748a	WS(11)	FOUND DEAD ON DAY 77 OF STUDY
	WS(1- 4)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(5)	TAIL: ABRASION (0.1 CM IN DIAMETER)
	WS(5)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(6- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3749a	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(1)	CHROMORHINORRHEA
	WS(1)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(2- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3750a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL

WS = WEEK OF STUDY

a. Detailed clinical observations were recorded twice during Week 11 (Days 71 and 77) and were not recorded on Week 12 of study.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 52 (PAGE 5): DETAILED CLINICAL OBSERVATIONS - INDIVIDUAL DATA - MALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP III		500 PPM
RAT #		DESCRIPTION
3811a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(11)	CHROMORHINORRHEA
	WS(11)	CHROMODACRYORRHEA
	WS(11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(11)	INCISOR(S): MISALIGNED
	WS(11)	INCISOR(S): MISSING/BROKEN
	WS(11)	UNGROOMED COAT
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	INCISOR(S): MISALIGNED
3812a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3813a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3814a	WS(1)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(2- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(2- 11)	SPARSE HAIR COAT: LIMB(S)
	WS(6)	CHROMORHINORRHEA
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
3815a	WS(13)	SPARSE HAIR COAT: LIMB(S)
	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(1- 11)	TAIL: BENT
	WS(5- 6)	SPARSE HAIR COAT: LIMB(S)
	WS(8- 10)	SWOLLEN EAR(S)
	WS(8- 11)	SPARSE HAIR COAT: LIMB(S)
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	TAIL: BENT
	WS(13)	SPARSE HAIR COAT: LIMB(S)

WS = WEEK OF STUDY

a. Detailed clinical observations were recorded twice during Week 11 (Days 71 and 77) and were not recorded on Week 12 of study.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 52 (PAGE 6): DETAILED CLINICAL OBSERVATIONS - INDIVIDUAL DATA - MALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP III		500 PPM
RAT #		DESCRIPTION
3816a	WS(1)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(2)	CHROMODACRYORRHEA
	WS(2- 3)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(3)	HEAD: ULCERATION (2.0 CM X 0.5 CM)
	WS(3- 5)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(6)	CHROMODACRYORRHEA
	WS(6)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(7- 8)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(9)	CHROMODACRYORRHEA
	WS(9- 10)	SPARSE HAIR COAT: LIMB(S)
	WS(9- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(11)	CHROMORHINORRHEA
	WS(11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(11)	SOFT OR LIQUID FECES
3817a	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(1- 2)	RIGHT EAR: SCAB (DID NOT EXCEED 0.5 CM IN DIAMETER)
	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(2- 9)	RIGHT EAR: SWOLLEN
	WS(5- 11)	TAIL: BENT
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
3818a	WS(13)	TAIL: BENT
	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3819a	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3820a	WS(13)	UNSCHEDULED EUTHANASIA ON DAY 86 OF STUDY DUE TO ADVERSE CLINICAL OBSERVATIONS
	WS(1)	HEAD: SCAB (0.1 CM IN DIAMETER)
	WS(1)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(2- 4)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(5- 9)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(5- 9)	SPARSE HAIR COAT: LIMB(S)
3821a	WS(10- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(1- 4)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(5- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(5- 11)	SPARSE HAIR COAT: LIMB(S)
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	SPARSE HAIR COAT: LIMB(S)

WS = WEEK OF STUDY

a. Detailed clinical observations were recorded twice during Week 11 (Days 71 and 77) and were not recorded on Week 12 of study.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 52 (PAGE 7): DETAILED CLINICAL OBSERVATIONS - INDIVIDUAL DATA - MALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP III		500 PPM
RAT #		DESCRIPTION
3822a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	RIGHT EAR: SWOLLEN
3823a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3824a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(11)	CHROMODACRYORRHEA
	WS(11)	LACRIMATION
	WS(11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3825a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL

WS = WEEK OF STUDY

a. Detailed clinical observations were recorded twice during Week 11 (Days 71 and 77) and were not recorded on Week 12 of study.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 52 (PAGE 8): DETAILED CLINICAL OBSERVATIONS - INDIVIDUAL DATA - MALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP IV		5000 PPM
RAT #		DESCRIPTION
3761a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEAR NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEAR NORMAL
3762a	WS(1- 5)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(6)	CHROMORHINORRHEA
	WS(6)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(7- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3763a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3764a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3765a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3766a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3767a	WS(1- 4)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(5)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(5)	HEAD: SWOLLEN
	WS(6- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3768a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3769a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3770a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(1- 11)	TAIL: BENT
	WS(8)	RIGHT FOREPAW: SWOLLEN
	WS(9)	CHROMORHINORRHEA
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	TAIL: BENT
3771a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(11)	MOUTH: LACERATION (0.2 CM X 0.1 CM)
	WS(11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3772a	WS(1- 5)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(6- 9)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(6- 9)	SPARSE HAIR COAT: LIMB(S)
	WS(10- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL

WS = WEEK OF STUDY

a. Detailed clinical observations were recorded twice during Week 11 (Days 71 and 77) and were not recorded on Week 12 of study.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 52 (PAGE 9): DETAILED CLINICAL OBSERVATIONS - INDIVIDUAL DATA - MALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP IV		5000 PPM
RAT #		DESCRIPTION
3773a	WS(1- 8)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(9)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(9)	SPARSE HAIR COAT: LIMB(S)
	WS(10- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3774a	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3775a	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(1- 4)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(5)	SPARSE HAIR COAT: LIMB(S)
	WS(5- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(6- 11)	LOCALIZED ALOPECIA: LIMB(S)
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	LOCALIZED ALOPECIA: LIMB(S)

WS = WEEK OF STUDY

a. Detailed clinical observations were recorded twice during Week 11 (Days 71 and 77) and were not recorded on Week 12 of study.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 52 (PAGE 10): DETAILED CLINICAL OBSERVATIONS - INDIVIDUAL DATA - MALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP V		10000 PPM
RAT #		DESCRIPTION
3711a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3712a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	INCISOR(S): MISALIGNED
	WS(13)	INCISOR(S): MISSING/BROKEN
3713a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3714a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3715a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3716a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3717a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3718a	WS(1- 4)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(5- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(5- 11)	TAIL: BENT
	WS(11)	SOFT OR LIQUID FECES
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	TAIL: BENT
3719a	WS(1)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(2)	CHROMORHINORRHEA
	WS(2)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(3- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3720a	WS(1)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(2- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(2- 11)	URINE-STAINED ABDOMINAL FUR
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	URINE-STAINED ABDOMINAL FUR

WS = WEEK OF STUDY

a. Detailed clinical observations were recorded twice during Week 11 (Days 71 and 77) and were not recorded on Week 12 of study.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 52 (PAGE 11): DETAILED CLINICAL OBSERVATIONS - INDIVIDUAL DATA - MALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP V		10000 PPM
RAT #		DESCRIPTION
3721a	WS(1- 5)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(6)	UNGROOMED COAT
	WS(6- 7)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(6- 7)	URINE-STAINED ABDOMINAL FUR
	WS(8)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(9)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(9)	CHROMORHINORRHEA
	WS(9)	UNGROOMED COAT
	WS(10- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3722a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3723a	WS(1- 4)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(5)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(5)	CHROMORHINORRHEA
	WS(6- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3724a	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3725a	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL

WS = WEEK OF STUDY

a. Detailed clinical observations were recorded twice during Week 11 (Days 71 and 77) and were not recorded on Week 12 of study.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 53 (PAGE 1): CLINICAL OBSERVATIONS - INDIVIDUAL DATA - FEMALE RATS - CHOLINESTERASE SUBSET

RAT #	DESCRIPTION
DOSAGE GROUP I	0 (CARRIER CONTROL) PPM
3911	NO ADVERSE FINDINGS
3912	NO ADVERSE FINDINGS
3913	NO ADVERSE FINDINGS
3914	NO ADVERSE FINDINGS
3915	NO ADVERSE FINDINGS
3916	NO ADVERSE FINDINGS
3917	NO ADVERSE FINDINGS
3918	NO ADVERSE FINDINGS
3919	NO ADVERSE FINDINGS
3920	NO ADVERSE FINDINGS
3921	NO ADVERSE FINDINGS
3922	NO ADVERSE FINDINGS
3923	DS (68) CHROMODACRYORRHEA
	DS (71- 91) INCISOR(S): MISALIGNED a
	DS (72) LACRIMATION
3924	NO ADVERSE FINDINGS
3925	DS (43- 91) SPARSE HAIR COAT: LIMB(S) a
	DS (78- 91) BOTH EARS: SWOLLEN a
DOSAGE GROUP II	100 PPM
3861	NO ADVERSE FINDINGS
3862	DS (39- 40) EXCESS SALIVATION - SLIGHT
	DS (58- 70) CHROMORHINORRHEA
3863	DS (32- 42) SPARSE HAIR COAT: LIMB(S)
	DS (32- 49) SPARSE HAIR COAT: BACK
3864	NO ADVERSE FINDINGS
3865	NO ADVERSE FINDINGS
3866	DS (78- 91) BOTH EARS: SWOLLEN a
3867	NO ADVERSE FINDINGS
3868	NO ADVERSE FINDINGS
3869	NO ADVERSE FINDINGS
3870	DS (32- 81) SPARSE HAIR COAT: LIMB(S)
3871	NO ADVERSE FINDINGS
3872	DS (1- 3) INCISOR(S): MISSING/BROKEN
	DS (77- 91) EXOPHTHALMOS a
3873	DS (32- 61) LOCALIZED ALOPECIA: LIMB(S)
	DS (71- 74) CHROMODACRYORRHEA
3874	NO ADVERSE FINDINGS
3875	NO ADVERSE FINDINGS

CLINICAL OBSERVATIONS APPEARED NORMAL UNLESS NOTED OTHERWISE

DS = DAY OF STUDY

a. Observation confirmed at necropsy.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 53 (PAGE 2): CLINICAL OBSERVATIONS - INDIVIDUAL DATA - FEMALE RATS - CHOLINESTERASE SUBSET

RAT #		DESCRIPTION
DOSAGE GROUP III		500 PPM
3936		NO ADVERSE FINDINGS
3937		NO ADVERSE FINDINGS
3938		NO ADVERSE FINDINGS
3939		NO ADVERSE FINDINGS
3940		NO ADVERSE FINDINGS
3941		NO ADVERSE FINDINGS
3942	DS (39- 61)	LOCALIZED ALOPECIA: LIMB(S)
3943		NO ADVERSE FINDINGS
3944		NO ADVERSE FINDINGS
3945		NO ADVERSE FINDINGS
3946		NO ADVERSE FINDINGS
3947		NO ADVERSE FINDINGS
3948		NO ADVERSE FINDINGS
3949	DS (51- 52)	CHROMODACRYORRHEA
	DS (51- 55)	INCISOR(S): MISALIGNED
	DS (58- 91)	INCISOR(S): MISALIGNED a
	DS (82- 88)	CHROMODACRYORRHEA
	DS (85)	SCANT FECES
	DS (85- 90)	MOUTH: ULCERATION (0.4 CM IN DIAMETER)
	DS (87- 88)	CHROMORHINORRHEA
	DS (91)	CHROMODACRYORRHEA a
3950		NO ADVERSE FINDINGS
DOSAGE GROUP IV		5000 PPM
3961	DS (23- 39)	INCISOR(S): MISALIGNED
	DS (24- 91)	INCISOR(S): MISSING/BROKEN a
3962	DS (25- 63)	SPARSE HAIR COAT: LIMB(S)
	DS (64- 91)	LOCALIZED ALOPECIA: LIMB(S) a
3963		NO ADVERSE FINDINGS
3964	DS (25- 91)	SPARSE HAIR COAT: LIMB(S) a
3965		NO ADVERSE FINDINGS
3966		NO ADVERSE FINDINGS
3967		NO ADVERSE FINDINGS
3968		NO ADVERSE FINDINGS
3969		NO ADVERSE FINDINGS
3970		NO ADVERSE FINDINGS
3971		NO ADVERSE FINDINGS
3972		NO ADVERSE FINDINGS
3973	DS (32- 91)	TAIL: BENT a
3974	DS (22- 91)	SPARSE HAIR COAT: LIMB(S) a
3975		NO ADVERSE FINDINGS

CLINICAL OBSERVATIONS APPEARED NORMAL UNLESS NOTED OTHERWISE

DS = DAY OF STUDY

a. Observation confirmed at necropsy.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 53 (PAGE 3): CLINICAL OBSERVATIONS - INDIVIDUAL DATA - FEMALE RATS - CHOLINESTERASE SUBSET

RAT #		DESCRIPTION
DOSAGE GROUP V		10000 PPM
3886	DS (57- 91)	URINE-STAINED ABDOMINAL FUR
3887	DS (29- 31)	URINE-STAINED ABDOMINAL FUR
	DS (35- 67)	URINE-STAINED ABDOMINAL FUR
	DS (64- 91)	SPARSE HAIR COAT: LIMB(S) a
	DS (71- 91)	URINE-STAINED ABDOMINAL FUR
	DS (91)	RIGHT EAR: SWOLLEN a
3888	DS (51- 53)	INCISOR(S): MISSING/BROKEN
3889	DS (29- 30)	CHROMODACRYORRHEA
	DS (85- 91)	URINE-STAINED ABDOMINAL FUR
3890		NO ADVERSE FINDINGS
3891	DS (50- 53)	CHROMODACRYORRHEA
	DS (56- 91)	CHROMODACRYORRHEA a
	DS (58)	LACRIMATION
	DS (71- 76)	SPARSE HAIR COAT: LIMB(S)
	DS (72- 75)	LACRIMATION
3892	DS (29- 31)	UNGROOMED COAT
	DS (35- 38)	URINE-STAINED ABDOMINAL FUR
3893	DS (29- 91)	URINE-STAINED ABDOMINAL FUR
3894		NO ADVERSE FINDINGS
3895		NO ADVERSE FINDINGS
3896		NO ADVERSE FINDINGS
3897		NO ADVERSE FINDINGS
3898		NO ADVERSE FINDINGS
3899		NO ADVERSE FINDINGS
3900	DS (72- 91)	BOTH EARS: SWOLLEN a

CLINICAL OBSERVATIONS APPEARED NORMAL UNLESS NOTED OTHERWISE

DS = DAY OF STUDY

a. Observation confirmed at necropsy.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 54 (PAGE 1): DETAILED CLINICAL OBSERVATIONS - INDIVIDUAL DATA - FEMALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP I		0 (CARRIER CONTROL) PPM
RAT #		DESCRIPTION
3911a	WS(1- 5)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(6)	SPARSE HAIR COAT: LIMB(S)
	WS(6- 7)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(7)	UNGROOMED COAT
	WS(8- 9)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(10- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(10- 11)	SPARSE HAIR COAT: LIMB(S)
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	SPARSE HAIR COAT: LIMB(S)
3912a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3913a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3914a	WS(1- 8)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(9)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(9)	INCISOR(S): MISALIGNED
	WS(10- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(11)	INCISOR(S): MISALIGNED
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3915a	WS(1- 3)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(4)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(4)	VOCALIZATION TO TOUCH
	WS(5- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	RIGHT EAR: SWOLLEN
3916a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3917a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3918a	WS(1- 8)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(9)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(9)	CHROMORHINORRHEA
	WS(10- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3919a	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL

WS = WEEK OF STUDY

a. Detailed clinical observations were recorded twice during Week 11 (Days 71 and 77) and were not recorded on Week 12 of study.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 54 (PAGE 2): DETAILED CLINICAL OBSERVATIONS - INDIVIDUAL DATA - FEMALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP I		0 (CARRIER CONTROL) PPM
RAT #		DESCRIPTION
3920a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3921a	WS(1- 4)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(5- 6)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(5)	TAIL: SCAB (PINPOINT)
	WS(6)	CHROMODACRYORRHEA
	WS(7- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3922a	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3922a	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(1- 10)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3923a	WS(11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(11)	CHROMORHINORRHEA
	WS(11)	CHROMODACRYORRHEA
	WS(11)	LACRIMATION
	WS(11)	INCISOR(S): MISALIGNED
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	CHROMODACRYORRHEA
	WS(13)	INCISOR(S): MISALIGNED
	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3924a	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	TAIL: SCAB (0.1 CM IN DIAMETER)
	WS(1- 5)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(6- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
3925a	WS(6- 11)	SPARSE HAIR COAT: LIMB(S)
	WS(9- 11)	BOTH EARS: SWOLLEN
	WS(11)	SPARSE HAIR COAT: BACK
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	BOTH EARS: SWOLLEN
	WS(13)	SPARSE HAIR COAT: LIMB(S)
	WS(13)	SPARSE HAIR COAT: BACK

WS = WEEK OF STUDY

a. Detailed clinical observations were recorded twice during Week 11 (Days 71 and 77) and were not recorded on Week 12 of study.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 54 (PAGE 3): DETAILED CLINICAL OBSERVATIONS - INDIVIDUAL DATA - FEMALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP II		100 PPM
RAT #		DESCRIPTION
3861a	WS (1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS (13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3862a	WS (1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS (13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS (13)	CHROMODACRYORRHEA
	WS (13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3863a	WS (1- 4)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS (5- 6)	SPARSE HAIR COAT: LIMB(S)
	WS (5- 7)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS (5- 7)	SPARSE HAIR COAT: BACK
	WS (8)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS (9- 10)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS (9- 10)	SPARSE HAIR COAT: LIMB(S)
	WS (11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS (13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3864a	WS (1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS (13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3865a	WS (1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS (13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3866a	WS (1- 6)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS (7- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS (7- 11)	BOTH EARS: SWOLLEN
	WS (13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS (13)	BOTH EARS: SWOLLEN
3867a	WS (1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS (13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3868a	WS (1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS (13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3869a	WS (1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS (13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3870a	WS (1- 4)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS (5- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS (5- 11)	SPARSE HAIR COAT: LIMB(S)
	WS (13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS (13)	SPARSE HAIR COAT: LIMB(S)

WS = WEEK OF STUDY

a. Detailed clinical observations were recorded twice during Week 11 (Days 71 and 77) and were not recorded on Week 12 of study.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 54 (PAGE 4): DETAILED CLINICAL OBSERVATIONS - INDIVIDUAL DATA - FEMALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP II		100 PPM
RAT #		DESCRIPTION
3871a	WS(1- 4)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(5- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(5- 11)	TAIL: BENT
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	TAIL: BENT
3872a	WS(13)	SPARSE HAIR COAT: LIMB(S)
	WS(1)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(1)	INCISOR(S): MISSING/BROKEN
	WS(2- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(11)	EXOPHTHALMOS
	WS(11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	EXOPHTHALMOS
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
3873a	WS(13)	SPARSE HAIR COAT: LIMB(S)
	WS(1- 3)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(4- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(4- 11)	LOCALIZED ALOPECIA: LIMB(S)
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
3874a	WS(13)	LOCALIZED ALOPECIA: LIMB(S)
	WS(1- 8)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(9)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(9)	CHROMORHINORRHEA
	WS(9)	CHROMODACRYORRHEA
3875a	WS(10- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL

WS = WEEK OF STUDY

a. Detailed clinical observations were recorded twice during Week 11 (Days 71 and 77) and were not recorded on Week 12 of study.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 54 (PAGE 5): DETAILED CLINICAL OBSERVATIONS - INDIVIDUAL DATA - FEMALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP III		500 PPM
RAT #		DESCRIPTION
3936a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3937a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3938a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3939a	WS(1- 8)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(9)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(9)	CHROMODACRYORRHEA
	WS(10- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3940a	WS(1- 8)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(9)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(9)	INCISOR(S): MISSING/BROKEN
	WS(10- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3941a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(11)	UNGROOMED COAT
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	UNGROOMED COAT
3942a	WS(1- 5)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(6- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(6- 11)	SPARSE HAIR COAT: LIMB(S)
	WS(11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3943a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3944a	WS(1)	CHROMORHINORRHEA
	WS(1)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(2- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3945a	WS(1- 8)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(9)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(9)	CHROMORHINORRHEA
	WS(10- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3946a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL

WS = WEEK OF STUDY

a. Detailed clinical observations were recorded twice during Week 11 (Days 71 and 77) and were not recorded on Week 12 of study.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 54 (PAGE 6): DETAILED CLINICAL OBSERVATIONS - INDIVIDUAL DATA - FEMALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP III		500 PPM
RAT #		DESCRIPTION
3947a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3948a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3949a	WS(1- 8)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(9)	CHROMODACRYORRHEA
	WS(9)	LACRIMATION
	WS(9- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(9- 11)	INCISOR(S): MISALIGNED
	WS(13)	CHROMODACRYORRHEA
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	INCISOR(S): MISALIGNED
3950a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL

WS = WEEK OF STUDY

a. Detailed clinical observations were recorded twice during Week 11 (Days 71 and 77) and were not recorded on Week 12 of study.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 54 (PAGE 7): DETAILED CLINICAL OBSERVATIONS - INDIVIDUAL DATA - FEMALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP IV		5000 PPM
RAT #		DESCRIPTION
3961a	WS(1- 3)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(4)	SNOUT: SWOLLEN
	WS(4- 5)	INCISOR(S): MISSING/BROKEN
	WS(4- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(4- 11)	INCISOR(S): MISALIGNED
	WS(6- 11)	INCISOR(S): MISSING/BROKEN
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	INCISOR(S): MISSING/BROKEN
	WS(13)	INCISOR(S): MISALIGNED
	WS(1- 3)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3962a	WS(4- 9)	SPARSE HAIR COAT: LIMB(S)
	WS(4- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(5)	MOUTH: ABRASION (0.1 CM IN DIAMETER)
	WS(7- 11)	LEFT EAR: DARK RED
	WS(10- 11)	LOCALIZED ALOPECIA: LIMB(S)
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	LEFT EAR: DARK RED
	WS(13)	LEFT EAR: SWOLLEN
	WS(13)	LOCALIZED ALOPECIA: LIMB(S)
	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3963a	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(1- 3)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3964a	WS(4)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(4)	SPARSE HAIR COAT: LIMB(S)
	WS(5)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(6)	UNGROOMED COAT
	WS(6- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(6- 11)	SPARSE HAIR COAT: LIMB(S)
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	RIGHT EAR: SWOLLEN
	WS(13)	SPARSE HAIR COAT: LIMB(S)
	WS(1- 5)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3965a	WS(6)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(6)	UNGROOMED COAT
	WS(7- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3966a	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3967a	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL

WS = WEEK OF STUDY

a. Detailed clinical observations were recorded twice during Week 11 (Days 71 and 77) and were not recorded on Week 12 of study.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 54 (PAGE 8): DETAILED CLINICAL OBSERVATIONS - INDIVIDUAL DATA - FEMALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP IV		5000 PPM
RAT #		DESCRIPTION
3968a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3969a	WS(1- 3)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(4)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(4)	CHROMORHINORRHEA
	WS(5- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3970a	WS(1- 2)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(3)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(3)	BACK: SCAB (0.2 CM IN DIAMETER)
	WS(4- 9)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(10)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(10)	INCISOR(S): MISSING/BROKEN
	WS(11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3971a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3972a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	SPARSE HAIR COAT: LIMB(S)
3973a	WS(1- 4)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(5- 10)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(5- 10)	TAIL: BENT
	WS(6)	SPARSE HAIR COAT: LIMB(S)
	WS(11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3974a	WS(1)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(2- 4)	SPARSE HAIR COAT: LIMB(S)
	WS(2- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(5- 11)	LOCALIZED ALOPECIA: LIMB(S)
	WS(10- 11)	BOTH EARS: SWOLLEN
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	TAIL: SCAB (0.1 CM IN DIAMETER)
	WS(13)	BOTH EARS: SWOLLEN
	WS(13)	LOCALIZED ALOPECIA: LIMB(S)
3975a	WS(1- 4)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(5)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(5)	CHROMODACRYORRHEA
	WS(6- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL

WS = WEEK OF STUDY

a. Detailed clinical observations were recorded twice during Week 11 (Days 71 and 77) and were not recorded on Week 12 of study.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 54 (PAGE 9): DETAILED CLINICAL OBSERVATIONS - INDIVIDUAL DATA - FEMALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP V		10000 PPM
RAT #		DESCRIPTION
3886a	WS (1- 4)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS (5)	CHROMODACRYORRHEA
	WS (5- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS (5- 11)	URINE-STAINED ABDOMINAL FUR
	WS (6- 10)	UNGROOMED COAT
	WS (13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
3887a	WS (13)	URINE-STAINED ABDOMINAL FUR
	WS (1- 3)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS (4- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS (4- 11)	URINE-STAINED ABDOMINAL FUR
	WS (9- 11)	SPARSE HAIR COAT: LIMB(S)
	WS (11)	RIGHT EAR: SWOLLEN
	WS (13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS (13)	RIGHT EAR: SWOLLEN
	WS (13)	SPARSE HAIR COAT: LIMB(S)
3888a	WS (13)	URINE-STAINED ABDOMINAL FUR
	WS (1- 3)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS (4)	CHROMODACRYORRHEA
	WS (4)	URINE-STAINED ABDOMINAL FUR
	WS (4- 5)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS (5)	CHROMORHINORRHEA
	WS (6- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS (13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3889a	WS (1- 2)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS (3)	BACK: SCAB (0.3 CM IN DIAMETER)
	WS (3- 5)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS (4)	CHROMORHINORRHEA
	WS (5)	CHROMODACRYORRHEA
	WS (6- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS (11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS (11)	URINE-STAINED ABDOMINAL FUR
	WS (13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
3890a	WS (13)	URINE-STAINED ABDOMINAL FUR
	WS (1- 8)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS (9)	CHROMORHINORRHEA
	WS (9)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS (10- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS (13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL

WS = WEEK OF STUDY

a. Detailed clinical observations were recorded twice during Week 11 (Days 71 and 77) and were not recorded on Week 12 of study.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 54 (PAGE 10): DETAILED CLINICAL OBSERVATIONS - INDIVIDUAL DATA - FEMALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP V		10000 PPM
RAT #		DESCRIPTION
3891a	WS(1- 7)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(8)	DEHYDRATION - MILD b
	WS(8- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(8- 11)	CHROMODACRYORRHEA
	WS(8- 11)	LACRIMATION
	WS(8- 11)	INCISOR(S): MISALIGNED
	WS(10- 11)	DEHYDRATION - MILD b
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	CHROMODACRYORRHEA
	WS(13)	LACRIMATION
	WS(13)	DEHYDRATION - MILD b
	WS(13)	INCISOR(S): MISALIGNED
	WS(13)	SPARSE HAIR COAT: LIMB(S)
	WS(1- 4)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3892a	WS(5- 6)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(5- 6)	URINE-STAINED ABDOMINAL FUR
	WS(5- 6)	UNGROOMED COAT
	WS(7- 8)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(9- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(9- 11)	UNGROOMED COAT
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	SPARSE HAIR COAT: LIMB(S)
3893a	WS(13)	UNGROOMED COAT
	WS(1- 3)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(4- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(4- 11)	URINE-STAINED ABDOMINAL FUR
	WS(6- 11)	UNGROOMED COAT
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
3894a	WS(13)	URINE-STAINED ABDOMINAL FUR
	WS(13)	UNGROOMED COAT
	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3895a	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(1- 10)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(11)	INCISOR(S): MISSING/BROKEN
	WS(11)	INCISOR(S): MISALIGNED
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	UNGROOMED COAT

WS = WEEK OF STUDY

- a. Detailed clinical observations were recorded twice during Week 11 (Days 71 and 77) and were not recorded on Week 12 of study.
- b. Dehydration was verified using a skin turgor test; this test is only conducted on rats based on other clinical signs and/or a reduction in body weight/feed consumption. Therefore, this clinical observation was not summarized or statistically analyzed.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 54 (PAGE 11): DETAILED CLINICAL OBSERVATIONS - INDIVIDUAL DATA - FEMALE RATS - CHOLINESTERASE SUBSET

DOSAGE GROUP V		10000 PPM
RAT #		DESCRIPTION
3896a	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3897a	WS(1- 5)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(6)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(6)	CHROMORHINORRHEA
	WS(7- 8)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(9)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(9)	SPARSE HAIR COAT: LIMB(S)
	WS(9)	UNGROOMED COAT
	WS(10- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3898a	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	SPARSE HAIR COAT: LIMB(S)
	WS(1- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(13)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
3899a	WS(1)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(2)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(2)	SPARSE HAIR COAT: NECK
	WS(3- 11)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(11)	LEFT EAR: SWOLLEN
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	LEFT EAR: SWOLLEN
3900a	WS(1- 9)	DETAILED CLINICAL OBSERVATIONS APPEARED NORMAL
	WS(10- 11)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(10)	LEFT EAR: SWOLLEN
	WS(11)	BOTH EARS: SWOLLEN
	WS(13)	DETAILED CLINICAL OBSERVATIONS DID NOT APPEAR NORMAL
	WS(13)	BOTH EARS: SWOLLEN
	WS(13)	SPARSE HAIR COAT: LIMB(S)

WS = WEEK OF STUDY

a. Detailed clinical observations were recorded twice during Week 11 (Days 71 and 77) and were not recorded on Week 12 of study.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 55 (PAGE 1): BODY WEIGHTS - INDIVIDUAL DATA - MALE RATS - CHOLINESTERASE SUBSET

RAT #	DOSAGE GROUP I													
	0 (CARRIER CONTROL) PPM													
	DAY 1	2	3	4	5	6	7	8	15	22	29	36	43	
3786	220.	223.	232.	242.	248.	260.	274.	277.	337.	390.	436.	463.	487.	
3787	233.	245.	255.	259.	273.	286.	301.	307.	376.	421.	470.	504.	524.	
3788	229.	241.	249.	254.	266.	278.	291.	295.	357.	400.	452.	482.	514.	
3789	254.	265.	274.	282.	295.	310.	324.	327.	378.	439.	494.	528.	556.	
3790	241.	252.	262.	274.	286.	302.	318.	320.	332.	445.	504.	540.	570.	
3791	223.	231.	239.	245.	255.	267.	276.	284.	336.	375.	419.	448.	472.	
3792	236.	248.	254.	263.	272.	284.	291.	298.	357.	405.	454.	483.	506.	
3793	257.	266.	275.	286.	297.	309.	322.	326.	406.	465.	537.	587.	626.	
3794	224.	233.	242.	248.	257.	266.	275.	283.	339.	374.	402.	434.	460.	
3795	238.	248.	255.	261.	275.	288.	302.	308.	374.	424.	484.	517.	548.	
3796	239.	252.	262.	274.	288.	300.	313.	319.	395.	450.	516.	552.	579.	
3797	237.	253.	262.	273.	284.	297.	312.	316.	383.	428.	481.	512.	539.	
3798	229.	239.	247.	254.	265.	277.	296.	303.	363.	400.	446.	473.	495.	
3799	249.	256.	268.	276.	292.	301.	315.	322.	394.	444.	501.	538.	585.	
3800	218.	224.	234.	244.	250.	264.	276.	283.	345.	386.	426.	458.	488.	
	DAY 50	57	64	71	78	85	91							
3786	513.	531.	547.	556.	575.	581.	596.							
3787	564.	593.	613.	635.	644.	668.	683.							
3788	540.	570.	586.	605.	625.	651.	654.							
3789	597.	619.	630.	656.	661.	687.	704.							
3790	616.	649.	663.	680.	698.	720.	730.							
3791	509.	539.	550.	565.	575.	596.	614.							
3792	535.	549.	572.	582.	589.	609.	617.							
3793	670.	702.	734.	754.	767.	783.	803.							
3794	485.	508.	524.	535.	531.	554.	572.							
3795	585.	607.	628.	646.	659.	680.	689.							
3796	611.	638.	652.	665.	671.	694.	712.							
3797	574.	591.	610.	627.	636.	629.	636.							
3798	525.	546.	565.	583.	593.	612.	623.							
3799	622.	648.	666.	690.	710.	732.	743.							
3800	526.	554.	578.	607.	618.	636.	660.							

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAY = DAY OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 55 (PAGE 2): BODY WEIGHTS - INDIVIDUAL DATA - MALE RATS - CHOLINESTERASE SUBSET

RAT #	DOSAGE GROUP II													
100 PPM														
	DAY	1	2	3	4	5	6	7	8	15	22	29	36	43
3736		218.	230.	237.	244.	255.	267.	279.	284.	345.	388.	422.	453.	473.
3737		239.	248.	258.	267.	279.	294.	310.	311.	378.	430.	482.	511.	546.
3738		214.	222.	230.	236.	245.	257.	268.	269.	320.	360.	402.	429.	451.
3739		251.	261.	272.	280.	294.	308.	324.	328.	395.	440.	500.	539.	575.
3740		237.	251.	260.	270.	282.	295.	310.	316.	388.	433.	482.	511.	552.
3741		253.	263.	275.	286.	299.	314.	326.	332.	406.	457.	519.	557.	591.
3742		214.	226.	234.	240.	251.	259.	273.	273.	339.	389.	440.	468.	500.
3743		243.	251.	259.	269.	278.	292.	303.	305.	373.	420.	473.	519.	549.
3744		220.	228.	238.	244.	254.	264.	279.	273.	337.	377.	427.	459.	492.
3745		227.	237.	246.	255.	266.	278.	289.	292.	355.	399.	449.	482.	513.
3746		223.	231.	241.	246.	257.	269.	277.	279.	337.	382.	433.	464.	492.
3747		249.	263.	273.	284.	298.	312.	327.	329.	422.	482.	549.	590.	636.
3748		228.	235.	240.	246.	256.	264.	276.	275.	332.	378.	423.	450.	481.
3749		235.	246.	257.	267.	280.	290.	308.	310.	385.	431.	480.	516.	543.
3750		216.	227.	233.	242.	251.	262.	271.	270.	341.	383.	426.	462.	496.
	DAY	50	57	64	71	78	85	91						
3736		509.	531.	546.	568.	584.	610.	630.						
3737		575.	597.	615.	634.	639.	668.	675.						
3738		480.	502.	508.	524.	531.	550.	563.						
3739		610.	634.	658.	674.	696.	707.	731.						
3740		582.	610.	633.	638.	654.	680.	702.						
3741		619.	646.	671.	687.	702.	728.	758.						
3742		542.	567.	592.	612.	621.	653.	672.						
3743		588.	616.	646.	668.	674.	695.	717.						
3744		525.	547.	567.	581.	587.	606.	626.						
3745		551.	577.	595.	607.	612.	640.	657.						
3746		530.	552.	575.	593.	600.	627.	642.						
3747		687.	726.	749.	772.	FOUND DEAD ON DAY 77 OF STUDY								
3748		515.	541.	557.	580.	596.	618.	641.						
3749		566.	591.	607.	619.	625.	647.	650.						
3750		528.	550.	568.	586.	604.	630.	644.						
ALL WEIGHTS WERE RECORDED IN GRAMS (G) . DAY = DAY OF STUDY														

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAY = DAY OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 55 (PAGE 3): BODY WEIGHTS - INDIVIDUAL DATA - MALE RATS - CHOLINESTERASE SUBSET

RAT #	DOSAGE GROUP III													
	500 PPM													
	DAY 1	2	3	4	5	6	7	8	15	22	29	36	43	
3811	220.	227.	238.	247.	255.	268.	272.	284.	350.	395.	444.	472.	503.	
3812	229.	239.	246.	258.	268.	278.	283.	296.	366.	411.	462.	498.	528.	
3813	219.	227.	235.	247.	259.	269.	277.	285.	361.	411.	465.	513.	548.	
3814	243.	252.	260.	270.	281.	289.	291.	302.	361.	402.	448.	476.	499.	
3815	224.	233.	242.	248.	258.	268.	272.	278.	337.	371.	412.	432.	456.	
3816	234.	243.	252.	259.	269.	282.	287.	294.	360.	404.	453.	496.	519.	
3817	209.	216.	224.	234.	241.	254.	260.	267.	329.	387.	440.	482.	529.	
3818	262.	271.	280.	294.	308.	317.	327.	346.	428.	503.	568.	623.	656.	
3819	223.	230.	239.	246.	256.	265.	270.	279.	339.	380.	421.	454.	474.	
3820	243.	253.	264.	273.	287.	299.	303.	315.	373.	417.	455.	493.	529.	
3821	227.	234.	244.	254.	267.	277.	284.	293.	362.	414.	468.	502.	543.	
3822	240.	250.	255.	263.	272.	280.	286.	294.	353.	396.	436.	470.	496.	
3823	227.	238.	248.	255.	266.	276.	283.	293.	363.	417.	472.	504.	538.	
3824	250.	264.	275.	285.	298.	312.	315.	328.	405.	452.	512.	556.	601.	
3825	241.	256.	264.	274.	283.	290.	295.	306.	387.	441.	505.	545.	581.	
	DAY 50	57	64	71	78	85	91							
3811	529.	542.	570.	585.	572.	590.	628.							
3812	557.	580.	604.	614.	631.	642.	658.							
3813	587.	617.	636.	664.	681.	698.	724.							
3814	527.	552.	579.	594.	605.	614.	644.							
3815	491.	512.	542.	565.	570.	583.	605.							
3816	544.	562.	586.	599.	595.	612.	627.							
3817	567.	589.	618.	647.	653.	670.	706.							
3818	698.	727.	751.	772.	784.	798.	819.							
3819	509.	535.	559.	572.	582.	602.	a							
3820	562.	591.	620.	632.	641.	652.	682.							
3821	582.	617.	643.	664.	671.	695.	721.							
3822	522.	548.	567.	588.	600.	608.	621.							
3823	563.	596.	621.	639.	652.	667.	689.							
3824	639.	679.	705.	738.	750.	766.	799.							
3825	622.	650.	685.	714.	732.	764.	787.							

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAY = DAY OF STUDY

a. Rat 3819 was euthanized on Day 86 of study due to adverse clinical observations.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 55 (PAGE 4): BODY WEIGHTS - INDIVIDUAL DATA - MALE RATS - CHOLINESTERASE SUBSET

RAT #	DOSAGE GROUP IV												
	5000 PPM												
	DAY 1	2	3	4	5	6	7	8	15	22	29	36	43
3761	220.	228.	240.	249.	260.	270.	275.	285.	354.	386.	418.	455.	484.
3762	233.	234.	248.	254.	262.	282.	284.	291.	363.	403.	435.	466.	496.
3763	217.	224.	234.	243.	253.	262.	269.	280.	345.	384.	426.	459.	483.
3764	244.	247.	258.	266.	274.	287.	294.	305.	365.	401.	440.	467.	488.
3765	239.	239.	254.	262.	277.	290.	299.	307.	384.	439.	482.	516.	543.
3766	238.	247.	260.	268.	282.	294.	302.	312.	379.	428.	464.	504.	534.
3767	221.	225.	228.	240.	251.	263.	265.	276.	342.	381.	423.	450.	475.
3768	246.	252.	265.	270.	280.	296.	300.	307.	374.	429.	473.	515.	549.
3769	226.	222.	231.	239.	250.	258.	264.	270.	328.	364.	415.	455.	480.
3770	241.	246.	259.	270.	279.	293.	294.	305.	373.	416.	461.	491.	508.
3771	214.	216.	227.	235.	244.	252.	252.	261.	305.	340.	375.	399.	416.
3772	238.	246.	258.	269.	279.	291.	297.	305.	373.	421.	464.	503.	527.
3773	213.	211.	224.	231.	240.	246.	256.	262.	318.	351.	370.	396.	413.
3774	243.	244.	253.	263.	278.	290.	294.	304.	386.	427.	477.	512.	547.
3775	256.	259.	271.	284.	298.	314.	319.	329.	398.	441.	500.	537.	563.
	DAY 50	57	64	71	78	85	91						
3761	517.	538.	560.	575.	588.	596.	623.						
3762	519.	536.	552.	574.	586.	593.	608.						
3763	510.	526.	553.	557.	566.	572.	596.						
3764	516.	528.	552.	557.	563.	574.	601.						
3765	571.	595.	616.	628.	638.	650.	666.						
3766	563.	582.	601.	616.	637.	643.	671.						
3767	499.	515.	533.	544.	554.	561.	573.						
3768	576.	602.	622.	639.	646.	661.	679.						
3769	523.	559.	584.	601.	601.	629.	657.						
3770	532.	547.	565.	580.	590.	613.	630.						
3771	440.	463.	472.	488.	501.	517.	531.						
3772	518.	583.	607.	617.	634.	645.	673.						
3773	437.	451.	477.	486.	495.	512.	530.						
3774	581.	613.	633.	648.	663.	675.	693.						
3775	602.	623.	644.	665.	673.	680.	704.						

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAY = DAY OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 55 (PAGE 5): BODY WEIGHTS - INDIVIDUAL DATA - MALE RATS - CHOLINESTERASE SUBSET

RAT #	DOSAGE GROUP V													
	10000 PPM													
	DAY 1	2	3	4	5	6	7	8	15	22	29	36	43	
3711	219.	217.	220.	224.	237.	241.	250.	256.	320.	361.	402.	429.	450.	
3712	231.	226.	232.	244.	255.	262.	269.	279.	342.	388.	422.	455.	479.	
3713	201.	197.	202.	205.	209.	216.	228.	232.	291.	325.	360.	385.	404.	
3714	251.	250.	252.	261.	275.	282.	296.	307.	373.	416.	465.	499.	532.	
3715	224.	220.	224.	230.	240.	245.	256.	260.	326.	366.	413.	453.	490.	
3716	243.	240.	238.	246.	257.	265.	278.	290.	366.	410.	458.	503.	537.	
3717	227.	219.	231.	241.	251.	266.	273.	284.	356.	380.	416.	436.	465.	
3718	245.	244.	246.	252.	266.	276.	285.	294.	361.	401.	439.	473.	494.	
3719	212.	209.	216.	218.	228.	233.	238.	246.	296.	328.	365.	393.	408.	
3720	232.	219.	228.	227.	242.	247.	256.	265.	327.	356.	390.	417.	442.	
3721	220.	216.	227.	232.	243.	250.	255.	264.	326.	366.	413.	455.	483.	
3722	235.	218.	224.	227.	232.	240.	248.	258.	308.	337.	362.	386.	406.	
3723	228.	201.	215.	222.	235.	242.	250.	261.	324.	363.	396.	423.	452.	
3724	237.	238.	241.	251.	262.	269.	277.	287.	342.	384.	425.	461.	492.	
3725	243.	242.	248.	256.	267.	274.	279.	284.	345.	373.	413.	442.	466.	
	DAY 50	57	64	71	78	85	91							
3711	478.	499.	522.	537.	555.	574.	590.							
3712	501.	516.	533.	546.	554.	559.	571.							
3713	429.	446.	461.	479.	483.	496.	515.							
3714	559.	582.	601.	617.	626.	639.	660.							
3715	517.	546.	572.	588.	607.	617.	643.							
3716	572.	594.	614.	621.	636.	653.	676.							
3717	490.	506.	522.	542.	548.	561.	584.							
3718	516.	540.	560.	566.	580.	597.	617.							
3719	434.	462.	476.	492.	503.	509.	528.							
3720	478.	501.	520.	542.	551.	556.	582.							
3721	508.	542.	562.	568.	588.	594.	616.							
3722	427.	443.	461.	474.	485.	494.	518.							
3723	476.	493.	513.	520.	528.	539.	566.							
3724	523.	546.	570.	582.	600.	618.	637.							
3725	492.	515.	525.	542.	558.	571.	595.							

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAY = DAY OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 56 (PAGE 1): BODY WEIGHTS - INDIVIDUAL DATA - FEMALE RATS - CHOLINESTERASE SUBSET

RAT #	0 (CARRIER CONTROL) PPM													
DAY	1	2	3	4	5	6	7	8	15	22	29	36	43	
3911	184.	189.	189.	188.	194.	201.	204.	204.	236.	260.	281.	290.	309.	
3912	187.	190.	193.	196.	202.	209.	210.	214.	241.	261.	272.	278.	295.	
3913	179.	182.	182.	191.	194.	196.	196.	202.	228.	251.	269.	282.	292.	
3914	196.	200.	206.	210.	210.	220.	218.	223.	254.	282.	302.	324.	337.	
3915	174.	181.	184.	183.	190.	197.	198.	197.	225.	252.	258.	276.	292.	
3916	187.	191.	193.	199.	204.	207.	208.	215.	236.	256.	280.	290.	300.	
3917	166.	170.	172.	171.	179.	186.	186.	188.	206.	223.	227.	232.	250.	
3918	199.	199.	208.	212.	215.	222.	225.	231.	259.	279.	301.	310.	321.	
3919	172.	177.	182.	184.	187.	197.	199.	197.	229.	250.	264.	279.	297.	
3920	177.	181.	185.	191.	192.	196.	199.	201.	220.	233.	241.	252.	263.	
3921	185.	190.	192.	195.	198.	206.	210.	216.	236.	249.	266.	281.	287.	
3922	187.	190.	194.	198.	199.	203.	204.	206.	228.	251.	255.	260.	265.	
3923	167.	173.	174.	175.	181.	188.	188.	191.	208.	234.	237.	248.	262.	
3924	194.	198.	200.	202.	209.	216.	217.	223.	246.	274.	280.	287.	301.	
3925	183.	188.	192.	196.	199.	202.	207.	210.	235.	258.	271.	287.	305.	
DAY	50	57	64	71	78	85	91							
3911	319.	327.	336.	348.	343.	362.	354.							
3912	312.	316.	321.	331.	335.	343.	350.							
3913	302.	307.	308.	312.	318.	326.	331.							
3914	352.	362.	374.	388.	384.	386.	400.							
3915	301.	312.	311.	318.	326.	338.	351.							
3916	315.	328.	333.	336.	347.	356.	362.							
3917	259.	257.	257.	265.	275.	278.	282.							
3918	326.	338.	345.	346.	345.	356.	363.							
3919	305.	306.	321.	328.	324.	340.	343.							
3920	266.	270.	277.	277.	276.	278.	288.							
3921	307.	305.	320.	319.	329.	327.	338.							
3922	286.	292.	291.	304.	318.	324.	335.							
3923	268.	270.	280.	284.	276.	284.	275.							
3924	310.	316.	319.	324.	333.	322.	331.							
3925	313.	321.	324.	331.	333.	339.	354.							
ALL WEIGHTS WERE RECORDED IN GRAMS (G) . DAY = DAY OF STUDY														

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAY = DAY OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 56 (PAGE 2): BODY WEIGHTS - INDIVIDUAL DATA - FEMALE RATS - CHOLINESTERASE SUBSET

RAT #	DOSAGE GROUP II													
	100 PPM													
	DAY 1	2	3	4	5	6	7	8	15	22	29	36	43	
3861	177.	184.	189.	189.	192.	198.	202.	203.	224.	239.	245.	261.	276.	
3862	182.	184.	189.	191.	186.	195.	201.	204.	226.	241.	250.	274.	286.	
3863	169.	172.	172.	178.	183.	187.	185.	192.	214.	238.	258.	269.	277.	
3864	216.	231.	235.	240.	241.	243.	247.	255.	270.	281.	296.	311.	318.	
3865	187.	189.	193.	199.	202.	204.	210.	218.	242.	263.	280.	288.	300.	
3866	187.	192.	197.	199.	200.	209.	213.	214.	236.	254.	273.	286.	296.	
3867	186.	184.	182.	190.	195.	195.	194.	203.	214.	240.	277.	293.	309.	
3868	190.	197.	201.	206.	208.	215.	221.	224.	249.	268.	280.	295.	310.	
3869	186.	188.	192.	198.	201.	205.	210.	215.	234.	251.	264.	278.	286.	
3870	196.	198.	202.	209.	213.	216.	222.	232.	252.	267.	291.	307.	317.	
3871	172.	179.	181.	185.	186.	188.	194.	193.	209.	217.	218.	227.	237.	
3872	188.	190.	186.	190.	198.	197.	193.	204.	212.	226.	241.	251.	255.	
3873	168.	174.	178.	178.	178.	187.	189.	191.	216.	237.	248.	268.	280.	
3874	177.	181.	185.	189.	193.	200.	201.	201.	232.	248.	262.	282.	293.	
3875	189.	195.	201.	206.	204.	215.	219.	222.	254.	279.	300.	316.	329.	
	DAY 50	57	64	71	78	85	91							
3861	286.	281.	286.	293.	293.	296.	308.							
3862	306.	302.	320.	337.	338.	346.	368.							
3863	292.	303.	306.	310.	318.	326.	330.							
3864	332.	334.	345.	346.	349.	354.	366.							
3865	312.	311.	320.	321.	320.	324.	334.							
3866	308.	312.	316.	323.	326.	326.	343.							
3867	319.	335.	340.	348.	353.	367.	371.							
3868	318.	320.	331.	338.	343.	345.	363.							
3869	290.	301.	311.	315.	313.	319.	318.							
3870	323.	333.	345.	341.	348.	357.	366.							
3871	241.	243.	251.	254.	259.	259.	270.							
3872	262.	264.	262.	262.	268.	278.	275.							
3873	287.	292.	305.	311.	319.	320.	342.							
3874	301.	307.	320.	328.	333.	340.	359.							
3875	338.	346.	357.	358.	363.	366.	384.							

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAY = DAY OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 56 (PAGE 3): BODY WEIGHTS - INDIVIDUAL DATA - FEMALE RATS - CHOLINESTERASE SUBSET

RAT #	DOSAGE GROUP III												
	500 PPM												
	DAY 1	2	3	4	5	6	7	8	15	22	29	36	43
3936	192.	198.	201.	206.	213.	217.	218.	225.	258.	285.	309.	320.	331.
3937	188.	192.	197.	202.	202.	208.	214.	218.	235.	248.	265.	278.	288.
3938	168.	173.	172.	178.	180.	184.	185.	193.	205.	225.	241.	248.	261.
3939	190.	197.	200.	202.	205.	214.	212.	214.	242.	265.	281.	291.	302.
3940	177.	178.	182.	189.	192.	194.	198.	205.	224.	240.	265.	270.	279.
3941	170.	172.	179.	180.	182.	184.	188.	194.	210.	222.	241.	252.	260.
3942	171.	177.	181.	184.	189.	193.	195.	198.	228.	255.	277.	286.	304.
3943	184.	189.	190.	191.	191.	196.	198.	197.	221.	238.	250.	257.	266.
3944	182.	186.	190.	196.	200.	206.	209.	216.	246.	269.	276.	305.	316.
3945	175.	182.	185.	184.	189.	192.	196.	196.	224.	237.	249.	260.	277.
3946	169.	169.	172.	177.	182.	184.	184.	188.	220.	241.	248.	262.	274.
3947	189.	194.	198.	199.	206.	210.	211.	215.	249.	279.	294.	309.	323.
3948	181.	179.	188.	190.	195.	195.	199.	206.	229.	253.	285.	303.	310.
3949	192.	199.	204.	209.	213.	218.	221.	222.	250.	278.	295.	304.	317.
3950	184.	186.	190.	197.	198.	203.	208.	216.	228.	244.	257.	274.	282.
	DAY 50	57	64	71	78	85	91						
3936	342.	349.	350.	350.	354.	363.	370.						
3937	293.	298.	306.	307.	310.	312.	326.						
3938	270.	278.	282.	286.	290.	298.	308.						
3939	310.	317.	324.	336.	348.	348.	359.						
3940	280.	294.	296.	293.	296.	304.	309.						
3941	263.	275.	278.	279.	284.	289.	297.						
3942	314.	324.	332.	340.	347.	353.	365.						
3943	281.	288.	295.	302.	306.	318.	323.						
3944	320.	326.	338.	342.	351.	357.	365.						
3945	286.	291.	296.	300.	312.	317.	334.						
3946	288.	292.	298.	304.	307.	316.	326.						
3947	340.	346.	354.	359.	375.	377.	396.						
3948	328.	344.	354.	364.	370.	383.	394.						
3949	336.	339.	342.	347.	355.	338.	379.						
3950	285.	292.	298.	304.	309.	314.	322.						

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAY = DAY OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 56 (PAGE 4): BODY WEIGHTS - INDIVIDUAL DATA - FEMALE RATS - CHOLINESTERASE SUBSET

RAT #	DOSAGE GROUP IV													
	5000 PPM													
	DAY 1	2	3	4	5	6	7	8	15	22	29	36	43	
3961	198.	201.	207.	214.	218.	224.	227.	231.	264.	273.	278.	295.	312.	
3962	183.	179.	186.	185.	191.	197.	199.	198.	220.	238.	254.	266.	277.	
3963	168.	166.	164.	172.	177.	177.	178.	184.	208.	228.	253.	266.	277.	
3964	217.	218.	222.	231.	234.	238.	239.	250.	267.	290.	313.	318.	328.	
3965	186.	183.	188.	190.	192.	195.	195.	196.	217.	234.	240.	249.	261.	
3966	174.	174.	181.	181.	184.	192.	194.	195.	217.	231.	232.	261.	273.	
3967	165.	166.	175.	177.	177.	184.	185.	184.	202.	217.	222.	232.	246.	
3968	179.	178.	187.	194.	196.	197.	201.	208.	227.	238.	251.	269.	280.	
3969	178.	179.	184.	187.	186.	194.	200.	204.	237.	265.	283.	303.	321.	
3970	195.	195.	194.	196.	207.	210.	213.	215.	252.	285.	327.	330.	336.	
3971	166.	168.	174.	179.	184.	188.	191.	194.	213.	228.	240.	253.	259.	
3972	192.	191.	200.	204.	204.	207.	215.	220.	248.	269.	284.	310.	319.	
3973	180.	184.	187.	193.	196.	197.	204.	211.	238.	264.	277.	292.	299.	
3974	180.	183.	190.	191.	197.	198.	202.	202.	223.	241.	241.	255.	267.	
3975	166.	171.	174.	181.	184.	186.	193.	196.	217.	236.	247.	259.	273.	
	DAY 50	57	64	71	78	85	91							
3961	320.	333.	341.	350.	358.	366.	384.							
3962	294.	299.	307.	317.	322.	327.	337.							
3963	292.	304.	316.	319.	326.	330.	337.							
3964	337.	347.	353.	357.	360.	377.	373.							
3965	273.	278.	277.	284.	293.	297.	302.							
3966	278.	274.	278.	288.	287.	287.	300.							
3967	248.	247.	254.	261.	264.	265.	269.							
3968	286.	293.	292.	299.	306.	306.	312.							
3969	329.	334.	342.	348.	355.	364.	374.							
3970	356.	379.	413.	418.	414.	404.	403.							
3971	263.	272.	278.	278.	279.	285.	294.							
3972	328.	338.	346.	363.	370.	376.	398.							
3973	310.	314.	321.	327.	329.	331.	338.							
3974	276.	276.	276.	281.	286.	286.	296.							
3975	273.	278.	288.	294.	296.	294.	310.							

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAY = DAY OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 56 (PAGE 5): BODY WEIGHTS - INDIVIDUAL DATA - FEMALE RATS - CHOLINESTERASE SUBSET

RAT #	DOSAGE GROUP V													
	10000 PPM													
	DAY 1	2	3	4	5	6	7	8	15	22	29	36	43	
3886	188.	186.	194.	200.	201.	207.	212.	215.	239.	252.	263.	284.	294.	
3887	192.	184.	193.	194.	199.	203.	207.	208.	238.	260.	273.	285.	302.	
3888	178.	177.	177.	183.	185.	187.	187.	192.	208.	223.	238.	252.	263.	
3889	190.	173.	184.	192.	195.	200.	204.	209.	234.	250.	247.	278.	284.	
3890	181.	178.	184.	187.	188.	192.	197.	200.	213.	218.	224.	237.	244.	
3891	170.	159.	164.	168.	173.	178.	175.	180.	198.	209.	221.	229.	238.	
3892	174.	170.	178.	182.	183.	184.	187.	196.	211.	227.	236.	245.	257.	
3893	189.	176.	183.	192.	192.	199.	200.	204.	229.	252.	247.	273.	280.	
3894	183.	166.	168.	178.	181.	189.	190.	192.	217.	232.	259.	280.	304.	
3895	206.	203.	208.	212.	207.	212.	213.	225.	242.	272.	282.	304.	314.	
3896	163.	158.	160.	163.	169.	173.	176.	177.	202.	223.	236.	248.	256.	
3897	182.	174.	184.	185.	188.	192.	193.	195.	221.	236.	248.	250.	258.	
3898	172.	161.	166.	172.	174.	175.	176.	185.	193.	207.	221.	228.	235.	
3899	188.	186.	189.	195.	199.	206.	205.	212.	244.	272.	281.	292.	306.	
3900	186.	182.	188.	192.	197.	202.	207.	212.	240.	259.	276.	287.	298.	
	DAY 50	57	64	71	78	85	91							
3886	299.	304.	318.	321.	327.	332.	350.							
3887	313.	321.	322.	327.	336.	342.	354.							
3888	278.	286.	287.	296.	302.	308.	317.							
3889	287.	292.	297.	302.	295.	303.	306.							
3890	245.	250.	256.	260.	258.	263.	269.							
3891	232.	244.	246.	252.	255.	255.	262.							
3892	263.	263.	265.	268.	266.	277.	279.							
3893	291.	294.	296.	299.	312.	316.	318.							
3894	322.	336.	349.	360.	371.	381.	404.							
3895	341.	376.	396.	404.	422.	412.	415.							
3896	266.	267.	270.	272.	277.	279.	292.							
3897	269.	275.	274.	280.	287.	288.	296.							
3898	244.	250.	250.	252.	260.	270.	272.							
3899	321.	322.	333.	332.	344.	354.	360.							
3900	304.	310.	319.	317.	320.	328.	334.							

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAY = DAY OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 57 (PAGE 1): FEED CONSUMPTION VALUES - INDIVIDUAL DATA - MALE RATS - CHOLINESTERASE SUBSET

RAT #	DOSAGE GROUP I			0 (CARRIER CONTROL) PPM										
	DAYS	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7	7 - 8	8 - 15	15 - 22	22 - 29	29 - 36	36 - 43	43 - 50
3786		23.	22.	23.	21.	22.	23.	23.	157.	183.	178.	178.	168.	168.
3787		28.	26.	25.	25.	25.	24.	26.	182.	189.	189.	200.	183.	179.
3788		29.	27.	27.	26.	25.	26.	25.	183.	197.	203.	189.	186.	185.
3789		28.	25.	26.	26.	28.	27.	26.	167.	186.	185.	193.	191.	191.
3790		29.	29.	31.	28.	30.	29.	27.	214.	225.	237.	230.	228.	224.
3791		25.	24.	22.	24.	24.	23.	23.	175.	182.	183.	186.	173.	186.
3792		27.	24.	26.	23.	25.	22.	24.	168.	183.	180.	179.	175.	172.
3793		30.	29.	29.	26.	28.	28.	29.	206.	229.	232.	240.	230.	231.
3794		26.	26.	22.	22.	24.	23.	24.	173.	179.	161.	179.	174.	168.
3795		28.	25.	25.	26.	27.	29.	31.	187.	275.	211.	208.	202.	194.
3796		30.	30.	29.	27.	28.	28.	27.	205.	222.	216.	208.	196.	198.
3797		26.	27.	28.	26.	26.	27.	26.	183.	188.	a	195.	188.	185.
3798		28.	24.	26.	25.	25.	27.	27.	171.	181.	171.	178.	175.	174.
3799		26.	25.	27.	27.	26.	27.	29.	201.	214.	204.	201.	209.	201.
3800		23.	23.	25.	22.	25.	25.	26.	180.	188.	178.	184.	179.	182.
	DAYS	50 - 57	57 - 64	64 - 71	71 - 78	78 - 85	85 - 91							
3786		162.	168.	163.	163.	150.	139.							
3787		198.	198.	191.	192.	186.	163.							
3788		190.	193.	191.	188.	187.	133.							
3789		203.	195.	191.	175.	195.	169.							
3790		229.	226.	207.	209.	209.	182.							
3791		182.	180.	172.	168.	168.	157.							
3792		167.	172.	158.	166.	167.	141.							
3793		229.	236.	236.	212.	203.	186.							
3794		167.	166.	161.	75.	158.	154.							
3795		186.	187.	188.	195.	186.	152.							
3796		204.	206.	191.	190.	179.	182.							
3797		180.	184.	179.	176.	132.	97.							
3798		176.	182.	170.	170.	163.	133.							
3799		207.	208.	193.	192.	190.	167.							
3800		186.	193.	194.	194.	171.	161.							

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAYS = DAYS OF STUDY

a. Value was not recorded.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 57 (PAGE 2): FEED CONSUMPTION VALUES - INDIVIDUAL DATA - MALE RATS - CHOLINESTERASE SUBSET

RAT #	DOSAGE GROUP II														100 PPM													
	DAYS	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7	7 - 8	8 - 15	15 - 22	22 - 29	29 - 36	36 - 43	43 - 50														
3736		25.	24.	24.	25.	24.	23.	24.	173.	181.	177.	171.	173.	161.														
3737		27.	26.	26.	25.	27.	26.	26.	186.	201.	197.	195.	197.	191.														
3738		26.	23.	23.	23.	22.	23.	22.	160.	175.	170.	176.	171.	166.														
3739		31.	28.	29.	29.	29.	29.	32.	214.	223.	207.	214.	223.	210.														
3740		32.	29.	29.	29.	27.	30.	30.	209.	221.	213.	227.	225.	215.														
3741		30.	29.	30.	27.	29.	26.	31.	202.	199.	214.	219.	218.	205.														
3742		26.	23.	23.	22.	21.	22.	25.	164.	181.	180.	163.	191.	183.														
3743		26.	26.	25.	25.	24.	25.	26.	180.	193.	188.	204.	202.	203.														
3744		25.	23.	24.	22.	24.	24.	23.	166.	183.	190.	197.	198.	185.														
3745		26.	27.	25.	25.	25.	26.	27.	178.	193.	184.	189.	188.	190.														
3746		25.	25.	24.	22.	24.	22.	23.	156.	169.	174.	177.	173.	179.														
3747		34.	29.	32.	30.	29.	31.	31.	226.	239.	235.	243.	253.	245.														
3748		26.	22.	23.	22.	21.	22.	22.	148.	170.	171.	172.	169.	173.														
3749		28.	27.	27.	27.	26.	29.	30.	203.	206.	194.	203.	197.	185.														
3750		25.	23.	22.	23.	22.	22.	21.	167.	175.	173.	177.	183.	179.														
	DAYS	50 - 57	57 - 64	64 - 71	71 - 78	78 - 85	85 - 91																					
3736		170.	180.	179.	179.	175.	159.																					
3737		186.	190.	186.	175.	178.	148.																					
3738		164.	162.	159.	159.	153.	133.																					
3739		209.	209.	206.	217.	196.	176.																					
3740		217.	219.	193.	211.	199.	181.																					
3741		207.	210.	205.	207.	206.	192.																					
3742		183.	195.	181.	168.	181.	159.																					
3743		198.	215.	201.	194.	194.	178.																					
3744		182.	181.	179.	160.	170.	153.																					
3745		189.	194.	183.	168.	188.	170.																					
3746		176.	184.	176.	160.	173.	155.																					
3747		242.	233.	246.	FOUND DEAD ON DAY 77 OF STUDY																							
3748		175.	175.	173.	176.	173.	151.																					
3749		185.	190.	181.	175.	168.	138.																					
3750		179.	175.	171.	184.	185.	161.																					
ALL WEIGHTS WERE RECORDED IN GRAMS (G) ,															DAYS = DAYS OF STUDY													

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAYS = DAYS OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 57 (PAGE 3): FEED CONSUMPTION VALUES - INDIVIDUAL DATA - MALE RATS - CHOLINESTERASE SUBSET

RAT #	DOSAGE GROUP III												500 PPM				
	DAYS	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7	7 - 8	8 - 15	15 - 22	22 - 29	29 - 36	36 - 43	43 - 50			
3811		24.	24.	25.	21.	24.	24.	24.	175.	183.	182.	180.	182.	175.			
3812		25.	24.	25.	24.	24.	26.	25.	184.	189.	184.	190.	189.	189.			
3813		26.	26.	29.	27.	25.	30.	25.	199.	203.	203.	213.	216.	222.			
3814		27.	25.	26.	25.	24.	24.	26.	178.	191.	190.	195.	183.	194.			
3815		28.	27.	26.	25.	23.	26.	24.	179.	197.	174.	188.	180.	203.			
3816		26.	23.	24.	25.	22.	25.	24.	170.	179.	181.	191.	186.	180.			
3817		24.	21.	24.	21.	24.	24.	22.	169.	191.	192.	194.	203.	203.			
3818		29.	28.	29.	28.	26.	32.	32.	209.	236.	220.	234.	230.	226.			
3819		25.	23.	23.	24.	21.	25.	25.	165.	176.	180.	187.	182.	183.			
3820		29.	26.	27.	28.	26.	29.	27.	172.	181.	178.	196.	194.	193.			
3821		27.	26.	27.	26.	26.	27.	26.	191.	204.	201.	199.	205.	208.			
3822		27.	24.	24.	23.	22.	26.	24.	172.	190.	189.	196.	184.	181.			
3823		26.	25.	24.	23.	24.	26.	25.	179.	192.	191.	196.	196.	196.			
3824		32.	29.	30.	28.	29.	22.	40.	211.	219.	203.	214.	227.	223.			
3825		30.	28.	27.	24.	24.	28.	27.	233.	225.	219.	212.	216.	218.			
	DAYS	50 - 57	57 - 64	64 - 71	71 - 78	78 - 85	85 - 91										
3811		168.	185.	176.	159.	175.	149.										
3812		185.	199.	186.	184.	183.	150.										
3813		212.	213.	213.	211.	197.	183.										
3814		189.	192.	187.	185.	169.	160.										
3815		204.	193.	192.	185.	191.	158.										
3816		176.	183.	180.	152.	178.	152.										
3817		202.	209.	209.	186.	216.	186.										
3818		221.	218.	210.	195.	206.	176.										
3819		185.	183.	191.	165.	193.	a										
3820		204.	200.	197.	184.	189.	166.										
3821		213.	217.	205.	204.	211.	162.										
3822		186.	179.	184.	175.	164.	136.										
3823		198.	191.	192.	193.	190.	157.										
3824		227.	238.	235.	217.	215.	186.										
3825		216.	220.	222.	218.	223.	172.										

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAYS = DAYS OF STUDY

a. Rat 3819 was euthanized on Day 86 of study due to adverse clinical observations.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 57 (PAGE 4): FEED CONSUMPTION VALUES - INDIVIDUAL DATA - MALE RATS - CHOLINESTERASE SUBSET

RAT #	DOSAGE GROUP IV 5000 PPM														
DAYS	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7	7 - 8	8 - 15	15 - 22	22 - 29	29 - 36	36 - 43	43 - 50		
3761	26.	27.	28.	26.	24.	27.	28.	190.	192.	173.	190.	184.	190.		
3762	23.	30.	27.	26.	34.	28.	26.	197.	199.	177.	179.	173.	176.		
3763	21.	24.	26.	24.	20.	27.	25.	170.	175.	169.	169.	180.	178.		
3764	22.	27.	26.	24.	25.	27.	26.	173.	175.	170.	181.	176.	173.		
3765	19.	30.	28.	27.	28.	30.	29.	198.	212.	197.	201.	196.	200.		
3766	26.	27.	29.	27.	27.	30.	29.	191.	200.	178.	185.	192.	185.		
3767	22.	22.	26.	25.	24.	24.	26.	174.	179.	175.	172.	175.	174.		
3768	23.	28.	25.	27.	26.	25.	26.	185.	202.	232.	a	199.	204.		
3769	23.	26.	25.	23.	22.	24.	24.	170.	176.	178.	190.	185.	195.		
3770	24.	28.	30.	28.	25.	27.	28.	183.	190.	179.	190.	179.	171.		
3771	20.	26.	26.	26.	22.	22.	26.	169.	175.	169.	171.	171.	168.		
3772	25.	26.	27.	25.	25.	27.	26.	184.	194.	185.	185.	179.	181.		
3773	17.	24.	23.	22.	22.	26.	23.	169.	172.	162.	163.	155.	155.		
3774	23.	26.	27.	27.	25.	29.	26.	203.	211.	198.	207.	212.	211.		
3775	24.	29.	32.	30.	28.	29.	29.	195.	202.	204.	207.	201.	206.		
DAYS	50 - 57	57 - 64	64 - 71	71 - 78	78 - 85	85 - 91									
3761	181.	183.	181.	182.	177.	156.									
3762	181.	175.	183.	183.	184.	152.									
3763	175.	176.	165.	168.	163.	141.									
3764	169.	171.	164.	162.	163.	147.									
3765	203.	197.	194.	183.	178.	152.									
3766	172.	175.	175.	179.	171.	143.									
3767	171.	171.	158.	168.	159.	132.									
3768	205.	204.	193.	184.	200.	161.									
3769	204.	194.	189.	167.	207.	172.									
3770	168.	166.	169.	168.	173.	141.									
3771	171.	170.	173.	177.	174.	137.									
3772	185.	184.	176.	179.	176.	157.									
3773	157.	163.	151.	150.	152.	130.									
3774	209.	210.	199.	209.	203.	164.									
3775	203.	203.	195.	181.	192.	169.									

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAYS = DAYS OF STUDY

a. Spilled feed precluded the calculation of this value.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 57 (PAGE 5): FEED CONSUMPTION VALUES - INDIVIDUAL DATA - MALE RATS - CHOLINESTERASE SUBSET

RAT #	DOSAGE GROUP V															10000 PPM				
	DAYS	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7	7 - 8	8 - 15	15 - 22	22 - 29	29 - 36	36 - 43	43 - 50						
3711		14.	22.	21.	23.	22.	23.	22.	174.	176.	173.	169.	164.	168.						
3712		16.	24.	27.	26.	24.	25.	29.	182.	198.	174.	176.	171.	163.						
3713		14.	21.	21.	19.	20.	23.	22.	155.	165.	155.	152.	167.	143.						
3714		20.	22.	26.	29.	26.	31.	27.	202.	266.	202.	217.	201.	a						
3715		17.	23.	23.	24.	22.	26.	23.	175.	190.	183.	194.	209.	187.						
3716		20.	20.	27.	22.	26.	31.	30.	230.	211.	209.	217.	213.	208.						
3717		12.	24.	29.	27.	28.	29.	29.	198.	173.	162.	160.	170.	167.						
3718		18.	20.	22.	26.	26.	27.	28.	179.	188.	171.	180.	166.	168.						
3719		15.	19.	19.	22.	20.	22.	21.	150.	159.	163.	164.	150.	153.						
3720		10.	21.	25.	29.	23.	43.	29.	207.	188.	166.	177.	177.	180.						
3721		17.	25.	23.	25.	23.	23.	26.	172.	180.	184.	193.	184.	179.						
3722		9.	18.	19.	18.	23.	24.	27.	167.	165.	160.	163.	163.	157.						
3723		2.	17.	21.	26.	23.	25.	26.	168.	175.	159.	163.	164.	166.						
3724		18.	21.	25.	25.	23.	26.	25.	171.	172.	166.	174.	179.	174.						
3725		19.	22.	27.	27.	26.	28.	24.	166.	163.	167.	174.	172.	173.						
	DAYS	50 - 57	57 - 64	64 - 71	71 - 78	78 - 85	85 - 91													
3711		166.	166.	171.	179.	172.	151.													
3712		177.	174.	167.	165.	161.	139.													
3713		145.	148.	151.	143.	141.	122.													
3714		191.	181.	176.	169.	178.	153.													
3715		197.	198.	187.	190.	186.	165.													
3716		205.	208.	187.	204.	199.	163.													
3717		163.	165.	169.	164.	155.	139.													
3718		177.	174.	165.	173.	186.	152.													
3719		157.	158.	158.	153.	150.	126.													
3720		182.	181.	186.	177.	171.	149.													
3721		192.	193.	173.	183.	168.	156.													
3722		159.	160.	161.	161.	157.	130.													
3723		163.	162.	153.	150.	152.	134.													
3724		171.	176.	172.	182.	179.	144.													
3725		173.	166.	165.	172.	175.	143.													

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAYS = DAYS OF STUDY

a. Spilled feed precluded the calculation of this value.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 58 (PAGE 1): FEED CONSUMPTION VALUES - INDIVIDUAL DATA - FEMALE RATS - CHOLINESTERASE SUBSET

RAT #	DOSAGE GROUP I		0 (CARRIER CONTROL) PPM												
	DAYS	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7	7 - 8	8 - 15	15 - 22	22 - 29	29 - 36	36 - 43	43 - 50	
3911		20.	16.	13.	17.	19.	16.	16.	130.	134.	132.	134.	138.	140.	
3912		19.	17.	17.	19.	21.	18.	17.	131.	128.	122.	121.	134.	126.	
3913		20.	18.	19.	19.	18.	15.	18.	135.	135.	133.	145.	143.	139.	
3914		21.	21.	18.	17.	23.	18.	19.	146.	156.	151.	161.	159.	152.	
3915		21.	19.	14.	19.	22.	19.	19.	248.	150.	127.	167.	137.	122.	
3916		20.	17.	17.	19.	19.	16.	19.	127.	137.	133.	123.	123.	130.	
3917		17.	15.	12.	17.	17.	14.	14.	104.	100.	94.	99.	111.	99.	
3918		18.	22.	20.	20.	21.	17.	21.	138.	141.	131.	126.	122.	123.	
3919		18.	19.	17.	39.	32.	19.	17.	136.	134.	141.	152.	144.	a	
3920		16.	18.	7.	25.	17.	17.	23.	114.	116.	114.	118.	a	104.	
3921		20.	16.	16.	15.	22.	18.	19.	120.	113.	115.	126.	113.	127.	
3922		18.	18.	18.	15.	18.	17.	16.	136.	129.	120.	123.	116.	129.	
3923		18.	16.	11.	17.	17.	15.	13.	107.	110.	93.	109.	104.	94.	
3924		19.	18.	16.	19.	21.	17.	17.	130.	129.	115.	123.	128.	114.	
3925		18.	20.	16.	15.	17.	17.	18.	126.	130.	131.	137.	136.	128.	
	DAYS	50 - 57	57 - 64	64 - 71	71 - 78	78 - 85	85 - 91								
3911		129.	130.	124.	123.	124.	94.								
3912		114.	123.	122.	121.	114.	104.								
3913		123.	119.	120.	124.	120.	107.								
3914		147.	149.	151.	130.	132.	116.								
3915		115.	115.	126.	122.	121.	106.								
3916		121.	112.	111.	116.	108.	87.								
3917		87.	95.	100.	99.	91.	80.								
3918		122.	113.	104.	107.	111.	82.								
3919		150.	126.	116.	111.	128.	91.								
3920		120.	118.	98.	98.	103.	78.								
3921		110.	116.	112.	119.	275.	89.								
3922		124.	119.	123.	126.	117.	105.								
3923		100.	104.	91.	78.	90.	63.								
3924		115.	118.	117.	113.	84.	91.								
3925		125.	121.	118.	120.	120.	101.								

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAYS = DAYS OF STUDY

a. Spilled feed precluded the calculation of this value.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 58 (PAGE 2): FEED CONSUMPTION VALUES - INDIVIDUAL DATA - FEMALE RATS - CHOLINESTERASE SUBSET

RAT #	DOSAGE GROUP II														100 PPM				
	DAYS	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7	7 - 8	8 - 15	15 - 22	22 - 29	29 - 36	36 - 43	43 - 50					
3861		21.	19.	16.	15.	18.	19.	16.	116.	115.	110.	116.	114.	107.					
3862		16.	18.	15.	12.	18.	17.	17.	111.	121.	109.	121.	119.	123.					
3863		17.	15.	17.	18.	18.	13.	18.	118.	128.	119.	123.	114.	117.					
3864		27.	25.	24.	22.	19.	21.	23.	131.	135.	132.	126.	119.	118.					
3865		19.	18.	17.	16.	19.	19.	21.	131.	136.	146.	140.	126.	127.					
3866		21.	19.	17.	18.	21.	22.	22.	124.	130.	132.	132.	124.	120.					
3867		16.	15.	17.	19.	22.	13.	20.	117.	137.	159.	224.	157.	141.					
3868		19.	18.	16.	14.	20.	19.	16.	118.	123.	122.	128.	120.	111.					
3869		18.	17.	17.	16.	18.	17.	20.	115.	206.	113.	116.	113.	110.					
3870		20.	20.	20.	20.	20.	22.	23.	141.	136.	146.	147.	131.	134.					
3871		18.	17.	15.	15.	31.	16.	15.	100.	95.	95.	102.	96.	93.					
3872		18.	13.	15.	17.	16.	11.	19.	108.	108.	107.	111.	107.	102.					
3873		17.	16.	15.	13.	18.	14.	17.	113.	118.	115.	117.	108.	102.					
3874		18.	18.	16.	15.	20.	16.	18.	126.	129.	127.	135.	138.	121.					
3875		20.	20.	18.	16.	21.	19.	19.	135.	136.	141.	146.	127.	123.					
	DAYS	50 - 57	57 - 64	64 - 71	71 - 78	78 - 85	85 - 91												
3861		96.	101.	94.	91.	96.	82.												
3862		118.	126.	127.	115.	116.	108.												
3863		112.	108.	108.	115.	106.	88.												
3864		108.	112.	108.	106.	105.	87.												
3865		122.	124.	113.	107.	101.	92.												
3866		124.	125.	112.	119.	112.	97.												
3867		128.	129.	127.	125.	118.	94.												
3868		109.	113.	107.	108.	103.	89.												
3869		114.	112.	109.	109.	109.	87.												
3870		135.	129.	125.	134.	143.	107.												
3871		96.	98.	96.	93.	94.	76.												
3872		91.	89.	91.	100.	89.	77.												
3873		106.	103.	99.	103.	104.	86.												
3874		121.	128.	129.	135.	129.	107.												
3875		119.	119.	101.	110.	115.	100.												

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAYS = DAYS OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 58 (PAGE 3): FEED CONSUMPTION VALUES - INDIVIDUAL DATA - FEMALE RATS - CHOLINESTERASE SUBSET

RAT #	DOSAGE GROUP III														500 PPM				
	DAYS	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7	7 - 8	8 - 15	15 - 22	22 - 29	29 - 36	36 - 43	43 - 50					
3936		18.	18.	18.	18.	19.	15.	20.	134.	131.	132.	132.	126.	119.					
3937		21.	19.	19.	17.	20.	20.	22.	132.	133.	131.	135.	a	122.					
3938		17.	15.	18.	5.	27.	14.	19.	115.	116.	114.	120.	120.	115.					
3939		20.	18.	15.	15.	21.	15.	16.	122.	124.	122.	122.	121.	115.					
3940		18.	19.	19.	18.	29.	19.	23.	128.	a	150.	129.	130.	123.					
3941		14.	17.	16.	14.	14.	14.	17.	103.	108.	110.	110.	106.	105.					
3942		20.	19.	17.	17.	18.	17.	18.	137.	139.	133.	128.	132.	123.					
3943		17.	16.	13.	13.	19.	13.	12.	112.	116.	106.	120.	116.	133.					
3944		18.	18.	17.	17.	18.	18.	18.	123.	128.	125.	132.	126.	117.					
3945		17.	16.	13.	17.	17.	15.	15.	120.	117.	114.	119.	127.	116.					
3946		15.	15.	16.	17.	16.	16.	16.	132.	130.	116.	122.	119.	117.					
3947		21.	18.	16.	18.	21.	16.	20.	150.	a	143.	139.	138.	132.					
3948		15.	21.	18.	18.	16.	16.	a	134.	153.	159.	172.	178.	164.					
3949		20.	18.	18.	18.	19.	17.	18.	137.	139.	140.	140.	139.	132.					
3950		16.	18.	18.	15.	17.	15.	20.	111.	117.	119.	126.	118.	120.					
	DAYS	50 - 57	57 - 64	64 - 71	71 - 78	78 - 85	85 - 91												
3936		112.	105.	102.	107.	101.	87.												
3937		117.	132.	125.	105.	109.	110.												
3938		114.	111.	110.	105.	106.	89.												
3939		110.	118.	123.	120.	109.	99.												
3940		124.	113.	102.	112.	119.	88.												
3941		103.	100.	99.	102.	102.	84.												
3942		117.	116.	111.	112.	106.	95.												
3943		113.	120.	a	114.	121.	97.												
3944		113.	114.	110.	117.	123.	95.												
3945		112.	112.	114.	114.	118.	99.												
3946		113.	114.	104.	110.	111.	95.												
3947		124.	120.	122.	119.	117.	100.												
3948		166.	154.	153.	156.	148.	122.												
3949		120.	125.	131.	127.	92.	105.												
3950		113.	107.	113.	114.	123.	95.												

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAYS = DAYS OF STUDY

a. Spilled feed precluded the calculation of this value.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 58 (PAGE 4): FEED CONSUMPTION VALUES - INDIVIDUAL DATA - FEMALE RATS - CHOLINESTERASE SUBSET

RAT #	DOSAGE GROUP IV 5000 PPM														
DAYS	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7	7 - 8	8 - 15	15 - 22	22 - 29	29 - 36	36 - 43	43 - 50		
3961	19.	22.	21.	20.	22.	19.	21.	147.	142.	115.	133.	142.	133.		
3962	12.	20.	13.	17.	19.	18.	13.	119.	135.	120.	126.	130.	125.		
3963	12.	12.	15.	15.	16.	9.	16.	111.	116.	113.	118.	116.	119.		
3964	18.	19.	22.	18.	23.	25.	23.	138.	180.	133.	131.	132.	130.		
3965	15.	17.	15.	15.	18.	15.	15.	122.	a	113.	117.	110.	108.		
3966	14.	18.	18.	15.	20.	17.	18.	126.	130.	138.	133.	124.	112.		
3967	12.	17.	15.	13.	16.	13.	14.	97.	102.	99.	117.	97.	a		
3968	12.	19.	18.	15.	16.	17.	18.	113.	117.	111.	119.	112.	108.		
3969	15.	17.	16.	13.	18.	18.	17.	138.	152.	141.	142.	134.	118.		
3970	18.	19.	16.	20.	20.	18.	20.	149.	162.	170.	159.	146.	149.		
3971	14.	18.	14.	15.	17.	15.	16.	108.	111.	a	114.	112.	111.		
3972	15.	20.	18.	12.	19.	18.	18.	132.	135.	140.	146.	132.	124.		
3973	19.	18.	18.	18.	20.	20.	19.	131.	141.	130.	133.	124.	124.		
3974	17.	20.	16.	17.	15.	16.	14.	118.	126.	112.	119.	132.	112.		
3975	18.	18.	18.	15.	18.	19.	18.	120.	133.	118.	120.	113.	101.		
DAYS	50 - 57	57 - 64	64 - 71	71 - 78	78 - 85	85 - 91									
3961	133.	129.	123.	131.	130.	110.									
3962	121.	122.	122.	115.	115.	92.									
3963	110.	112.	109.	112.	107.	90.									
3964	122.	124.	125.	131.	125.	99.									
3965	100.	94.	98.	99.	98.	82.									
3966	106.	108.	108.	106.	105.	97.									
3967	90.	96.	89.	96.	93.	74.									
3968	111.	106.	108.	105.	97.	79.									
3969	116.	116.	114.	123.	112.	88.									
3970	153.	185.	159.	112.	109.	88.									
3971	112.	107.	100.	106.	110.	83.									
3972	136.	129.	137.	128.	132.	117.									
3973	122.	119.	116.	115.	112.	89.									
3974	107.	106.	110.	107.	101.	89.									
3975	105.	108.	102.	99.	101.	87.									

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAYS = DAYS OF STUDY

a. Spilled feed precluded the calculation of this value.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 58 (PAGE 5): FEED CONSUMPTION VALUES - INDIVIDUAL DATA - FEMALE RATS - CHOLINESTERASE SUBSET

RAT #	DOSAGE GROUP V 10000 PPM														
DAYS	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7	7 - 8	8 - 15	15 - 22	22 - 29	29 - 36	36 - 43	43 - 50		
3886	12.	19.	18.	17.	21.	18.	21.	127.	121.	153.	127.	118.	124.		
3887	12.	20.	17.	17.	18.	17.	16.	132.	a	126.	134.	133.	122.		
3888	13.	17.	16.	16.	14.	13.	16.	103.	120.	110.	120.	117.	116.		
3889	2.	14.	18.	16.	17.	17.	17.	123.	117.	116.	127.	116.	111.		
3890	11.	19.	18.	16.	19.	22.	20.	183.	114.	113.	115.	184.	103.		
3891	6.	14.	16.	15.	17.	12.	14.	106.	101.	102.	97.	102.	82.		
3892	10.	18.	18.	14.	15.	14.	18.	114.	117.	109.	109.	113.	112.		
3893	3.	15.	21.	17.	20.	14.	16.	124.	127.	115.	119.	113.	114.		
3894	1.	10.	18.	16.	21.	17.	16.	120.	a	135.	143.	148.	145.		
3895	14.	21.	19.	14.	17.	15.	21.	127.	140.	142.	148.	141.	147.		
3896	13.	15.	15.	18.	19.	16.	15.	119.	125.	120.	128.	122.	111.		
3897	11.	17.	17.	16.	16.	15.	15.	145.	a	108.	133.	114.	106.		
3898	6.	14.	17.	15.	17.	12.	18.	109.	112.	105.	108.	102.	103.		
3899	12.	18.	17.	18.	20.	16.	20.	137.	146.	125.	141.	132.	126.		
3900	11.	20.	19.	17.	20.	18.	20.	127.	132.	125.	121.	117.	110.		
DAYS	50 - 57	57 - 64	64 - 71	71 - 78	78 - 85	85 - 91									
3886	112.	118.	103.	110.	112.	93.									
3887	123.	a	122.	118.	122.	101.									
3888	105.	103.	107.	104.	101.	86.									
3889	115.	115.	102.	108.	103.	86.									
3890	104.	99.	93.	91.	95.	74.									
3891	97.	101.	94.	92.	93.	75.									
3892	99.	105.	92.	96.	102.	80.									
3893	109.	115.	115.	128.	122.	96.									
3894	141.	135.	139.	155.	133.	120.									
3895	a	178.	161.	143.	127.	107.									
3896	109.	107.	103.	101.	97.	88.									
3897	119.	102.	103.	105.	93.	79.									
3898	91.	91.	91.	94.	93.	81.									
3899	122.	129.	130.	127.	130.	102.									
3900	117.	103.	98.	105.	105.	82.									

ALL WEIGHTS WERE RECORDED IN GRAMS (G). DAYS = DAYS OF STUDY

a. Spilled feed precluded the calculation of this value.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 59 (PAGE 1): NECROPSY OBSERVATIONS - INDIVIDUAL DATA - MALE RATS - CHOLINESTERASE SUBSET

RAT NUMBER	DAY OF NECROPSY	DAYS OF EXPOSURE	OBSERVATIONS
DOSAGE GROUP I			0 (CARRIER CONTROL) PPM
3786	DS 91	90	ALL TISSUES APPEARED NORMAL.
3787	DS 91	90	ALL TISSUES APPEARED NORMAL.
3788	DS 91	90	ALL TISSUES APPEARED NORMAL.
3789	DS 91	90	ALL TISSUES APPEARED NORMAL.
3790	DS 91	90	ALL TISSUES APPEARED NORMAL.
3791	DS 91	90	ALL TISSUES APPEARED NORMAL.
3792	DS 91	90	ALL TISSUES APPEARED NORMAL.
3793	DS 91	90	ALL TISSUES APPEARED NORMAL.
3794	DS 91	90	ALL TISSUES APPEARED NORMAL.
3795	DS 91	90	ALL TISSUES APPEARED NORMAL.
3796	DS 91	90	ALL TISSUES APPEARED NORMAL.
3797	DS 91	90	ALL TISSUES APPEARED NORMAL.
3798	DS 91	90	ALL TISSUES APPEARED NORMAL.
3799	DS 91	90	ALL TISSUES APPEARED NORMAL.
3800	DS 91	90	ALL TISSUES APPEARED NORMAL.
DOSAGE GROUP II			100 PPM
3736	DS 91	90	ALL TISSUES APPEARED NORMAL.
3737	DS 91	90	ALL TISSUES APPEARED NORMAL.
3738	DS 91	90	ALL TISSUES APPEARED NORMAL.
3739	DS 91	90	ALL TISSUES APPEARED NORMAL.
3740	DS 91	90	ALL TISSUES APPEARED NORMAL.
3741	DS 91	90	ALL TISSUES APPEARED NORMAL.
3742	DS 91	90	ALL TISSUES APPEARED NORMAL.
3743	DS 91	90	ALL TISSUES APPEARED NORMAL.
3744	DS 91	90	ALL TISSUES APPEARED NORMAL.
3745	DS 91	90	KIDNEYS: RIGHT, PELVIS, SLIGHT DILATION. ALL OTHER TISSUES APPEARED NORMAL.
3746	DS 91	90	ALL TISSUES APPEARED NORMAL.
3747	DS 77	76	FOUND DEAD ON DAY 77 OF STUDY. ALL TISSUES APPEARED NORMAL FOR MODERATE DEGREE OF AUTOLYSIS.
3748	DS 91	90	ALL TISSUES APPEARED NORMAL.
3749	DS 91	90	KIDNEYS: RIGHT, PELVIS, SLIGHT DILATION. ALL OTHER TISSUES APPEARED NORMAL.
3750	DS 91	90	ALL TISSUES APPEARED NORMAL.

DAYS OF EXPOSURE WERE CALCULATED FROM DAY 1 OF STUDY (FIRST FEED VALUE RECORDED) THROUGH THE DAY BEFORE EUTHANASIA
DS = DAY OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 59 (PAGE 2): NECROPSY OBSERVATIONS - INDIVIDUAL DATA - MALE RATS - CHOLINESTERASE SUBSET

RAT NUMBER	DAY OF NECROPSY	DAYS OF EXPOSURE	OBSERVATIONS
DOSAGE GROUP III			500 PPM
3811	DS 91	90	ALL TISSUES APPEARED NORMAL.
3812	DS 91	90	ALL TISSUES APPEARED NORMAL.
3813	DS 91	90	ALL TISSUES APPEARED NORMAL.
3814	DS 91	90	ALL TISSUES APPEARED NORMAL.
3815	DS 91	90	ALL TISSUES APPEARED NORMAL.
3816	DS 91	90	ALL TISSUES APPEARED NORMAL.
3817	DS 91	90	ALL TISSUES APPEARED NORMAL.
3818	DS 91	90	ALL TISSUES APPEARED NORMAL.
3819	DS 86	86	UNSCHEDULED EUTHANASIA ON DAY 86 OF STUDY DUE TO ADVERSE CLINICAL OBSERVATIONS. ALL TISSUES APPEARED NORMAL.
3820	DS 91	90	ALL TISSUES APPEARED NORMAL.
3821	DS 91	90	ALL TISSUES APPEARED NORMAL.
3822	DS 91	90	ALL TISSUES APPEARED NORMAL.
3823	DS 91	90	ALL TISSUES APPEARED NORMAL.
3824	DS 91	90	ALL TISSUES APPEARED NORMAL.
3825	DS 91	90	KIDNEYS: RIGHT, PELVIS, SLIGHT DILATION. ALL OTHER TISSUES APPEARED NORMAL.
DOSAGE GROUP IV			5000 PPM
3761	DS 91	90	ALL TISSUES APPEARED NORMAL.
3762	DS 91	90	ALL TISSUES APPEARED NORMAL.
3763	DS 91	90	ALL TISSUES APPEARED NORMAL.
3764	DS 91	90	ALL TISSUES APPEARED NORMAL.
3765	DS 91	90	ALL TISSUES APPEARED NORMAL.
3766	DS 91	90	ALL TISSUES APPEARED NORMAL.
3767	DS 91	90	ALL TISSUES APPEARED NORMAL.
3768	DS 91	90	ALL TISSUES APPEARED NORMAL.
3769	DS 91	90	ALL TISSUES APPEARED NORMAL.
3770	DS 91	90	ALL TISSUES APPEARED NORMAL.
3771	DS 91	90	THYMUS: DARK RED. ALL OTHER TISSUES APPEARED NORMAL.
3772	DS 91	90	ALL TISSUES APPEARED NORMAL.
3773	DS 91	90	ALL TISSUES APPEARED NORMAL.
3774	DS 91	90	ALL TISSUES APPEARED NORMAL.
3775	DS 91	90	ALL TISSUES APPEARED NORMAL.

DAYS OF EXPOSURE WERE CALCULATED FROM DAY 1 OF STUDY (FIRST FEED VALUE RECORDED) THROUGH THE DAY BEFORE EUTHANASIA
DS = DAY OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 59 (PAGE 3): NECROPSY OBSERVATIONS - INDIVIDUAL DATA - MALE RATS - CHOLINESTERASE SUBSET

RAT NUMBER	DAY OF NECROPSY	DAYS OF EXPOSURE	OBSERVATIONS
DOSAGE GROUP V			10000 PPM
3711	DS 91	90	ALL TISSUES APPEARED NORMAL.
3712	DS 91	90	ALL TISSUES APPEARED NORMAL.
3713	DS 91	90	ALL TISSUES APPEARED NORMAL.
3714	DS 91	90	ALL TISSUES APPEARED NORMAL.
3715	DS 91	90	ALL TISSUES APPEARED NORMAL.
3716	DS 91	90	ALL TISSUES APPEARED NORMAL.
3717	DS 91	90	ALL TISSUES APPEARED NORMAL.
3718	DS 91	90	ALL TISSUES APPEARED NORMAL.
3719	DS 91	90	ALL TISSUES APPEARED NORMAL.
3720	DS 91	90	ALL TISSUES APPEARED NORMAL.
3721	DS 91	90	ALL TISSUES APPEARED NORMAL.
3722	DS 91	90	ALL TISSUES APPEARED NORMAL.
3723	DS 91	90	ALL TISSUES APPEARED NORMAL.
3724	DS 91	90	ALL TISSUES APPEARED NORMAL.
3725	DS 91	90	ALL TISSUES APPEARED NORMAL.

DAYS OF EXPOSURE WERE CALCULATED FROM DAY 1 OF STUDY (FIRST FEED VALUE RECORDED) THROUGH THE DAY BEFORE EUTHANASIA
DS = DAY OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 60 (PAGE 1): NECROPSY OBSERVATIONS - INDIVIDUAL DATA - FEMALE RATS - CHOLINESTERASE SUBSET

RAT NUMBER	DAY OF NECROPSY	DAYS OF EXPOSURE	OBSERVATIONS
DOSAGE GROUP I			0 (CARRIER CONTROL) PPM
3911	DS 91	90	ALL TISSUES APPEARED NORMAL.
3912	DS 91	90	ALL TISSUES APPEARED NORMAL.
3913	DS 91	90	ALL TISSUES APPEARED NORMAL.
3914	DS 91	90	ALL TISSUES APPEARED NORMAL.
3915	DS 91	90	ALL TISSUES APPEARED NORMAL.
3916	DS 91	90	ALL TISSUES APPEARED NORMAL.
3917	DS 91	90	ALL TISSUES APPEARED NORMAL.
3918	DS 91	90	ALL TISSUES APPEARED NORMAL.
3919	DS 91	90	ALL TISSUES APPEARED NORMAL.
3920	DS 91	90	ALL TISSUES APPEARED NORMAL.
3921	DS 91	90	ALL TISSUES APPEARED NORMAL.
3922	DS 91	90	ALL TISSUES APPEARED NORMAL.
3923	DS 91	90	ALL TISSUES APPEARED NORMAL.
3924	DS 91	90	ALL TISSUES APPEARED NORMAL.
3925	DS 91	90	ALL TISSUES APPEARED NORMAL.
DOSAGE GROUP II			100 PPM
3861	DS 91	90	ALL TISSUES APPEARED NORMAL.
3862	DS 91	90	ALL TISSUES APPEARED NORMAL.
3863	DS 91	90	ALL TISSUES APPEARED NORMAL.
3864	DS 91	90	ALL TISSUES APPEARED NORMAL.
3865	DS 91	90	ALL TISSUES APPEARED NORMAL.
3866	DS 91	90	ALL TISSUES APPEARED NORMAL.
3867	DS 91	90	ALL TISSUES APPEARED NORMAL.
3868	DS 91	90	ALL TISSUES APPEARED NORMAL.
3869	DS 91	90	ALL TISSUES APPEARED NORMAL.
3870	DS 91	90	ALL TISSUES APPEARED NORMAL.
3871	DS 91	90	ALL TISSUES APPEARED NORMAL.
3872	DS 91	90	ALL TISSUES APPEARED NORMAL.
3873	DS 91	90	ALL TISSUES APPEARED NORMAL.
3874	DS 91	90	ALL TISSUES APPEARED NORMAL.
3875	DS 91	90	ALL TISSUES APPEARED NORMAL.

DAYS OF EXPOSURE WERE CALCULATED FROM DAY 1 OF STUDY (FIRST FEED VALUE RECORDED) THROUGH THE DAY BEFORE EUTHANASIA
DS = DAY OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 60 (PAGE 2): NECROPSY OBSERVATIONS - INDIVIDUAL DATA - FEMALE RATS - CHOLINESTERASE SUBSET

RAT NUMBER	DAY OF NECROPSY	DAYS OF EXPOSURE	OBSERVATIONS
DOSAGE GROUP III			500 PPM
3936	DS 91	90	ALL TISSUES APPEARED NORMAL.
3937	DS 91	90	ALL TISSUES APPEARED NORMAL.
3938	DS 91	90	ALL TISSUES APPEARED NORMAL.
3939	DS 91	90	ALL TISSUES APPEARED NORMAL.
3940	DS 91	90	ALL TISSUES APPEARED NORMAL.
3941	DS 91	90	ALL TISSUES APPEARED NORMAL.
3942	DS 91	90	ALL TISSUES APPEARED NORMAL.
3943	DS 91	90	ALL TISSUES APPEARED NORMAL.
3944	DS 91	90	ALL TISSUES APPEARED NORMAL.
3945	DS 91	90	ALL TISSUES APPEARED NORMAL.
3946	DS 91	90	ALL TISSUES APPEARED NORMAL.
3947	DS 91	90	ALL TISSUES APPEARED NORMAL.
3948	DS 91	90	ALL TISSUES APPEARED NORMAL.
3949	DS 91	90	ALL TISSUES APPEARED NORMAL.
3950	DS 91	90	ALL TISSUES APPEARED NORMAL.
DOSAGE GROUP IV			5000 PPM
3961	DS 91	90a	ALL TISSUES APPEARED NORMAL.
3962	DS 91	90	ALL TISSUES APPEARED NORMAL.
3963	DS 91	90	ALL TISSUES APPEARED NORMAL.
3964	DS 91	90	ALL TISSUES APPEARED NORMAL.
3965	DS 91	90	ALL TISSUES APPEARED NORMAL.
3966	DS 91	90	ALL TISSUES APPEARED NORMAL.
3967	DS 91	90	ALL TISSUES APPEARED NORMAL.
3968	DS 91	90	ALL TISSUES APPEARED NORMAL.
3969	DS 91	90	ALL TISSUES APPEARED NORMAL.
3970	DS 91	90	ALL TISSUES APPEARED NORMAL.
3971	DS 91	90	ALL TISSUES APPEARED NORMAL.
3972	DS 91	90	ALL TISSUES APPEARED NORMAL.
3973	DS 91	90	ALL TISSUES APPEARED NORMAL.
3974	DS 91	90	ALL TISSUES APPEARED NORMAL.
3975	DS 91	90	ALL TISSUES APPEARED NORMAL.

DAYS OF EXPOSURE WERE CALCULATED FROM DAY 1 OF STUDY (FIRST FEED VALUE RECORDED) THROUGH THE DAY BEFORE EUTHANASIA

DS = DAY OF STUDY

a. The feed jar provided to rat 3961 on Day 29 of study was incorrectly labeled. This rat is presumed to have been provided the correct feed.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 60 (PAGE 3): NECROPSY OBSERVATIONS - INDIVIDUAL DATA - FEMALE RATS - CHOLINESTERASE SUBSET

RAT NUMBER	DAY OF NECROPSY	DAYS OF EXPOSURE	OBSERVATIONS
DOSAGE GROUP V			10000 PPM
3886	DS 91	90	ALL TISSUES APPEARED NORMAL.
3887	DS 91	90	ALL TISSUES APPEARED NORMAL.
3888	DS 91	90	ALL TISSUES APPEARED NORMAL.
3889	DS 91	90	ALL TISSUES APPEARED NORMAL.
3890	DS 91	90	ALL TISSUES APPEARED NORMAL.
3891	DS 91	90	ALL TISSUES APPEARED NORMAL.
3892	DS 91	90	ALL TISSUES APPEARED NORMAL.
3893	DS 91	90	ALL TISSUES APPEARED NORMAL.
3894	DS 91	90	ALL TISSUES APPEARED NORMAL.
3895	DS 91	90	ALL TISSUES APPEARED NORMAL.
3896	DS 91	90	ALL TISSUES APPEARED NORMAL.
3897	DS 91	90	ALL TISSUES APPEARED NORMAL.
3898	DS 91	90	ALL TISSUES APPEARED NORMAL.
3899	DS 91	90	ALL TISSUES APPEARED NORMAL.
3900	DS 91	90	ALL TISSUES APPEARED NORMAL.
DAYS OF EXPOSURE WERE CALCULATED FROM DAY 1 OF STUDY (FIRST FEED VALUE RECORDED) THROUGH THE DAY BEFORE EUTHANASIA			
DS = DAY OF STUDY			

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 61 (PAGE 1): BRAIN CHOLINESTERASE LEVELS - INDIVIDUAL DATA - MALE RATS

DOSAGE GROUP I		0 (CARRIER CONTROL) PPM	
RAT #	BRAIN (G)	FINAL CHOLINESTERASE (UNITS/G)	FOOTNOTE
3786	1.840	15.861	
3787	2.201	15.145	
3788	2.043	13.324	
3789	2.059	14.174	
3790a	1.411	20.732b	
		20.790c	
3791	1.834	15.362	
3792	2.088	13.810	
3793	2.051	16.030	
3794	2.074	15.540	
3795	2.025	14.413	
3796	2.116	13.764	
3797	2.181	13.932	
3798	2.066	14.722	
3799	2.086	13.646	
3800	2.076	14.301	

a. Rat 3790 had a questionable brain weight; brain weight and final cholinesterase values were excluded from summarization and statistical analyses.

b. Initial value appeared questionable; second or repeat analysis performed.

c. Second analysis performed; value confirmed initial analysis and was excluded from summarization and statistical analyses.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 61 (PAGE 2): BRAIN CHOLINESTERASE LEVELS - INDIVIDUAL DATA - MALE RATS

DOSAGE GROUP II		100 PPM	
RAT #	BRAIN (G)	FINAL CHOLINESTERASE (UNITS/G)	FOOTNOTE
3736	1.982	16.240	
3737	1.974	15.764	
3738	1.967	14.666	
3739	1.930	15.656	
3740	2.224	14.451	
3741	2.025	13.497	
3742	2.090	15.261	
3743	1.996	14.716	
3744	1.940	15.653	
3745	2.196	14.253	
3746	2.103	14.579	
3747	FOUND DEAD ON DAY 77 OF STUDY		
3748	2.093	14.332	
3749	1.961	14.465	
3750	1.759	15.944	

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 61 (PAGE 3): BRAIN CHOLINESTERASE LEVELS - INDIVIDUAL DATA - MALE RATS

DOSAGE GROUP III		500 PPM	
RAT #	BRAIN (G)	FINAL CHOLINESTERASE (UNITS/G)	FOOTNOTE
3811	2.006	14.685	
3812	2.043	15.187	
3813	1.942	15.304	
3814	2.004	14.504	
3815	2.024	14.913	
3816	2.172	14.454	
3817	1.968	14.972	
3818	1.951	14.163	
3819	UNSCHEDULE EUTHANASIA ON DAY 86 OF STUDY DUE TO ADVERSE CLINICAL OBSERVATIONS		
3820	2.162	13.809	
3821	1.976	14.477	
3822	2.065	15.046	
3823	2.146	13.688	
3824	2.092	13.971	
3825	1.996	13.894	

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 61 (PAGE 4): BRAIN CHOLINESTERASE LEVELS - INDIVIDUAL DATA - MALE RATS

DOSAGE GROUP IV		5000 PPM	
RAT #	BRAIN (G)	FINAL CHOLINESTERASE (UNITS/G)	FOOTNOTE
3761	1.759	12.315	
3762	1.998	12.407	
3763	1.916	13.119	
3764	2.010	11.860	
3765	2.180	11.134	
3766	1.889	12.152	
3767	2.029	12.130	
3768	2.114	10.817	
3769	2.055	12.101	
3770a	1.403	17.068b	
		19.592c	
3771	1.822	12.798	
3772	2.103	11.208	
3773	2.005	12.467	
3774	2.098	11.944	
3775	1.976	12.236	

a. Rat 3770 had a questionable brain weight; brain weight and final cholinesterase values were excluded from summarization and statistical analyses.

b. Initial value appeared questionable; repeat analysis performed.

c. Second analysis performed; value confirmed initial analysis and was excluded from summarization and statistical analyses.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 61 (PAGE 5): BRAIN CHOLINESTERASE LEVELS - INDIVIDUAL DATA - MALE RATS

DOSAGE GROUP V		10000 PPM	
RAT #	BRAIN (G)	FINAL CHOLINESTERASE (UNITS/G)	FOOTNOTE
3711	2.115	17.897a	
		12.020b	
		12.593c	
3712	1.889	14.028	
3713	2.188	11.514	
3714	1.990	10.279	
3715	1.884	12.261	
3716	1.919	11.000	
3717	1.783	11.775	
3718	1.986	10.691	
3719	1.891	12.168	
3720	2.002	12.941	
3721	2.031	11.925	
3722	1.722	13.469	
3723	1.861	12.414	
3724	1.988	11.551	
3725	2.071	10.999	

- a. Initial value appeared questionable and was excluded from summarization and statistical analyses; repeat analysis performed.
- b. Second analysis performed; value did not confirm initial analysis. Second analysis was confirmed by third analysis and was included in summarization and statistical analyses.
- c. Third analysis performed; value confirmed second analysis and was excluded from summarization and statistical analyses.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 62 (PAGE 1): BRAIN CHOLINESTERASE LEVELS - INDIVIDUAL DATA - FEMALE RATS

DOSAGE GROUP I		0 (CARRIER CONTROL) PPM	
RAT #	BRAIN (G)	FINAL CHOLINESTERASE (UNITS/G)	FOOTNOTE
3911	2.020	15.341	
3912	1.832	14.526	
3913	1.887	13.791	
3914	2.038	14.439	
3915	1.934	14.185	
3916	1.880	13.881	
3917	1.894	14.665	
3918	2.046	15.161	
3919	1.870	15.273	
3920	1.975	13.062	
3921	1.925	14.848	
3922	1.859	15.041	
3923	1.837	15.799	
3924	2.011	14.785	
3925	2.024	13.309	

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 62 (PAGE 2): BRAIN CHOLINESTERASE LEVELS - INDIVIDUAL DATA - FEMALE RATS

DOSAGE GROUP II		100 PPM	
RAT #	BRAIN (G)	FINAL CHOLINESTERASE (UNITS/G)	FOOTNOTE
3861	1.893	15.480	
3862	1.926	15.046	
3863	1.751	15.104	
3864	1.946	14.327	
3865	1.886	15.885	
3866	1.922	14.244	
3867	1.913	14.770	
3868	1.921	14.760	
3869	1.927	13.869	
3870	1.809	15.125	
3871	1.934	15.279	
3872	2.024	14.104	
3873	1.916	15.620	
3874	2.073	15.006	
3875	1.938	14.772	

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 62 (PAGE 3): BRAIN CHOLINESTERASE LEVELS - INDIVIDUAL DATA - FEMALE RATS

DOSAGE GROUP III		500 PPM	
RAT #	BRAIN (G)	FINAL CHOLINESTERASE (UNITS/G)	FOOTNOTE
3936	1.844	13.797	
3937	1.853	15.460	
3938	1.910	15.676	
3939	1.950	15.156	
3940	1.745	14.523	
3941	1.969	14.182	
3942	1.812	14.012	
3943	2.132	12.204	
3944	1.968	14.181	
3945	1.896	X	DNR
		14.092	
3946	1.874	13.811	
3947	1.798	14.284	
3948	1.948	13.627	
3949	1.930	13.934	
3950	1.895	14.117	

X = SAMPLE RESULTS DID NOT MEET ACCEPTABILITY CRITERIA

DNR = DUPLICATE ANALYSIS OF THE SAME SAMPLE DOES NOT MEET REPRODUCIBILITY CRITERIA.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 62 (PAGE 4): BRAIN CHOLINESTERASE LEVELS - INDIVIDUAL DATA - FEMALE RATS

DOSAGE GROUP IV		5000 PPM	
RAT #	BRAIN (G)	FINAL CHOLINESTERASE (UNITS/G)	FOOTNOTE
3961	1.962	11.036	
3962	1.760	13.598	
3963	1.816	11.379	
3964	1.988	10.777	
3965	1.772	12.663	
3966	1.836	11.874	
3967	1.814	10.839	
3968	1.998	10.384	
3969	1.888	10.621	
3970	1.970	10.315	
3971	1.808	12.005	
3972	1.882	11.148	
3973	1.911	11.347	
3974	1.924	11.222	
3975	1.785	11.525	

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 62 (PAGE 5): BRAIN CHOLINESTERASE LEVELS - INDIVIDUAL DATA - FEMALE RATS

DOSAGE GROUP V		10000 PPM	
RAT #	BRAIN (G)	FINAL CHOLINESTERASE (UNITS/G)	FOOTNOTE
3886	1.949	7.612	
3887	1.900	5.310	
3888	1.874	6.575	
3889	1.996	5.258	
3890	1.924	6.860	
3891	2.003	9.386	
3892	1.879	5.025	
3893	2.014	5.092	
3894	1.989	5.820	
3895	1.954	6.909	
3896	1.841	9.437	
3897	1.938	9.951	
3898	1.933	8.803	
3899	1.872	9.201	
3900	1.813	8.883	

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 63 (PAGE 1): RBC CHOLINESTERASE LEVELS - INDIVIDUAL DATA - MALE RATS

DOSAGE GROUP I		0 (CARRIER CONTROL) PPM
RAT #	FINAL CHOLINESTERASE (UNITS/ML)	FOOTNOTE
3786	1.574	
3787	1.983	
3788	1.934	
3789	2.003	
3790	1.695	
3791	1.758	
3792	1.779	
3793	1.886	
3794	1.672	
3795	1.761	
3796a		
3797	1.815	
3798	1.348	
3799	1.696	
3800	1.686	

a. RBC sample was not analyzed.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 63 (PAGE 2): RBC CHOLINESTERASE LEVELS - INDIVIDUAL DATA - MALE RATS

DOSAGE GROUP II		100 PPM	
RAT #	FINAL CHOLINESTERASE (UNITS/ML)		FOOTNOTE
3736	1.730		
3737	1.421		
3738	1.501		
3739	1.953		
3740	1.733		
3741	1.445		
3742	1.772		
3743	1.774		
3744	1.727		
3745	1.284		
3746a			
3747	FOUND DEAD ON DAY 77 OF STUDY		
3748	1.319		
3749	1.917		
3750	1.559		

a. RBC sample was not analyzed.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 63 (PAGE 3): RBC CHOLINESTERASE LEVELS - INDIVIDUAL DATA - MALE RATS

DOSAGE GROUP III		500 PPM	
RAT #	FINAL CHOLINESTERASE (UNITS/ML)		FOOTNOTE
3811	1.394		
3812	1.044		
3813	1.566		
3814	1.511		
3815	1.477		
3816	1.429		
3817	2.122		
3818	1.653		
3819	UNSCHEDULED EUTHANASIA ON DAY 86 OF STUDY DUE TO ADVERSE CLINICAL OBSERVATIONS		
3820	1.360		
3821a			
3822b	1.635		
3823	1.619		
3824	1.126		
3825	1.324		

a. RBC sample was not analyzed.

b. Sample was improperly labeled; value was excluded from summarization and statistical analyses.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 63 (PAGE 4): RBC CHOLINESTERASE LEVELS - INDIVIDUAL DATA - MALE RATS

DOSAGE GROUP IV	5000 PPM	
RAT #	FINAL CHOLINESTERASE (UNITS/ML)	FOOTNOTE
3761	X	DNR
	0.158a	LOW
	X	DNR
3762	0.254	LOW
	0.186	LOW
	0.374	
3763	0.482	
3764	0.355	
3765	0.491	
3766	X	DNR
	0.704	
3767	0.674	
3768	X	DNR
	0.566	
3769	X	DNR
	X	DNR
	0.352	
3770	0.322	
3771b		
3772	0.829	
3773	X	DNR
	0.388	
3774	0.703	
3775	0.262	

X = SAMPLE RESULTS DID NOT MEET ACCEPTABILITY CRITERIA

LOW = REPORTED VALUE IS BELOW THE LOWEST STANDARD (VALUES WERE EXTRAPOLATED); VALUE WAS EXCLUDED FROM SUMMARIZATION AND STATISTICAL ANALYSES

DNR = DUPLICATE ANALYSIS OF THE SAME SAMPLE DOES NOT MEET REPRODUCIBILITY CRITERIA.

a. Extrapolated value was included in summarization and statistical analyses.

b. RBC sample was not analyzed.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 63 (PAGE 5): RBC CHOLINESTERASE LEVELS - INDIVIDUAL DATA - MALE RATS

DOSAGE GROUP V		10000 PPM	
RAT #	FINAL CHOLINESTERASE (UNITS/ML)		FOOTNOTE
3711	X		DNR
	X		DNR
	X		DNR
3712	0.181a		LOW
	X		DNR
	0.150		LOW
3713	0.231		
3714	X		DNR
	X		DNR
	X		DNR
3715	X		DNR
	0.382		
	X		DNR
3716	X		DNR
	X		DNR
	X		DNR
3717	0.471		
3718	X		DNR
	X		DNR
	0.215a		LOW
3719b			
3720	X		DNR
	0.256		
3721b			
3722c	0.213		LOW
	X		DNR
	0.252		LOW
3723	0.190a		LOW
	X		DNR
	X		DNR

X = SAMPLE RESULTS DID NOT MEET ACCEPTABILITY CRITERIA

LOW = REPORTED VALUE IS BELOW THE LOWEST STANDARD (VALUES WERE EXTRAPOLATED); VALUE WAS EXCLUDED FROM SUMMARIZATION AND STATISTICAL ANALYSES

DNR = DUPLICATE ANALYSIS OF THE SAME SAMPLE DOES NOT MEET REPRODUCIBILITY CRITERIA.

a. Extrapolated value was included in summarization and statistical analyses.

b. RBC sample was not analyzed.

c. Sample was improperly labeled; value was excluded from summarization and statistical analyses.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 63 (PAGE 6): RBC CHOLINESTERASE LEVELS - INDIVIDUAL DATA - MALE RATS

DOSAGE GROUP V		10000 PPM	
RAT #	FINAL CHOLINESTERASE (UNITS/ML)		FOOTNOTE
3724a	0.214b		LOW
	0.220		LOW
3725a	0.155b		LOW
	0.191		LOW

X = SAMPLE RESULTS DID NOT MEET ACCEPTABILITY CRITERIA

LOW = REPORTED VALUE IS BELOW THE LOWEST STANDARD (VALUES WERE EXTRAPOLATED); VALUE WAS EXCLUDED FROM SUMMARIZATION AND

STATISTICAL ANALYSES

DNR = DUPLICATE ANALYSIS OF THE SAME SAMPLE DOES NOT MEET REPRODUCIBILITY CRITERIA.

a. An additional analysis was inadvertently not performed.

b. Extrapolated value was included in summarization and statistical analyses.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 64 (PAGE 1): RBC CHOLINESTERASE LEVELS - INDIVIDUAL DATA - FEMALE RATS

DOSAGE GROUP I		0 (CARRIER CONTROL) PPM
RAT #	FINAL CHOLINESTERASE (UNITS/ML)	FOOTNOTE
3911	1.916	
3912	1.413	
3913	1.586	
3914	1.611	
3915	1.910	
3916	1.722	
3917	1.897	
3918	1.746	
3919	1.597	
3920	1.621	
3921	1.652	
3922	1.643	
3923	1.788	
3924	1.824	
3925	1.574	

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 64 (PAGE 2): RBC CHOLINESTERASE LEVELS - INDIVIDUAL DATA - FEMALE RATS

DOSAGE GROUP II		100 PPM	
RAT #	FINAL CHOLINESTERASE (UNITS/ML)		FOOTNOTE
3861	1.377		
3862	1.238		
3863	1.663		
3864	1.698		
3865	1.555		
3866	1.406		
3867	1.260		
3868	1.667		
3869	1.453		
3870	1.612		
3871	1.664		
3872	1.758		
3873	1.454		
3874	1.668		
3875	1.430		

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 64 (PAGE 3): RBC CHOLINESTERASE LEVELS - INDIVIDUAL DATA - FEMALE RATS

DOSAGE GROUP III		500 PPM	
RAT #	FINAL CHOLINESTERASE (UNITS/ML)		FOOTNOTE
3936	1.095		
3937	1.606		
3938	1.507		
3939	1.080		
3940	1.308		
3941	1.371		
3942	0.998		
3943	1.425		
3944	1.275		
3945	1.236		
3946	1.015		
3947	1.985		
3948	1.894		
3949	1.276		
3950	1.438		

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 64 (PAGE 4): RBC CHOLINESTERASE LEVELS - INDIVIDUAL DATA - FEMALE RATS

DOSAGE GROUP IV	5000 PPM	
RAT #	FINAL CHOLINESTERASE (UNITS/ML)	FOOTNOTE
3961	X	DNR
	X	DNR
	0.288	
3962	0.238	LOW
	0.312	
3963	0.458	
3964	0.515	
3965	0.350	
3966	0.306	
3967	X	DNR
	0.373	
3968	0.263	
3969	0.187a	LOW
	0.182	LOW
	0.204	LOW
3970	0.594	
3971	0.367	
3972	X	DNR
	1.850b	
3973	0.412	
3974	0.216	LOW
	0.220	LOW
	0.265	
3975	X	DNR
	0.252	
	X	DNR

X = SAMPLE RESULTS DID NOT MEET ACCEPTABILITY CRITERIA

LOW = REPORTED VALUE IS BELOW THE LOWEST STANDARD (VALUES WERE EXTRAPOLATED); VALUE WAS EXCLUDED FROM SUMMARIZATION AND STATISTICAL ANALYSES

DNR = DUPLICATE ANALYSIS OF THE SAME SAMPLE DOES NOT MEET REPRODUCIBILITY CRITERIA.

- a. Extrapolated value was included in summarization and statistical analyses.
- b. Value was questionable and was excluded from summarization and statistical analyses.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 64 (PAGE 5): RBC CHOLINESTERASE LEVELS - INDIVIDUAL DATA - FEMALE RATS

DOSAGE GROUP V	10000 PPM	FOOTNOTE
RAT #		
3886	X	DNR
	0.187a	LOW
	X	DNR
3887	X	DNR
	0.019a	LOW
	X	DNR
3888	0.233	LOW
	X	DNR
	0.285	
3889	X	DNR
	X	DNR
	X	DNR
3890	0.184a	LOW
	X	DNR
	X	DNR
3891	X	DNR
	0.233a	LOW
	0.164	LOW
3892	0.228a	LOW
	X	DNR
	X	DNR
3893	X	DNR
	X	DNR
	X	DNR
3894	0.670	
	0.660b	
3895	0.210a	LOW
	X	DNR
	0.219	LOW
3896	0.277	
3897	X	DNR
	0.248	

X = SAMPLE RESULTS DID NOT MEET ACCEPTABILITY CRITERIA

LOW = REPORTED VALUE IS BELOW THE LOWEST STANDARD (VALUES WERE EXTRAPOLATED); VALUE WAS EXCLUDED FROM SUMMARIZATION AND STATISTICAL ANALYSES

DNR = DUPLICATE ANALYSIS OF THE SAME SAMPLE DOES NOT MEET REPRODUCIBILITY CRITERIA.

a. Extrapolated value was included in summarization and statistical analyses.

b. Second analysis performed; value confirmed initial analysis and was excluded from summarization and statistical analyses.

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 64 (PAGE 6): RBC CHOLINESTERASE LEVELS - INDIVIDUAL DATA - FEMALE RATS

DOSAGE GROUP V		10000 PPM	
RAT #			FOOTNOTE
3898	0.191a		LOW
	X		DNR
	X		DNR
3899	0.278		
3900	X		DNR
	0.168a		LOW
	X		DNR

X = SAMPLE RESULTS DID NOT MEET ACCEPTABILITY CRITERIA

LOW = REPORTED VALUE IS BELOW THE LOWEST STANDARD (VALUES WERE EXTRAPOLATED); VALUE WAS EXCLUDED FROM SUMMARIZATION AND STATISTICAL ANALYSES

DNR = DUPLICATE ANALYSIS OF THE SAME SAMPLE DOES NOT MEET REPRODUCIBILITY CRITERIA.

a. Extrapolated value was included in summarization and statistical analyses.

APPENDIX 1 - PROTOCOL AND PROTOCOL AMENDMENTS



FINAL PROTOCOL

Charles River Laboratories Study No. TQC00066

**Oral (Diet) Repeated Dose 90-Day Toxicity Study of Malathion
Technical in Rats**

SPONSOR:

Cheminova A/S
P.O. Box 9
DK-7620 Lemvig
DENMARK

PERFORMING LABORATORY:

Charles River Laboratories
Preclinical Services
905 Sheehy Drive, Building A
Horsham, PA 19044
USA

11 January 2011

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1. STUDY NUMBER

TQC00066

2. STUDY TITLE

Oral (Diet) Repeated Dose 90-Day Toxicity Study of Malathion in Rats

3. PURPOSE

The purpose of this study is to provide information on possible adverse effects on Crl:CD(SD) rats resulting from repeated exposure to Malathion over an extended period of time covering postweaning maturation and growth well into adulthood. The study should provide information on toxicity, indicate target organs and the possibility of accumulation, and may provide an estimate of a no-observed-adverse-effect level (NOAEL) of exposure that can be used for establishing safety criteria for human exposure.

4. TESTING FACILITY

Charles River Laboratories
Preclinical Services
905 Sheehy Drive, Building A
Horsham, PA 19044
USA
Main Tel: 215.443.8710
Fax: 215.443.8587

5. STUDY DIRECTOR

John F. Barnett, Jr., B.S. (Senior Research Scientist)
Address as cited above for Testing Facility.
Direct Tel: 267.532.3750
E-mail: john.barnettjr@crl.com

6. SPONSOR

Cheminova A/S
P.O. Box 9
DK-7620 Lemvig
DENMARK

7. STUDY MONITOR

M. Jensen

8. REGULATORY COMPLIANCE

The requirements of the Organisation for Economic Co-operation and Development¹ and the U.S. Environmental Protection Agency (EPA)² will be used as the basis for study design.

This study will be conducted in compliance with the Good Laboratory Practice (GLP) regulations of the U.S. Environmental Protection Agency³ and the Organisation for Economic Co-operation and Development⁴. The ophthalmological evaluations will be performed only under U.S. EPA GLP.

All changes or revisions of this protocol shall be documented, approved by the Institutional Animal Care and Use Committee, approved and signed by the Study Director and Sponsor, dated and maintained with the protocol.

The Testing Facility's Quality Assurance Unit (QAU) will audit the protocol, the raw data and the report, and will inspect critical phases of those portions of the study conducted at the Testing Facility in accordance with the Standard Operating Procedures of the Testing Facility.

The final report will include a compliance statement signed by the Study Director that the report accurately reflects the raw data obtained during the performance of the study and that all applicable GLP regulations were followed in the conduct of the study. Should deviations from GLP regulations occur, each will be described in detail, together with how the deviation might affect the quality or integrity of the study.

Should any portion of the study be conducted by a subcontractor or by the Sponsor, the Testing Facility management will ensure that a qualified Principal Investigator is identified by the site conducting that portion of the study. All procedures conducted by

the Test Site will be specifically defined by the protocol, or will be described in detail in the Standard Operating Procedures of the Test Site. The QAU for this facility site will conduct critical phase inspections and audit respective results and reports for that study portion according to the SOPs of that site. Such critical phase inspection reports and report audits will be submitted by the site to the Principal Investigator and the Study Director. The dates of the inspections and report submissions will be incorporated into a QAU Statement generated by that site and provided to the Testing Facility for inclusion in the final report. In addition, this site will provide a statement of GLP compliance, as described above, signed by the Principal Investigator for inclusion in the final report. The archival location of any records generated by this site will be identified in the final report.

The Study Director will notify the Study Monitor of any possible adverse effects as required by law under FIFRA Section 6(a)(2) within 24 hours of obtaining such information.

9. SCHEMATIC OF STUDY DESIGN AND PROPOSED STUDY SCHEDULE

See Attachment 1 to the protocol.

10. TEST SUBSTANCE AND CARRIER

10.1. Identification

10.1.1. Test Substance

Malathion Technical (CHA 300)

Batch Number:	D2014-OSJ-MLT-01-S
Expiration Date:	28 September 2013
Appearance:	Light, yellow liquid
Purity:	95.8% w/w

Documentation or certification of the identity, composition, strength and activity/purity of the test substance is on file at the Testing Facility. This documentation will be included in the final report. The test substance is a marketed product and therefore the method of synthesis information has been documented.

The Study Director is not aware of any potential contaminants likely to be present in the test substance that would interfere with the results of this study. Therefore, no additional analyses are being conducted. A Certificate of Analysis is available in Attachment 2.

10.1.2. Carrier

The carrier will be the meal form of Certified Rodent Diet[®] #5002 (PMI[®] Nutrition International) containing 5% corn oil as a dust reducing agent. Results of feed analyses will be included in the raw data.

The Study Director is not aware of any potential contaminants likely to be present in the carrier that would interfere with the results of this study. Therefore, no analyses other than those mentioned in this protocol will be conducted.

10.2. Safety Precautions

Double nitrile gloves, full faced positive pressure hood, appropriate eye protection and Tyvek[®] suit will be worn during formulation preparation and dosage administration. Bulk test substance will be handled in a chemical fume hood. Gloves will be washed with soap and water or sprayed with an appropriate cleaning solution prior to removal and then disposed of in a biohazard container. For all other activities, standard safety precautions will be followed. The Material Safety Data Sheet (MSDS) will be maintained in the raw data.

10.3. Storage

Bulk Test Substance:	Refrigerated (2°C to 8°C) and protected from light.
Carrier:	Room Temperature.
Prepared Diets:	Refrigerated (2°C to 8°C) until use.
Corn Oil:	Room Temperature.

All test article shipments should be addressed to the attention of **Julian Gulbinski, (julian.gulbinski@crl.com)**, Senior Manager Laboratory Sciences, at the previously cited Testing Facility address and telephone number.

Shipments should include information concerning storage conditions and shipping cartons should be labeled appropriately. The recipient should be notified in advance of shipment.

11. FORMULATION

11.1. Frequency of Preparation

Formulations (diets) will be prepared bi-weekly at the Testing Facility.

Detailed preparation procedures are available in Attachment 3.

11.2. Adjustment for Activity/Purity

The test substance will be considered 95.8% active/pure for the purpose of dosage calculations.

11.3. Testing Facility Reserve Samples

The Testing Facility will reserve a sample of approximately 5 mL of each lot of bulk test substance and corn oil, and a sample (125 g) of each lot of the carrier used during the course of the study. Samples will be stored under the previously cited conditions.

12. ANALYSES

Results of required analyses will be provided to the Testing Facility for inclusion in the study report.

Samples additional to those described below may be taken if deemed necessary during the course of the study. Additional analyses, if required, will be documented by protocol amendment.

Before initiation of dosage, the homogeneity and concentration of the prepared formulations (diets) will be verified. Results of the homogeneity and concentration analyses of the first test substance diet preparation to be used during the study will be approved by the Study Director before administration. Thereafter, the concentration of the formulations (diets) will be verified on a monthly basis and the study director will approve each of the formulations (diets) prior to use. The study monitor will be notified of any deviations.

12.1. Acceptance Criteria

Acceptance criteria for analytical results for each group are defined as follows:

1) concentration results will be considered acceptable if the difference between the actual mean value and the targeted concentration is $\leq 10\%$ for diets; and 2) homogeneity results for a group will be considered acceptable if the relative standard deviation (RSD) for the formulation, calculated as the RSD for the grand mean of the average values for top, middle and bottom locations, is $\leq 5\%$. Results obtained outside of the criteria will be considered Out of Specification (OOS) and procedures for investigation and notification will be followed in the applicable laboratory Standard Operating Procedure covering OOS results.

12.2. Bulk Test Substance Stability

A sample of the bulk test substance will not be retained during the course of this study. Information to document or certify the stability of each lot of the bulk test substance will be provided by the Sponsor to the Testing Facility.

12.3. Analyses of Prepared Formulations

12.3.1. Concentration and Homogeneity

Homogeneity of the prepared diets will be verified during the course of this study according to a validated method (analytical procedure MALA02). Quadruplicate samples (25 g each) will be taken from the top, middle and bottom of each concentration from the first preparation on the day prepared. All samples will be transferred to the analytical laboratory at the Testing Facility. A duplicate set of samples from each quadruplicate set will be analyzed. The mean concentration result of the homogeneity analysis for each level will also be used to verify the concentrations for Week 1. The remaining samples will be retained refrigerated (2°C to 8°C), protected from light at the Testing Facility as backup samples.

Concentration of the prepared diets will be verified during the course of this study according to a validated method (analytical procedure MALA02). Duplicate samples (25 g each) from each concentration will be taken from each preparation. All samples will be transferred to the analytical laboratory at the Testing Facility. One sample of each set will be analyzed in duplicate. The remaining samples will be retained refrigerated (2°C to 8°C), protected from light at the Testing Facility as backup samples.

12.3.2. Stability

Stability data for prepared test substance formulations bracketing the range of concentrations was determined in Charles River Laboratories study number TQC00067DX. Prepared test substance formulations were stable at a concentration range of 40 ppm to 20000 ppm for at least 22 days under room temperature conditions and for at least 22 days under refrigerated conditions ($5 \pm 3^{\circ}\text{C}$).

12.4. Transfer Instructions

Concentration and homogeneity samples will be transferred to the analytical laboratory at the Testing Facility on the same day of preparation under ambient conditions:

Principal Investigator: Jason Sarsoza, B.S.
Charles River Laboratories, Preclinical Services, Pennsylvania
905 Sheehy Drive, Building A
Horsham, PA 19044
USA
Tel: 267.532.3771
E-mail:jason.sarsoza@crl.com

The recipient will be notified in advance of sample transfer.

13. DISPOSITION

Unused prepared diets will be discarded at the Testing Facility. Backup samples will be discarded at the Testing Facility prior to issuance of the final report. Disposition of the remaining bulk test substance will be documented in the raw data after consultation with the Sponsor.

14. TEST SYSTEM**14.1. Species/Strain and Reason for Selection**

The Crl:CD(SD) rat was selected as the Test System because: 1) it is one mammalian species accepted for use in toxicity studies; and 2) it has been widely used throughout industry for toxicity evaluations.

14.2. Number

Initial population acclimated: 135 male and 135 virgin female rats.

Population selected for Study: 50 male and 50 female rats (10 per sex per dosage group) will be assigned to the Main Study and 75 male and 75 female rats (15 per sex per dosage group) will be assigned for Cholinesterase Subset.

14.3. Sex

Both male and female rats will be evaluated.

14.4. Body Weight and Age

Male and female rats will be ordered to be approximately 35 days of age at receipt, at which time they will be expected to weight from 80 to 140 g each. Actual body weights will be recorded the day after receipt and will be documented in the raw data. The weight ranges will be included in the final report.

14.5. Source

Charles River Laboratories, Inc., Kingston, NY

The rats will be shipped in filtered cartons by air freight and/or truck from Charles River Laboratories, Inc., to the Testing Facility.

14.6. Identification

Rats are permanently identified using Monel[®] self-piercing ear tags. Male and female rats are assigned temporary numbers at receipt and given unique permanent identification numbers when assigned to the study before the first day of exposure.

15. ANIMAL HUSBANDRY

All cage sizes and housing conditions are in compliance with the *Guide for the Care and Use of Laboratory Animals*⁵.

15.1. Housing

During the acclimation and study periods, the rats will be individually housed in stainless steel, wire-bottomed cages.

15.2. Room Air, Temperature and Humidity

The animal room is independently supplied with at least ten changes per hour of 100% fresh air that has been passed through 99.97% HEPA filters. Room temperature will be maintained at 64°F to 79°F (18°C to 26°C) and monitored constantly. Room humidity will also be monitored constantly and maintained at 30% to 70%.

15.3. Light

An automatically controlled 12-hour light:12-hour dark fluorescent light cycle will be maintained. Each dark period will begin at 1900 hours (\pm 30 minutes). The light cycle may be adjusted by the Study Director or designee if deemed necessary to accommodate scheduled laboratory activities. Any such adjustment will be documented in the raw data.

15.4. Diet

Rats will be given either Certified Rodent Diet[®] #5002 (PMI[®] Nutrition International) only (carrier control group) or test diets prepared using Certified Rodent Diet[®] and the test substance. These will be available *ad libitum* from individual feeders.

15.5. Water

Water will be available *ad libitum* from individual bottles attached to the cages and/or from an automatic watering access system. All water will be from a local source and passed through a reverse osmosis membrane before use. Chlorine will be added to the processed water as a bacteriostat; processed water is expected to contain no more than 1.2 ppm chlorine at the time of analysis. Water is analyzed monthly for possible bacterial contamination and twice annually for possible chemical contamination.

15.6. Enrichment

Chewable Nylabones[®] will be supplied to all rats during the course of the study.

Analyses for possible contamination are conducted on each lot of Nylabones[®] and documented in the raw data.

15.7. Contaminants

The Study Director is not aware of any potential contaminants likely to be present in the certified diet, the drinking water or in the chewable enrichment devices at levels that could interfere with the results of this study. Therefore, no analyses other than those routinely performed by the feed supplier or those mentioned in this protocol will be conducted.

16. RANDOMIZATION AND ACCLIMATION

Upon arrival, rats will be assigned to individual housing on the basis of computer-generated random units. After at least 5 days of acclimation, rats will be selected for study on the basis of physical appearance and body weights recorded during acclimation. The rats will be assigned to dosage groups based on computer-generated (weight-ordered) randomization procedures so that the body weights of the rats do not exceed $\pm 20\%$ of the mean body weight of each sex.

At the time of randomization, the first 10 rats/sex/dosage group will be assigned to the main study and the remaining 15 rats/sex/dosage group will be assigned to the cholinesterase subset.

In order to accommodate the necropsy schedule, rats assigned to the main study will be assigned to four replicates (Replicates 1 and 2 will be male rats; Replicates 3 and 4 will be female rats) that will begin test diet exposure and will be sacrificed over four consecutive days.

Rats assigned to the cholinesterase subset will be assigned to two replicates by sex (Replicate 5 will be male rats; Replicate 6 will be female rats), and will begin exposure and will be sacrificed over two consecutive days.

17. ADMINISTRATION

17.1. Route of Exposure

The oral (diet) route was selected for use because it is a possible route of human exposure.

17.2. Method and Frequency

A constant concentration of the test substance in the diet will be offered to the rats, and the mg/kg/day dosages consumed will be calculated and presented for periods corresponding to body weight and feed consumption observations.

A carrier control and four test diet concentrations will be given to the rats. Rats will be given continual access to the test substance in the diet for 90 days. The first day of test diet exposure for each replicate will be day 1 of the study. Test diet concentrations may be adjusted if observed toxicity indicates that it is required.

17.3. Rationale for Dosage Selection

Dosage levels were selected by the Sponsor on the basis of previous studies conducted with the test substance.

The highest dosage level is expected to induce toxicity but not death or severe suffering. The descending sequence of the lower dosage levels were selected for the purpose of demonstrating any dosage-related response, with no adverse effects expected at the lowest level.

17.4. Dosage Levels and Concentrations

Dosage Group	Number of Rats Per Sex	Concentration (ppm)	Batch Number
I	10 ^a + 15 ^b	0 (Carrier Control)	B-TQC00066-A(Day.Month.Year)
II	10 ^a + 15 ^b	100	B-TQC00066-B(Day.Month.Year)
III	10 ^a + 15 ^b	500	B-TQC00066-C(Day.Month.Year)
IV	10 ^a + 15 ^b	5000	B-TQC00066-D(Day.Month.Year)
V	10 ^a + 15 ^b	10000	B-TQC00066-E(Day.Month.Year)

The test substance will be considered 95.8% active/pure for the purpose of dosage calculations.

- The first 10 rats/sex/dosage group will be assigned to the main study.
- The remaining 15 rats/sex/dosage group will be assigned to the cholinesterase subset.

18. TESTS, ANALYSES AND MEASUREMENTS**18.1. Viability**

All Periods: At least twice daily.

18.2. Clinical Observations and/or General Appearance

Acclimation Period: At least weekly.

Exposure Period: Daily.

Signs of toxicity will be recorded as observed, including the time of onset, degree and duration.

Clinical observations may be recorded more frequently than cited above.

18.3. Detailed Clinical Observations

Once prior to exposure and at least once weekly thereafter, detailed clinical observations will be conducted for all male and female rats. The detailed clinical observations will be conducted by an observer unaware of the group assignment of the rat.

18.4. Body Weights

Acclimation Period: At least weekly (not tabulated).

Exposure Period: Daily during the first 7 days of exposure for each replicate, and weekly thereafter.

Sacrifice: Terminal weight.

18.5. Feed Consumption Values

Acclimation Period:	Not recorded.
Exposure Period:	Daily during the first 7 days of exposure for each replicate, and weekly thereafter.
Day Prior to Sacrifice: (Main Study)	Feed left weight prior to the initiation of fasting.
Day of Sacrifice: (Cholinesterase Subset)	Feed left recorded.

Feed consumption values may be recorded more frequently if it is necessary to replenish the feed. These intervals will not be tabulated.

18.6. Ophthalmological Evaluation

Ophthalmological examinations will be performed by a veterinary ophthalmologist for all rats assigned to the main study prior to dosage and prior to sacrifice. The study day on which the examination is performed will be documented in the raw data. An ophthalmological examination report will be provided for inclusion in the Final Report.

19. HEMATOLOGY AND CLINICAL CHEMISTRY - MAIN STUDY

19.1. Clinical Pathology

At scheduled euthanasia on DS 91, whole blood samples (at least 3 mL, when possible) will be collected from rats assigned to the main study. Blood samples will be collected at scheduled necropsy from the inferior vena cava of each rat while under anesthesia (isoflurane/oxygen). **Rats will be fasted overnight (no more than 24 hours) prior to collection.** All samples will be used to evaluate hematological and clinical biochemical parameters, as further described in Sections 19.1.1 (Hematology), 19.1.2 (Clinical Chemistry).

Samples will be collected according to the following table.

Samples for Clinical Pathology Evaluation

Group Nos.	Time Point	Hematology	Clinical Chemistry
1-5 (Main Study)	DS 91	X	X

X = Sample to be collected

Any residual/retained clinical pathology samples will be discarded prior to issuance of the Final Report.

The tubes containing the samples will be labeled at minimum with the protocol number, rat number, group number, dosage level, day of study, collection interval, date of collection, species, generation and storage conditions.

19.1.1. Hematology

On DS 91, at least 1.5 mL of blood, when possible, will be transferred into K₂EDTA-coated (lavender top) tubes. All samples will be placed on a tilter and maintained at ambient conditions. Each sample will be checked for clots. Additional samples may be obtained (e.g., due to clotting of sample) if the permissible sample frequency and blood volume are not exceeded. Samples that contain clots will not be shipped or analyzed.

Hematology Parameters

Red blood cell count Hemoglobin concentration Hematocrit Mean corpuscular volume Mean corpuscular hemoglobin concentration Mean corpuscular hemoglobin Reticulocyte count (absolute) Mean platelet volume Platelet count	White blood cell count Neutrophil count Lymphocyte count Monocyte count Eosinophil count Basophil count Large unstained cells Other cells (as appropriate)
Note: Blood smear slides will be prepared for all animals for possible RBC morphology evaluation. Two slides per animal will be prepared at the Testing Facility and stained by PCS-Ohio. Slide review will only be performed on samples that meet flagging criteria to confirm accurate hematology data. If deemed necessary, all slides may be reviewed for RBC morphology at additional cost by protocol amendment	

Blood samples will be stored refrigerated until shipment (refrigerated on cold packs) on the day of collection. Differential leukocyte slides will be maintained and shipped at ambient conditions. All samples (whole blood and slides) will be shipped by overnight courier to arrive, if possible, on Tuesday through Friday. Upon receipt, Charles River Laboratories, Preclinical Services, Ohio will store the blood samples refrigerated until analysis (within 72 hours of collection) and store the slides at ambient conditions.

19.1.2. Clinical Chemistry

On DS 91, at least 1.5 mL of blood, when possible, will be transferred into serum separator tubes and centrifuged at room temperature for at least 10 minutes.

The resulting sera samples will be frozen on dry ice as soon as possible and maintained frozen ($\leq -60^{\circ}\text{C}$) until shipment for analysis of the following parameters:

Clinical Chemistry Parameters

Alanine aminotransferase	Total protein
Aspartate aminotransferase	Albumin
Alkaline phosphatase	Globulin
Gamma-glutamyltransferase	Albumin/globulin ratio
Total bilirubin	Glucose
Urea nitrogen	Cholesterol
Creatinine	Triglycerides
Calcium	Sodium
Phosphorus	Potassium
	Chloride

Samples will be shipped (on dry ice) by overnight courier to arrive on Monday through Friday. Upon receipt, Charles River Laboratories, Preclinical Services, Ohio will store the serum samples in a -20°C freezer until analysis.

19.1.3. Shipping Instructions

Correspondence regarding clinical pathology should be sent to the Principal Investigator and SPE-PAClinPath@crl.com.

Samples will be shipped according to the conditions described above to:

Principal Investigator: Rebecca M. Lucke B.S., MT (ASCP)
Charles River Laboratories, Preclinical Services, Ohio
640 N. Elizabeth St.
Spencerville, OH 45887
USA
Tel: 419.647.4196
Fax: 419.647.6560
E-mail: rebecca.lucke@crl.com

The recipient will be notified in advance of sample shipment. Copies of blood collection data sheets will be included in the shipment. A GLP-compliant report, signed by the Principal Investigator, will be provided to the Study Director for inclusion in the final report.

Following the completion of analysis and verification of the results, all residual clinical pathology samples will be discarded in accordance with applicable SOPs.

20. CHOLINESTERASE ASSAY - CHOLINESTERASE SUBSET

20.1. Blood and Brain Sample Collection

On the day of sacrifice, DS 91, whole blood samples (2 to 3 mLs each) will be collected once from each rat assigned to the cholinesterase assay. The time of each blood collection will be recorded in the raw data. Blood will be collected under isoflurane/oxygen anesthesia from the inferior vena cava (the rats will be in the isoflurane/oxygen for no longer than 5 minutes prior to blood collection). The time for each blood collection will be targeted to be ≤ 10 seconds and will be recorded using a stopwatch and documented in the raw data.

Samples will be processed and analyzed according to the Study Specific Procedure located in Attachment 4.

Blood samples will be maintained under cold packs on a tilter until being processed at the Testing Facility. The brains will be stored in saline on wet ice until being processed at the Testing Facility. All processed samples will be held on wet ice or refrigerated.

The blood and brain samples will be analyzed for cholinesterase levels at the Testing Facility the same day that they are collected. RBC and brain samples will be processed and assayed as soon as possible, with the experimental target that sample analysis will be initiated within 90 minutes of sacrifice.

Once assayed, samples will be stored refrigerated or on wet ice until transferred to frozen (-15°C to -30°C) storage. Samples will then be transferred and stored frozen (-15°C to -30°C). These samples will be discarded prior to issuance of the final report. Disposition of these samples will be documented in the raw data.

20.1.1. RBC

Prior to blood collection, syringes will be coated with EDTA to prevent clotting; 2 to 3 mLs of whole blood will be transferred into EDTA-coated (lavender-top) tubes. Blood samples will be stored under cold packs on a tilter until being processed and subsequently analyzed for RBC cholinesterase levels at the Testing Facility.

20.1.2. Brains

After blood sample collection and sacrifice, the brain will be excised and placed in a tared conical tube containing saline and maintained on wet ice. The brain will be weighed and the weight recorded to three decimal places. The brains will be stored in saline on wet ice until being processed and subsequently analyzed for cholinesterase levels at the Testing Facility.

21. TERMINAL PROCEDURES**21.1. Method of Sacrifice**

Rats assigned to the main study and cholinesterase subset will be anesthetized under the isoflurane/oxygen and following blood collection from the inferior vena cava, subsequently sacrificed by an injection of sodium pentobarbital into the inferior vena cava.

21.2. Rats Found Dead or Unscheduled Sacrifice

All rats that die or are sacrificed before scheduled termination will be examined for the cause of death or condition as soon as possible after the observation is made. Gross lesions will be retained in neutral buffered 10% formalin and examined histologically. In addition, the nasal passages, the nasal cavity and neck with associated organs and tissues will be examined. When not precluded by autolysis, the heart, lungs, liver, kidneys, stomach, spleen, and nasal passages will be retained in neutral buffered 10% formalin for possible histological evaluation. Additional tissues may be retained at the discretion of the Study Director.

In addition, rats assigned to the main study will be necropsied and examined to the extent possible as described in Section 21.4.2 (Rats Assigned to the Main Study).

See Attachment 5 for tissues to be weighed and retained and histological evaluations to be conducted (rats assigned to main study only). All other tissues will be discarded.

21.3. Scheduled Sacrifice

All rats will be sacrificed on DS 91, one day following the last day of control or test diet exposure, and evaluated as described in Section 21.4 (Necropsy).

21.4. Necropsy**21.4.1. Rats Assigned to the Cholinesterase Assay**

Male and female rats assigned for cholinesterase assay will be sacrificed following the last day of test diet exposure (DS 91) as described in Section 21.1 (Method of Sacrifice) and evaluated as described in Section 20 (Cholinesterase Assay).

21.4.2. Rats Assigned to the Main Study

Male and female rats assigned to the main study will be sacrificed on DS 91, necropsied and examined for gross lesions. Gross lesions will be retained in neutral buffered 10% formalin and examined histologically. Tissue trimming and histopathology will be performed under the supervision of or by a Board Certified Veterinary Pathologist.

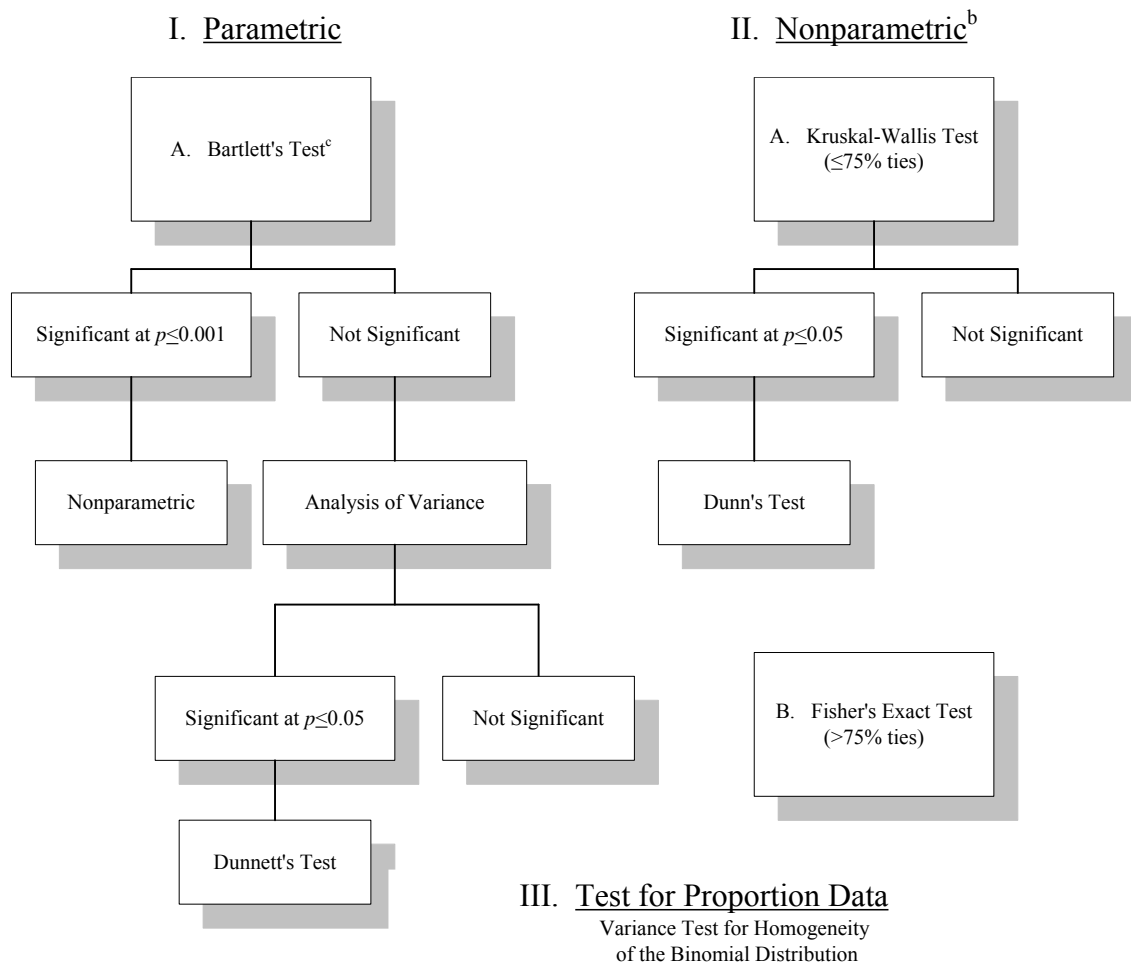
Gross necropsy will include an initial physical examination of external surfaces and all orifices, as well as an internal examination of tissues and organs *in situ*. The following will be examined: external and internal portions of all hollow organs; the external surfaces of the brain and spinal column; the nasal passages, the nasal cavity and neck with associated organs and tissues; the thoracic, abdominal and pelvic cavities with associated organs and tissues; and the musculo/skeletal carcass. The lungs will be perfused with neutral buffered 10% formalin.

See Attachment 5 for tissues to be weighed and retained, and histological evaluations to be conducted; all other tissues will be discarded.

22. PROPOSED STATISTICAL TESTS

Averages and percentages will be calculated. The following schematic represents the statistical analyses of the data:

Type of Test^a



-
- a. Statistically significant probabilities are reported as either $p \leq 0.05$ or $p \leq 0.01$.
 b. Proportion data are not included in this category.
 c. Test for homogeneity of variance.

Clinical observations and other proportional data will be analyzed using the Variance Test for Homogeneity of the Binomial Distribution⁶.

Continuous data (e.g., body weights, body weight changes, and feed consumption values) will be analyzed using Bartlett's Test of Homogeneity of Variances⁷ and the Analysis of Variance⁸, when appropriate [i.e., Bartlett's Test is not significant ($p > 0.001$)]. If the Analysis of Variance is significant ($p \leq 0.05$), Dunnett's Test⁹ will be used to identify the statistical significance of the individual groups. If the Analysis of Variance is not appropriate [i.e., Bartlett's Test is significant ($p \leq 0.001$)], the Kruskal Wallis Test¹⁰ is used ($\leq 75\%$ ties). In cases where the Kruskal Wallis Test is statistically significant ($p \leq 0.05$), Dunn's Method of Multiple Comparisons¹¹ will be used to identify the statistical significance of the individual groups. If there are greater than 75% ties, Fisher's Exact Test¹² will be used to analyze the data.

Count data will be evaluated using the procedures described above for the Kruskal-Wallis Test¹⁰.

Cholinesterase values for RBC and brains will be evaluated as separate dependent variables in one-way analyses of variance (ANOVA)⁸. In the event that the ANOVA is significant ($p \leq 0.05$), Dunnett's test⁹ will be used to identify the statistical significance of the individual groups.

Alternate or additional statistical evaluations may be performed if deemed necessary or appropriate following consultation with the Sponsor.

Statistical analysis will be performed on hematology and serum chemistry. To determine the appropriate statistical test for hematology and serum chemistry, each data set will be subjected to a statistical decision tree using the Toxicology Analysis System Customized (version 1.47.5 or higher). A minimum of three animals/sex/group per interval will be required for statistical analysis.

Data sets for each interval will be initially analyzed for homogeneity of variance using Levene's test¹³ followed by the Shapiro-Wilk test¹⁴ for normality. A $p < 0.001$ level of significance will be required for each test to reject the null hypothesis.

If both assumptions are fulfilled, a single-factor ANOVA will be applied, with animal grouping as the factor, utilizing a $p < 0.05$ level of significance. If the parametric ANOVA is significant at $p < 0.05$, Dunnett's test will be used to identify statistically significant differences between the control group and each test article treated group at the 0.05 level of significance.

If either of the parametric assumptions is not satisfied, then the Kruskal-Wallis nonparametric ANOVA procedure will be used to evaluate intergroup differences ($p < 0.05$). If the non-parametric Kruskal-Wallis ANOVA is significant at $p < 0.05$, Dunn's test will be used to identify statistically significant differences between the control group and each test article-treated group using a minimum significance level of $p < 0.05$.

23. DATA ACQUISITION, VERIFICATION AND STORAGE

Data generated during the course of this study will be recorded either by hand or using the *Argus Automated Data Collection and Management System*, the *Vivarium Temperature and Relative Humidity Monitoring System* and/or chart recorders, *Dispense*, *TotalChrom*[®], Version 6.2.1 (for HPLC) *Softmax*[®] PRO (for UV/VIS on Softmax), and/or SPECTRAmax 190. All data will be tabulated, summarized and/or statistically analyzed using the *Argus Automated Data Collection and Management System*, the *Vivarium Temperature and Relative Humidity Monitoring System*, SoftMax[®] PRO 4.0, *Microsoft Excel* [part of Microsoft[®] Office 2003 (or later versions)], Quattro Pro 8 and/or *The SAS System* (version 6.12).

Records will be reviewed by the Study Director and/or appropriate management personnel within 21 days after generation. All original records will be stored in the archives at the Testing Facility. All raw data will be bound and indexed. The archived raw data will be scanned and retained on CD-ROM in an Adobe[®] Acrobat PDF file. A copy of all raw data will be supplied to the Sponsor upon request. Preserved tissues will be stored at the Testing Facility at no additional charge for one year after delivery of the final report, after which time the Sponsor will be contacted to determine the disposition of these materials.

The following computerized systems will be used by PCS-OH during the course of the clinical pathology analyses phase of the study.

Critical Computerized Systems

System Name	Version Number	Description of Data Collected and/or Analyzed
Compaq Alpha DS10 Computer using the Toxicology Analysis System Customized, General Toxicology Module	1.0.0 or higher	Applicable clinical pathology data
Systems 600 Apogee Insight System	3.0 or higher	Temperature and/or humidity (animal rooms, refrigerators, freezers, and compound storage, as applicable)

All original clinical pathology data, slides, and report will be returned to Charles River Laboratories, Preclinical Services, Pennsylvania, USA for archiving at the completion of the study.

24. RECORDS TO BE MAINTAINED

Protocol, Amendments and Deviations.
Test Substance, Carrier and/or Reagent Receipt, Preparation and Use.
Animal Acquisition.
Randomization Schedules.
Supportive Care (if prescribed by Staff Veterinarian).
General Comments.
Clinical Observations and/or General Appearance.
Detailed Clinical Observations.
Body Weights.
Feed Consumption Values.
Ophthalmological Evaluations.
Blood and Brain Sample Collection and Processing
Cholinesterase Data.
Gross Necropsy Observations.
Organ Weights.
Tissue Sample Collection, Processing and Shipment.
Photographs (if required).
Study Maintenance (room and environmental records).
Feed, Enrichment, and Water Analyses.
Packing and/or Shipment Lists.
Analytical Procedure for Test Substance Analysis.
Analytical Results.

25. KEY PERSONNEL

Director of Research: Alan M. Hoberman, Ph.D., DABT, Fellow ATS
Study Director and Senior Research Scientist: John F. Barnett, Jr., B.S.
Director of Reproductive and Neurobehavioral Toxicology: Elise M. Lewis, Ph.D.
Director of Operations: Matthew J. Vaneman, B.S.
Associate Director of Regulatory Compliance: Nancy A. Catricks, M.S.
Senior Staff Veterinarian: Dena C. Lebo, V.M.D., Division Veterinarian
Chair, Institutional Animal Care and Use Committee: Joseph W. Lech, B.S., LAT
Clinical Pathology: Rebecca M. Lucke B.S., MT (ASCP), Charles River Laboratories
Preclinical Services, Ohio
Bone Marrow Evaluations: Angela Wilcox, BVSc, MS, DACVP, Charles River
Laboratories, Preclinical Services, Reno
Consultant, Veterinary Ophthalmology: Lionel F. Rubin, V.M.D.
Consultant, Veterinary Pathology: Carol J. Detrisac, DVM, PhD, DACVP, Charles River
Laboratories, Pathology Associates, Illinois
Senior Manager Laboratory Sciences: Julian Gulbinski, III, B.S., M.B.A - Cholinesterase
Analyses

26. FINAL REPORT

The Study Director will provide periodic updates of study progress to the Sponsor. Draft summary tables of unaudited computer-recorded data may accompany these updates. Statistical analyses will not be performed on these interim data.

A comprehensive draft final report will be prepared on completion of the study and will be finalized following consultation with the Sponsor. The report will include the following:

- Summary and Conclusion.
- Experimental Design and Method.
- Evaluation of Test Results.
- Appendices: Figures, Summary and Individual Tables Summarizing the Above Data, Protocol and Associated Amendments and Deviations, Study Director's GLP Compliance Statement, Reports of Supporting Data (if appropriate), QAU Statement, and Certificate of Analysis of Test Substance.

The Sponsor will receive an electronic copy of the draft report. A copy of the final report will be provided by e-mail or on CD-ROM in Adobe Acrobat PDF format. The PDF document will be created from native electronic files to the extent possible, including text and tables generated by the Testing Facility. Report components not available in native electronic files and/or original signature pages will be scanned and converted to PDF image files for incorporation. The hard copy of the report with original signatures retained at the Testing Facility will be considered the GLP-compliant original.

Study reports should be finalized within six months of submission of the audited draft final report. Two Sponsor-requested revisions to the draft report will be addressed by the Testing Facility at no charge. Additional revisions to the draft report or amendments to the final report may incur additional costs. If the Sponsor has not provided comments to the report within six months of draft submission, the report will be finalized by the Testing Facility.

27. ANIMAL WELFARE

Animal care and use will be in accordance with the Animal Welfare Act regulations (9 CFR, Parts 1, 2 and 3), the conditions specified in the *Guide for the Care and Use of Laboratory Animals*⁵, the relevant SOPs of the Testing Facility, and the protocol. Anticipated or suspected clinical signs and supportive care agreed upon by the Study Director, veterinary staff and Sponsor should these clinical signs be observed are documented in the IACUC proposal for this study.

Adverse observations will be promptly reported to the Study Director and veterinary staff. The veterinarian may make recommendations regarding care of the animal(s) in addition to those already agreed upon and/or alteration of study procedures to ensure the well-being of the animal(s) should unanticipated responses or circumstances occur. All recommendations shall be discussed with the Study Director and the recommendations and subsequent actions properly documented in the study record. Supportive care of the animal(s) may occur without notification of the Sponsor when such supportive care, as determined by the Study Director, does not adversely affect the study objectives.

If the condition of the animal(s) warrants therapeutic intervention or alterations in study procedures above the previously-agreed-upon conditions, the Sponsor will be contacted, whenever possible, to discuss appropriate action. If the condition of the animal(s) is such that immediate measures must be taken to relieve pain and/or distress, the attending veterinarian will attempt to consult the Study Director prior to initiating medical action, but the veterinarian has the authority to act immediately at his/her discretion to address the condition under these circumstances. The Sponsor will be informed by the Study

Director of any such event as soon as possible.

28. INSTITUTIONAL ANIMAL CARE AND USE COMMITTEE STATEMENT

The procedures described in this protocol have been reviewed by the Testing Facility's Institutional Animal Care and Use Committee. All procedures described in this protocol that involve study animals will be conducted in a manner to avoid or minimize discomfort, distress or pain to the animals.

The signature of the Sponsor's representative below is assurance that the study is not an unnecessary duplication of previous work. Documentation for the necessity of this study may be obtained from the Sponsor. No alternative procedures were available to meet the stated purposes of the study.

29. REFERENCES

- 1) OECD guidelines for the testing of chemicals. Repeated dose 90-day oral toxicity study in rodents, No. 408 section 4 Health Effects (Pink pages); last updated September 21, 1998. Organisation for Economic Co-operation and Development.
- 2) Health effects test guidelines: 90-day oral toxicity in rodents, OPPTS 870.3100; August 1998; Prevention, Pesticides and Toxic Substances. U.S. Environmental Protection Agency.
- 3) Federal Insecticide, Fungicide and Rodenticide Act/Toxic Substances Control Act (FIFRA/TSCA); Good laboratory practice standards; Final Rule 40 C.F.R. Part 160/792; August 17, 1989. U.S. Environmental Protection Agency.
- 4) OECD Principles of good laboratory practices, [C(97)186/Final] (1998); Environmental Health and Safety Division. OECD Environment Directorate.
- 5) Institute of Laboratory Animal Resources Commission on Life Sciences and the National Research Council. *Guide for the care and use of laboratory animals*. Washington (D.C.): National Academy Press; 1996.

- 6) Snedecor GW, Cochran WG. Variance test for homogeneity of the binomial distribution. *Statistical methods. 6th Ed.* Iowa State University Press, Ames; 1967. p. 240-1.
- 7) Sokal RR, Rohlf FJ. Bartlett' s test of homogeneity of variances. *Biometry: the principles and practice of statistics in biological research.* San Francisco (CA): Freeman & Co; 1969. p. 370-1.
- 8) Snedecor GW, Cochran WG. Analysis of variance. *Statistical methods. 6th Ed.* Iowa State University Press, Ames; 1967. p. 258-98.
- 9) Dunnett CW. A multiple comparison procedure for comparing several treatments with a control. *J Am Stat Assoc* 1955;50:1096-121.
- 10) Sokal RR, Rohlf FJ. Kruskal-Wallis test. *Biometry: the principles and practice of statistics in biological research.* San Francisco (CA): Freeman & Co; 1969. p. 388-91.
- 11) Dunn OJ. Multiple comparisons using rank sums. *Technometrics* 1964;6(3):241-52.
- 12) Siegel S. The Fisher's exact probability test. *Nonparametric statistics for the behavioral sciences.* New York (NY): McGraw-Hill Co; 1956. p. 96-105.
- 13) Levene H. Robust tests for equality of variance. In: Olkin et al., editor. *Contributions to probability and statistics. Ed. I.* Palo Alto (CA): Stanford University Press; 1960. p. 278-92.
- 14) Shapiro SS, Wilk MB. An analysis of variance test for normality (complete samples). *Biometrika* 1965;52:591-611.
- 15) Young, J.T., Histopathologic Examination of the Rat Nasal Cavity. *Fund. Appl. Toxicol.* 1:309-312, 1981

30. PROTOCOL APPROVAL

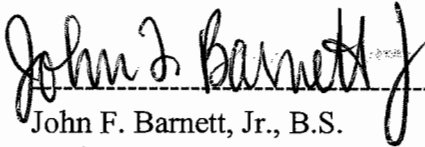
30.1. For the Testing Facility



Elise M. Lewis, Ph.D.
Director of Reproductive and Neurobehavioral
Toxicology
Management Representative

11 Jan 2011

Date



John F. Barnett, Jr., B.S.
Senior Research Scientist
Study Director

11 Jan 2011

Date

30.2. For the Sponsor^a



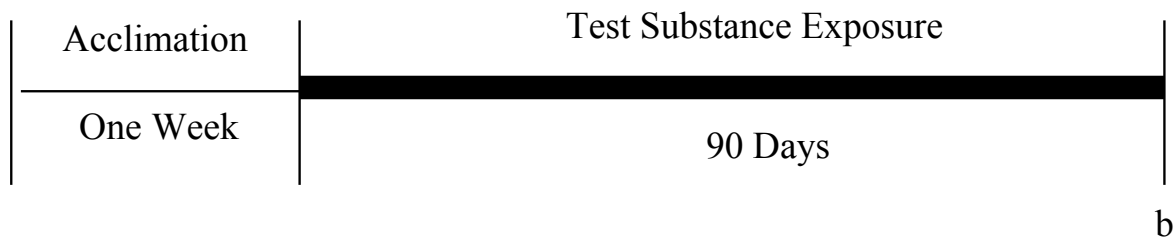
M. Jensen
Study Monitor



Date

a. Date of Sponsor Approval: 10 January 2011

ATTACHMENT 1 -
SCHEMATIC OF STUDY DESIGN AND PROPOSED STUDY SCHEDULE

STUDY SCHEMATIC**REPEATED DOSE 90-DAY TOXOCITY STUDY IN RATS^a**

 Exposure Period.

- a. For additional details, see "Tests, Analyses and Measurements" section of the protocol.
- b. All surviving rats will be sacrificed on DS 91, and a gross necropsy will be performed (main study), or the brains and RBC evaluated for cholinesterase levels (cholinesterase subset).

PROPOSED SCHEDULE^a

11 JAN 2011	Animal Receipt and OECD Experimental Start Date.
18 JAN 2011	Proposed EPA Experimental Start Date.
21 JUL 2011	Draft Final Report and Experimental Termination/Completion Date.

Main Study

18 JAN 2011 - 20 APR 2011	Exposure Period (Day 1 to 90 of Study).
18 APR 2011 - 21 APR 2011	Replicates 1 through 4 - Sacrifice and Blood Sample Collection (DS 91).
18 APR 2011 - 21 APR 2011	Shipment of Hematology Samples.
21 APR 2011	Shipment of Clinical Chemistry Samples.
28 APR 2011	Shipment of Tissue Samples.

Cholinesterase Subset

26 JAN 2011 - 26 APR 2011	Exposure Period (Day 1 to 90 of Study).
26 APR 2011	Sacrifice and Cholinesterase Evaluation [DS 91 - Replicate 1 (Male Rats)].
27 APR 2011	Sacrifice and Cholinesterase Evaluation [DS 91 - Replicate 2 (Female Rats)].

a. The study initiation date is the date the Study Director signs the protocol.

**ATTACHMENT 2 -
CERTIFICATE OF ANALYSIS**



Cheminova A/S
P.O. Box 9
DK-7620 Lørvig
Denmark

Phone (+45) 96 90 96 90
Fax (+45) 96 90 96 91
www.cheminova.com
CVR-No. DK12760043

Certificate of Analysis

TEM 010-08

Test substance certified:

Test substance:	Malathion Technical fortified		
CHA Code No.:	-		
Batch No.:	D2014-OSJ-MLT-01-S		
Origin of test substance:	<input checked="" type="checkbox"/> Laboratory	<input type="checkbox"/> Pilot plant	<input type="checkbox"/> Commercial

Analysis:

Content of Malathion:	95.8% w/w
Identified by:	¹ H-NMR and ¹³ C-NMR Spectroscopy, Mass Spectrometry and IR Spectroscopy
Quantified by:	GC (Method VAM 001-02)
Date of analysis:	September 28, 2010

Information of the test substance:

Appearance:	Pale yellowish liquid
Storage:	Refrigerator
Tap density:	Not determined
Expiry date:	September 28, 2013

Information of analyte(s):

Common name:	Malathion
CAS name:	Butanedioic acid ((dimethoxyphosphino-thioyl) thio)-, diethyl ester
CAS No.:	121-75-5
Molecular formula:	C ₁₀ H ₁₉ O ₆ PS ₂
Molecular mass:	330.36 g/mol
Structure formula:	

Statement of GLP Compliance

The identification and quantification were performed at Cheminova A/S and conducted according to FIFRA Good Laboratory Practice Standards, 40 CFR Part 160 and the OECD Principles of Good Laboratory Practices.

Date

November 9, 2010

Barbara Hinz

**ATTACHMENT 3 -
TEST SUBSTANCE PREPARATION AND USAGE PROCEDURES**

ATTACHMENT 3

TEST SUBSTANCE PREPARATION AND USAGE PROCEDURES

Test Substance: Malathion Technical (CHA 300), batch#: D2014-OSJ-MLT-01-S

Carrier: The meal form of Certified Rodent Diet[®] #5002 (PMI[®] Nutrition International) containing 5% corn oil (the corn oil will serve as a dust-reducing agent only)

A. Purpose:

The purpose of this procedure is to provide a method for the preparation of diet containing the test substance for oral (diet) administration to rats on Study No. TQC00066.

B. General Information:

1. All diet containers will be labeled and color-coded. Each label will specify the study number, test substance or carrier identification, batch number, concentration, dosage level, dosage group, preparation date, expiration date, and storage conditions, as applicable.
2. Formulations (diets) will be prepared bi-weekly at the Testing Facility. The prepared diets can be used for up to 22 days after preparation if stored refrigerated or at room temperature.
3. Safety:
 - Double nitrile gloves, uniform, appropriate eye protection
 - Full-faced Positive-Pressure Hood
 - Tyvek[®] Suit
 - The bulk test substance will be handled inside a chemical fume hood
 - All gloves will be washed with soap and water or sprayed with an appropriate cleaning solution prior to removal and then disposed in a biohazard container.

4. The test substance will be considered 95.8% active/pure for the purpose of dosage calculations.
 5. Sampling requirements: Cited in protocol
 6. Storage: Cited in protocol
- C. Test Substance Diet Preparation (40 kg preparation size per group):

NOTE: Prior to formulation of the test substance diet preparations, remove the bulk container of test substance from storage and allow the test substance to equilibrate to ambient room temperature for at least 30 minutes prior to opening the container.

Additional preparation sizes may be prepared if necessary. The calculations will be completed on a TA/S Calculation Sheet and will be kept in the raw data.

1. The following steps are completed for each concentration, beginning with the carrier only group (0 ppm) preparation and continuing from the lowest to the highest concentration of the test substance. The carrier only group will be prepared as described below except no test substance will be added (the steps below that apply are: C.1.a, C.1.b, C.1.j through C.1.dd).
 - a. Weigh out the amount of certified rodent diet required to prepare a single concentration (see PREPARATION CALCULATIONS) into an appropriately sized and labeled container. All of the diet used in the subsequent procedure will be taken from this aliquot.
 - b. Check the placement of the intensifier bar in the twin shell blender and ensure that the blender port (bottom) of the twin shell blender is closed then place at least 3 kg of the diet into the twin shell blender.
 - c. Place at least 3 kg of the weighed diet from step C.1.a into a Hobart® mixing bowl.
 - d. Add at least 100 g of diet to an appropriately sized mortar.

- e. Weigh out the required amount of test substance (see PREPARATION CALCULATIONS). Quantitatively transfer the test substance onto the diet in the mortar. Using an appropriately sized pestle grind the diet and test substance together until visually homogeneous.
- f. Transfer the mixture from the mortar to the diet in the Hobart[®] mixing bowl. Rinse the mortar and pestle with additional diet, as needed, to remove any residue. Transfer all rinses to the Hobart[®] mixing bowl.
- g. Turn the Hobart[®] mixer on and mix for at least 15 minutes using an appropriate mixing blade.
- h. Following completion of mixing, turn off the mixer.
- i. Transfer the diet pre-mix to the twin shell blender.
- j. Place at least 3 kg of the weighed diet from step C.1.a into a Hobart[®] mixing bowl.
- k. Using an appropriately-sized, tared beaker measure 1000 g of corn oil (2.5% of the final prep amount).
- l. Quantitatively transfer the corn oil to the Hobart[®] mixing bowl containing the diet described in step C.1.j above. Rinse any corn oil residue using blank diet.
- m. Turn the Hobart[®] mixer on and mix for at least 3 minutes using an appropriate mixing blade.
- n. Following completion of mixing, turn off the mixer.
- o. Transfer the diet pre-mix to the twin shell blender.
- p. Place at least 3 kg of the weighed diet from step C.1.a into a Hobart[®] mixing bowl.
- q. Using an appropriately-sized, tared beaker measure 1000 g of corn oil (2.5% of the final prep amount).

- r. Quantitatively transfer the corn oil to the Hobart® mixing bowl containing the diet described in step C.1.p above. Rinse any corn oil residue using blank diet.
- s. Turn the Hobart® mixer on and mix for at least 3 minutes using an appropriate mixing blade.
- t. Following completion of mixing, turn off the mixer.
- u. Transfer the diet pre-mix to the twin shell blender.
- v. Place at least 3 kg of the weighed diet from step C.1.a into a Hobart® mixing bowl.
- w. Turn the Hobart® mixer on and mix for at least 3 minutes using an appropriate mixing blade.
- x. Following completion of mixing, turn off the mixer.
- y. Transfer the diet rinse to the twin shell blender.
- z. Place the remaining weighed diet from step C.1.a into the twin shell blender, then close the twin shell blender. Turn on the twin shell blender and then turn on the intensifier bar. Check for leakage of feed from the lids.
- aa. Run the intensifier bar and blender for at least 15 minutes.
- bb. Following completion of the required mixing time, turn off the intensifier bar and blender.
- cc. Center the collection bag/container under the blender port and collect the prepared diet. Analytical samples can now be taken.
- dd. After sampling, divide the preparation into 2 aliquots.
- ee. The prepared aliquots will be stored refrigerated until needed for use. Each week one aliquot will be removed from the refrigerator

for the week's use for filling and/or topping off the diet feed jars. Once removed from the refrigerator, the aliquot will be allowed to equilibrate to ambient temperature prior to the opening of the aliquot container. Once equilibrated to ambient temperature, the aliquot will remain at room temperature for possible use up to the expiration date. Filled feed jars will be dispensed and maintained at ambient conditions during the exposure period up to the date of discard.

- ff. Repeat this process (steps C.1.a to C.1.ee) for each concentration
2. Clean the blender and intensifier bar and all other equipment according to Standard Operating Procedures.

Version: TQC00066(10.JAN.2011) # of pages: 5

Calculations
Calculated By: Michael D. Kressan Date: 11 JAN-2011

Calculations
Recalculated By: Julian Gulchick Date: 11 Jan 2011

Verified and
Approved By: John F. Barnett Date: 11 Jan 2011

ATTACHMENT 4 -
STUDY-SPECIFIC PROCEDURE FOR THE CHOLINESTERASE
EVALUATION OF RAT BRAINS AND RBC

ATTACHMENT 4 -**STUDY-SPECIFIC PROCEDURE FOR
THE CHOLINESTERASE EVALUATION OF RAT BRAINS AND RBC**

Purpose: This Study Specific Procedure describes the steps used to evaluate cholinesterase levels in rat brain tissue and red blood cells.

I. DEFINITIONS AND ABBREVIATIONS

<u>Abbreviation</u>	<u>Definition</u>
0.1M Monobasic	0.1M Monobasic Sodium Phosphate Buffer
0.1M Dibasic	0.1M Dibasic Sodium Phosphate Buffer
pH8 buffer	0.1M Sodium Phosphate Buffer, pH 8
0.1% Tween [®] buffer	0.1% Tween [®] in Sodium Phosphate Buffer, pH 8
ACHE	Acetylcholinesterase
ATC	Acetylthiocholine iodide
DTNB	5,5'-dithio-bis (2-nitrobenzoic acid)
RA	Rat Albumin, fraction V
0.1% RA buffer	0.1% Rat Albumin in 0.1% Tween [®] buffer
I.D.	Identification – For chemicals in their original container, the ID is the lot number. For reagents prepared in-house, the ID is the identifier.
LLOQ	Lower Limit Of Quantification
LOD	Limit Of Detection
Optical Density (OD)	A unit of measure; the relative intensity for a given wavelength of light.
RBC	Red blood cells
ULOQ	Upper Limit Of Quantification
Vmax	Rate of change of the Optical Density (OD) per minute, usually expressed as (milli-OD/min)

II. BACKGROUND

The method for cholinesterase is based on Ellman's method, where one unit of ACHE will hydrolyze one micromole of ATC into choline and acetic acid per minute at pH 8.0, 37°C. Choline then reacts instantaneously with DTNB resulting in a yellow color. A standard curve is prepared with each standard having a different concentration of ACHE. A fixed amount of ATC and DTNB are added to the standards and unknowns. The rate

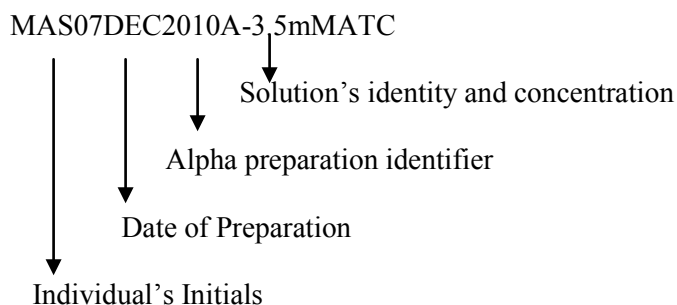
of color change (V_{max}) is captured using a microtiter plate reader. The ACHE concentration in the unknowns is then back calculated on the standard curve using linear, unweighted regression.

III. PROCEDURE

A. Documentation

1. Reagents and standards are each prepared according to the formulas in Reagent Preparation Procedures and each is given a unique identifier. The identifier includes the initials of the individual preparing the solution, the date of preparation, a letter to indicate a particular preparation and the solution's concentration and identity.

Refer to the following example:



B. Reagent Preparation Documentation

1. Reagent preparation is documented on the Reagent Preparation Form. The complete reagent name and concentration are recorded on the Reagent line (e.g. 3.5mM ATC). The reagent identifier is recorded on the I.D. line. The preparer's initials and the date prepared are entered on the appropriate lines.
2. Each chemical used for the preparation of the reagent is documented in the table. For chemicals in their original container from the manufacturer, the lot number and manufacturer are identified and the I.D. box does not apply. For chemicals prepared in the laboratory (e.g. a stock solution), the reagent I.D. is recorded and the manufacturer and lot number boxes do not apply. NA is entered in each box that does not apply. Refer to the example below:

CHEMICAL	LOT #	MFG	I.D.	AMT
Rat Albumin	123456	Sigma	NA	1g
0.1% Tween buffer	NA	NA	MAS07DEC2010A-Tween	1000 mL

3. Any equipment used in the preparation is recorded. This includes, but is not limited to, pipettes, balances, volumetric flasks and pH meters. The storage conditions of the reagent and an expiration date are assigned. The expiration date is the date of the ingredient with the shortest lifetime
 - a. General reagents expire one month from the time of preparation as long as they are stored refrigerated.
 - b. Critical reagents are only good for the day they are prepared.

C. Sample Processing Documentation

1. Two forms are available for documenting sample processing. The first form, Brain Sample Processing, is for documenting the steps taken in the processing of brains. The second form, Blood Sample Processing, is for documenting steps taken in the processing of blood.
 - a. Brain Sample Processing

The animal number for each sample is recorded in the sample section. The technician(s) performing each activity fill out the corresponding portions of the form.
 - b. Blood Sample Processing

The animal number for each sample is recorded in the sample section. The sample may be processed in the vial in which it came. The technician(s) performing each activity fill out the corresponding portions of the form.

If a blood sample contains a clot, it should be footnoted. The footnote should include information as to whether the removal of the clot resulted in insufficient volume for processing or if there was still sufficient sample to be processed.

D. Run Documentation Form

1. The Run Documentation Form identifies the Run I.D., description, acceptance or failure of each run, the reagents added to each well, the initials and date of the technician performing each analysis.

IV. PREPARATION OF STANDARDS

A. Preparation and Analysis of the Glutathione Reference Solutions

Note: All activities for the preparation of the L-Glutathione are recorded on the GLUTATHIONE PREPARATION form.

1. Prepare a working stock solution of one milli-Molar (mM) L-Glutathione by dissolving 30.73 ± 2 mg of L-Glutathione reduced form, (Sigma G-4251 or equivalent) in 100 mL of pH8 buffer. Different preparation sizes may be used as long as the proportions remain the same.
2. Prepare a set of L-Glutathione standards according to the table below.

Glutathione Concentration (mMolar)	Reference Solution I.D.	Working Stock Volume (mL)	Volume of pH 8 buffer (mL)	Final Volume (mL)
1.00	G1	2.00	0.00	2.00
0.90	G2	1.80	0.20	2.00
0.80	G3	1.60	0.40	2.00
0.70	G4	1.40	0.60	2.00
0.60	G5	1.20	0.80	2.00
0.50	G6	1.00	1.00	2.00
0.40	G7	0.800	1.20	2.00
0.30	G8	0.600	1.40	2.00
0.20	G9	0.400	1.60	2.00
0.10	G10	0.200	1.80	2.00

3. Analyze a new empty plate as a “pre-read” plate using an endpoint analysis at a wavelength of 435 nm. This is used as the background to subtract differences between wells.

4. Using the pre-read plate add 10 mcL of each Glutathione reference solution or blank (pH8 buffer) to individual wells. Each concentration of glutathione should have an n=6 and the blanks should have an n=4. Add 250 mcL 0.65 mM DTNB solution and 100 mcL pH 8 buffer to each of the wells.
5. Place the prepared plate into the instrument and set the instrument to incubate for approximately 10 minutes at 37°C. After the incubation, analyze the plate using an endpoint at 435nm.
6. SOFTMax PRO 4.0 prepares a linear least squares regression based on the data collected and generates a slope, intercept, and R^2 (R squared). The acceptance criteria, the R^2 value is > 0.975 and the acceptance criteria for the slope is 0.310 OD/10 micromoles $\pm 10\%$. Multiply this slope by 1000 to convert it into mOD/10 mcL for future comparison (i.e. 310 mOD/10 mcL).
7. If either the slope or the R^2 acceptance criteria are not met, then one replicate from each of the concentrations (no more than 25%) may be excluded (i.e. masked) and the slope and R^2 recalculated. If, after masking, the slope and/or the R^2 still do not meet the acceptance criteria, new solution(s) are prepared.

B. Preparation of ACHE Standards

The following procedure is used when preparing ACHE standards. The standards are aliquotted for daily use and stored frozen (at -15°C to -30°C) for up to eight days. Once thawed, aliquots may not be refrozen; standards should be kept cold (refrigerated or on cold packs) while in use and are discarded at the end of each day.

Standards are prepared using two working stock solutions of varying concentration in order to achieve the most accurate standard curves. Standards are to be prepared as needed for each study, high standard curve or low standard curve or both. All activities are recorded on the ACHE STANDARD PREPARATION form.

1. Preparation of ACHE stock solution

- a. Each vial of acetylcholinesterase standard from Sigma Chemical Cat# C2888 comes as a lyophilized dry powder. Each vial is labeled with the mg quantity and the activity associated with each lot of material. The activity per vial will determine the number of vials used for the preparation of the stock solution. The target theoretical final concentration of the stock solution is between 100 units/mL and 200 units/mL, although this may be adjusted as necessary according to the activity level per vial.
- b. Reconstitute each of the required number of vials with 1.0 mL of R.O. deionized water. Mix by inversion and allow the vials to sit at room temperature for at least 15 minutes.
- c. Pool the solutions from each vial into a 25 mL volumetric flask. Rinse each vial three times with 0.1% Rat Albumin buffer and transfer the rinse aliquot into the same 25 mL volumetric flask. Q.S. to the final required volume with 0.1% Rat Albumin buffer. Mix by inversion.

- d. Theoretical concentration of each vial is calculated by multiplying the amount of mg solid within the vial by the amount of units/mg solid. This product is then multiplied by three (the # of vials used), then divided by the 25 mL, the final solution volume.

For example: each vial = 1.52 mg solid; each mg = 658 U/mg solid
 $1.52 \text{ mg solid} \times 658 \text{ U/mg solid} = 1000.16 \text{ U/vial}$
 $1000.16 \text{ U/vial} \times 3 \text{ vials} = 3000.48 \text{ U}$
 $3000.48 \text{ U} \div 25 \text{ mL} = 120.0192 \text{ U/mL} = \text{Theoretical Concentration}$

- e. This stock solution is stable for 6 months from time of preparation at $5^{\circ}\text{C} \pm 3^{\circ}\text{C}$.
- f. The theoretical concentration calculated will be used to prepare ACHE standards.

2. Working Stocks

Prepare working stock solution A at a concentration of 2.500 U/mL and working stock solution B at a concentration of 2.000 U/mL.

This can be accomplished by multiplying the desired final volume by the desired working stock concentration, and dividing this product by the manufacturers labeled concentration. This will yield the volume of stock solution needed to make the desired working stock solution. Once the solutions have been prepared, the solutions will be vortexed thoroughly.

Example Calculation:

Desired Volume = 25 mL

Desired Working Stock A Concentration = 2.5 U/mL

Prepared solution concentration = 120.0192 U/mL

$$25 \text{ mL} \times 2.5 \text{ U/mL} / 120.0192 \text{ U/mL} = 0.521 \text{ mL}$$

3. Calibration Standards- Low Curve

Prepare a set of standards representing the low concentration calibration curve by pipetting the appropriate amount of working stock into individual volumetric flasks. Bring to volume with 0.1% rat albumin buffer. Mix well. The standards may be aliquotted and stored in vials or tubes for 8 days at -15°C to -30°C. Refer to the table below for standard preparation proportions. The preparation size may be adjusted if necessary to prepare the correct volume needed for each study, as long as the proportions are maintained. If necessary, LB3 may be diluted as needed with 0.1% Rat Albumin buffer in order to expand the range of the standard curve. This will be done to capture the scientifically significant inhibition levels.

Working Stock Solution	Volume of Stock Solution (mL)	Final Volume (mL)	Diluent	Standard I.D.	Target Concentration (U/mL)
Working Stock A	0.600	10.0	0.1% Rat Albumin	LA1	0.150
Working Stock B	0.500	10.0	0.1% Rat Albumin	LB1	0.100
Working Stock A	0.280	10.0	0.1% Rat Albumin	LA2	0.070
Working Stock B	0.250	10.0	0.1% Rat Albumin	LB2	0.050
Working Stock A	0.120	10.0	0.1% Rat Albumin	LA3	0.030
Working Stock B	0.075	10.0	0.1% Rat Albumin	LB3	0.015
Working Stock A	0.060	20.0	0.1% Rat Albumin	LA4	0.0075

4. Calibration Standards- High Curve

Prepare a set of standards representing the high concentration calibration curve by pipetting the appropriate amount of working stock into individual volumetric flasks. Bring to volume with 0.1% Rat Albumin Buffer. Mix well. The standards may be aliquotted and stored in vials or tubes for 8 days at -15°C to -30°C. Refer to the table below for standard preparation proportions. The preparation size may be adjusted if necessary to prepare the correct volume needed for each study, as long as the proportions are maintained. If necessary, HB3 may be diluted as needed with 0.1% Rat Albumin buffer in order to expand the range of the standard curve. This will be done to capture the scientifically significant inhibition levels.

Working Stock Solution	Volume of Stock Solution (mL)	Final Volume (mL)	Diluent	Standard I.D.	Target Concentration (U/mL)
Working Stock A	2.00	5.0	0.1% Rat Albumin	HA1	1.00
Working Stock B	2.00	5.0	0.1% Rat Albumin	HB1	0.80
Working Stock A	1.20	5.0	0.1% Rat Albumin	HA2	0.60
Working Stock B	1.00	5.0	0.1% Rat Albumin	HB2	0.40
Working Stock A	0.40	5.0	0.1% Rat Albumin	HA3	0.20
Working Stock B	0.25	5.0	0.1% Rat Albumin	HB3	0.10

Target values are based on the theoretical values of ACHE. Adjustment to working stock A or working stock B will result in the same target concentrations.

C. Analysis of ACHE Standards

Once the standard solutions have been prepared they are analyzed to determine the actual slope of each standard curve. A new empty plate is used for this analysis. This plate is analyzed as a kinetic analysis at 435 nm for ten minutes at 37°C, see below for the analysis procedure. NOTE: because this analysis is a kinetic analysis no pre-read is needed.

1. 10 mcL of each standard is placed into 6 individual sample wells, each concentration should have an n=6. Add 10 mcL of pH 8 buffer to the plate blanks only; n=2.
2. Add 250 mcL of 0.65 mM DTNB solution to each sample well, plus 2 additional wells to serve as blanks.
3. Place the entire plate in an incubator (e.g., the instrument) at 37°C for approximately 10 minutes.
4. Remove the plate from the incubator and add 100 mcL of 3.5 mM ATC to all wells. Quickly place the plate in the plate reader and run a kinetic analysis for 10 minutes at a wavelength of 435 nm.
5. The instrument will collect the data and prepare a linear least squares regression table and generate a graph, a slope, an intercept and R^2 values. The acceptance criteria for the R^2 result is >0.975 , and the acceptance criteria for the slope is $310 \pm 10\%$.
6. If either the slope or the R^2 acceptance criteria are not met, then no more than 25% of the standards may be excluded (i.e. masked) and the slope and R^2 recalculated. If, after masking, the slope and/or the R^2 still do not meet the acceptance criteria, new standard(s) are prepared.

NOTE: for the analysis of the initial standard curve preparation, the slope of the standard curve may not meet acceptance criteria. This slope will be used only for the purposes of calculating the correction factor. When the adjusted standard curve is prepared using the correction factor, it must meet all acceptance criteria, otherwise it will be re-prepared.

D. Calculating the Correction Factor

In order to determine if the standard curve is producing a reliable result from one batch of standards to another, the slope of the L-Glutathione reference curve is compared to the slope of the enzyme standard curve.

1. The slope from the adjusted L-Glutathione reference curve is divided by the slope from the Acetylcholinesterase curve. If the number is less than 0.95 or greater than 1.05, adjust the stock preparations of Acetylcholinesterase by the calculated correction factor.

If the quotient is equal to or between 0.95 and 1.05, no adjustment to the stock enzyme solution is necessary. If the number is less than 0.95 or greater than 1.05, an adjustment is necessary.

Example:

Slope of Enzyme = 251

Slope of L-Glutathione curve (x1000) = 306

$306/251 = 1.219$

Note: At the discretion of the Study Director, additional slope adjustments may be made even if all other criteria are met. This additional adjustment is documented on the ACHE STANDARD PREPARATION form.

2. If the Correction Factor is required, new standards are prepared by adjusting the amount of stock enzyme used by the correction factor.

Example:

The previous example (section IV.B.2.) refers to 0.521 mL of 120.0192 U/mL stock solution for the working stock A. This value is adjusted by the 1.219 correction factor to be 0.635 mL for working stock A. Once the working stock solutions for both "A" and "B" have been adjusted all other dilution ratios are maintained. The new standards are recorded on the ACHE STANDARD PREPARATION form, which has the information for adjustment factor calculation and a place where the adjusted volumes can be calculated.

3. Once adjustments have been made to Working Stock Solution A and B, repeat the preparation of the enzyme standard curve as outlined in Sections IV.B.3. and IV.B.4.

V. SAMPLE PROCESSING

A. Brain Sample Processing

NOTE: all samples will be maintained on wet ice during processing. Once assayed, samples will be held refrigerated or on wet ice until the completion of analysis; they will then be transferred to frozen (-15°C to -30°C) storage.

1. The brain is transferred into an individual 15 mL polypropylene tube containing 7.5 mL of chilled 0.1% Tween[®] 80 buffer. The exact amount of buffer used will be documented in the raw data.
2. The brains will be homogenized with an OMNI TH tissue disperser/homogenizer using a 7 mm blade for approximately 1 minute at approximately 80% power or until an even homogenate is obtained. Samples will be kept on wet ice throughout the homogenization process.
3. The homogenate will be continuously mixed on a tube rotator on ice packs for at least five minutes. The time of mixing will be documented in the raw data.
4. The homogenate may be analyzed at this time without any further dilution based on expected results or they may be diluted and analyzed. However, if the initial homogenate produces a result above the limit of quantification (i.e. “high”), a secondary dilution should be documented and performed. The dilution will be performed by pipetting 0.250 mL of homogenate into an individual vial containing 0.750 mL of chilled 0.1% Tween[®] 80 buffer. However, if the diluted homogenate produces a result below the limit of quantification (i.e. “low”), the initial homogenate is to be reanalyzed in order to achieve an acceptable result.
5. If sample results are above the ULOQ or below the LLOQ, the diluted sample may be reanalyzed, the sample may be rediluted using the same dilution ratio or the dilution ratio may be adjusted with the permission of the Study Director. This will be documented in the raw data.
6. Sample results that are labeled by SoftMax as “No Fit” (unable to calculate the Vmax of the sample) will be reanalyzed.
7. Analyze the brain samples using the High Standard Curve according to

section VI below. Brain samples may be analyzed no more than three times to achieve an acceptable result; see section VIII.

B. Blood Processing

NOTE: all samples will be maintained on wet ice during processing. Once assayed, samples will be held refrigerated or on wet ice until the completion of analysis; they will then be transferred to frozen (-15°C to -30°C) storage.

1. One mL of whole blood will be transferred from the collection tube into an empty labeled vial for processing.
2. Centrifuge the sample for 10 minutes, at 2-8°C, at 2000-2500 rpm.
3. Remove the plasma from the packed red blood cell and discard. Store the packed RBCs on wet ice or refrigerated until the sample preparation described below can be performed.
4. The dilution is performed by transferring 0.040 mL of the RBCs into a vial containing 0.560 mL of 0.1% Tween[®] 80 buffer and mix well by inversion.
5. The sample will be sonicated using a Misonix sonicator[®] 3000. The sample will be sonicated for 5 seconds at a power setting of 0.5W (watts).
6. If sample results are above the ULOQ, an additional 1:2 dilution will be performed. If the sample results are below the LLOQ (i.e., “low”), the diluted sample will be reanalyzed for confirmation. If the second analysis confirms the “low” result, the extrapolated value will be used at the discretion of the Study Director. If the second analysis does not confirm the initial “low” result, the sample will be analyzed a third time. This will be documented in the raw data.
7. Sample results that are labeled by SoftMax as “No Fit” (unable to calculate the Vmax of the sample) will be reanalyzed.
8. Analyze the diluted RBC sample using the Low Standard Curve according to section VI below. RBC samples may be analyzed no more than three times to achieve an acceptable result; see section VIII below.

VI. PLATE SET-UP and INSTRUMENT PARAMETERS

A. Plate Set-Up (Note : all samples are to be mixed prior to analysis)

1. Standards, blanks and test samples are run in duplicate.
2. Place 0.010 mL (10 μ L) of each standard, reagent blank (pH8 buffer), or prepared test sample into two individual wells. The location of the sample is to be entered into the Softmax[®] template and verified. The Softmax[®] template will include the location of all standards, reagent blanks, and samples (sample addition will be documented on the Run Documentation Form).
3. Place 0.250 mL of 0.65mM DTNB into each well including the reagent blank well. DTNB addition is recorded on the Run Documentation Form.
4. Incubate the plate for approximately 10 minutes at 37°C in the SpectraMax 190. Incubation times are recorded on the Run Documentation Form.
5. The plate is removed from the instrument and 0.100 mL of 3.5mM ATC is added to all wells containing standards, samples, and reagent blanks. All wells will be checked for bubbles prior to returning the plate to the instrument for analysis. The run is then started by activating the READ icon. All sample analysis runs will be initiated within 5 minutes of the end of the pre-run incubation (section VI.A.4). ATC addition will be documented on the Run Documentation Form.

B. Instrument Parameters (Brain and RBC Analysis)Analysis Parameters for Brain and RBC Samples

PARAMETER	SETTING
Mode:	Kinetic
Run Time:	12 minutes (3 minute lag time)
Intervals:	15 seconds
Detection:	435nm
Auto-mix:	Before first read: Off Between Reads : Off
AutoCalibrate:	On
Strips:	Read entire plate
OD Min:	0.0 (1)
OD Max:	2.0 (1)
Incubator Temperature:	37°
Kinetic Reduction:	Vmax
Data Mode:	Absorbance
Display:	with reduced number

(1) The recommended Min and Max values may change based on response magnitude of response and or baseline drift.

VII. SAMPLE ANALYSIS

- A. Once the samples have been processed, they are analyzed by the SPECTRAmax 190 and recorded using Softmax[®] PRO 4.0 software according to the set-up parameters as outlined in Section VI above.
- B. Softmax[®] PRO 4.0 will automatically add a time and date stamp to each file as part of the file name. This will serve as the unique identifier of each analysis.

VIII. CALCULATIONS & ACCEPTANCE CRITERIA

A. Calculations

1. The kinetics are automatically reduced to a slope or a Vmax as reported by Softmax[®] PRO 4.0. Each plot is manually checked by the operator to ensure good kinetics, (i.e linear). Samples with results that are less than the Lower Limit of Quantification (LLOD) are documented in the raw data as “low”.
2. Softmax[®] PRO 4.0 calculates the actual concentration of the standards from the theoretical concentration in terms of Units per milliliter (U/mL). Theoretical concentrations for the standards are part of the Softmax[®] protocol file. These concentrations are calculated based on dilutions of prepared stocks.
3. Softmax[®] PRO 4.0 computes the un-weighted linear regression, relating the slopes of the standards to their respective enzyme concentrations, with the plate blank used.
4. Softmax[®] PRO 4.0 computes the correlation coefficient for the calibration curve.
5. Softmax[®] PRO 4.0 back calculates the concentration of the standards, determines the regression equation, and calculates the ACHE concentration of the test sample in terms of U/mL of enzyme.
6. All dilution information recorded during the sample preparation will be incorporated into the calculations of the final cholinesterase values.

B. Acceptance Criteria

1. The Correlation Coefficient (R^2) for the standard curve must be no less than 0.975. If the correlation coefficient is less than 0.975, then it is considered a failed run and all samples should be repeated.

2. Standard Curve

Each standard must replicate within $\pm 10\%$. The back-calculated concentrations of the calibration standards must be within $\pm 15\%$ [$\pm 20\%$ for concentrations less than or equal to 0.1 U/mL (high standard curve) or less than or equal to 0.015 U/mL (low standard curve)] of their theoretical concentrations. Standards that do not meet the appropriate criteria may be excluded by masking, as long as no more than 25% of the standards are “masked” (dropped). The LLOQ and ULOQ are then re-defined by *Softmax*[®] Pro according to the remaining standards.

The slope of the standard curve at the 37°C assay temperature will be 310 \pm 10%.

3. Sample Replication

All samples are analyzed in duplicate. Brain sample duplicates must replicate within 80% of each other in order to be accepted. RBC sample duplicates must replicate within 75% of each other in order to be accepted. Samples that do not meet this criteria are labeled by *Softmax*[®] Pro as “DNR” (Does Not Replicate) and the sample should be reanalyzed. (NOTE: Samples labeled as “No Fit” will also be labeled as “DNR”). Samples should not be repeated more than two additional times (including “No Fits”). If there is insufficient sample to be re-analyzed, then the results are footnoted.

4. Samples that are below the LLOQ, are labeled “low”. Any samples that have been labeled as “low” are to be repeated; these samples should not be analyzed more than three times in total.
5. Samples that are above the ULOQ for the assay are labeled as “high”. Any sample that generates a “high” result may be re-analyzed or diluted as described in section V above, then re-analyzed. Diluted samples which produce unacceptable results may be analyzed up to three times.

IX. DATA COLLECTION AND FINAL REPORTING

A. Data Collection

1. Data Files:

Once a set has been analyzed it is automatically saved into the appropriate study file on the network (see preference function in the edit menu). Once the data file has been saved the file is printed and initialed and dated as raw data.

2. Exported Data:

Once the data has been saved and printed it is exported into an Excel format. This is done by selecting the appropriate *Softmax*[®] file and selecting the export function under the “File” menu. Files are exported as text files with the “Groups” option selected. This provides an excel format which allows for post calculation data to be entered, (e.g., group, age, sex and time variables from the protocol). This information is obtained from the in-life data.

B. Retest Criteria

1. Any initial acceptable sample may be re-tested as long as the rationale for testing is documented in the General Comments and is subsequently approved by the Study Director (retesting is done after an initial result has been acquired, and may be done in addition to the three analyses limit).
2. Any sample that is retested must generate acceptable results (based on SOFTMax[®] PRO 4.0 Acceptance Criteria).
 - a. If the acceptable result is less than or equal to $\pm 25\%$ of the original sample, then the original sample is considered “confirmed” and is used (the second sample result is reported but not used in the group averages).
 - b. If the acceptable result is greater than $\pm 25\%$ of the original sample, then the original sample is considered “contradicted” and a third analysis will be conducted.

- c. If the third analysis is less than or equal to $\pm 25\%$ of the original sample, then the original sample is considered "confirmed" and is used in the group average (the second and third sample results are reported but not used in the group averages). If the third analysis is less than or equal to $\pm 25\%$ of the second analysis, then the second analysis is considered "confirmed" and is used in the group average (the first and the third sample results are reported but not used in the group averages).
- d. If neither the first analysis nor the second analysis is confirmed, then all data will be reported but none of the results from this sample will be used in the group average.

X. REFERENCES

1. Ellman, G.L., Courtney, K.D., Andres, V.Jr. and Featherstone, R.M. (1961). A new and rapid colorimetric determination of acetylcholinesterase activity. *Biochem Pharmac.*, 7, 88-95
2. Lawson, A.A. and Barr, R.D. (1987) Acetylcholinesterase in red blood cells. *American Journal of Hematology*, 26, 101-112.

Prepared by:

Melissa A. Snyder

Date:

11 Jan 2011

Calculations

Recalculated by:

John J. Gilchrist

Date:

11 Jan 2011Verified and
Approved by:John J. Gilchrist ①

Date:

11 Jan 2011 ①John J. Barnett11 Jan 2011

① I correct entry JBJ 11 Jan 2011

REAGENT PREPARATION PROCEDURES

Below lists the general procedures to be followed when preparing reagents for cholinesterase analysis. The preparation size may be adjusted as necessary to prepare the correct volume needed for the assay, as long as the proportions are maintained. All reagents will be stored refrigerated when not in use.

A. PREPARATION OF GENERAL REAGENTS (expiration is one month from prep date)

1. 0.1M DIBASIC SODIUM PHOSPHATE BUFFER (a.k.a. 0.1M Dibasic)

Dissolve 14.2 ± 2 g dibasic sodium phosphate in 1L water.

2. 0.1M MONOBASIC SODIUM PHOSPHATE BUFFER (a.k.a. 0.1M Monobasic)

Dissolve 13.8 ± 2 g monobasic sodium phosphate in 1L water.

3. 0.1M SODIUM PHOSPHATE BUFFER, pH 8 (a.k.a. pH8 or pH8 buffer)

Combine 0.1M dibasic sodium phosphate buffer with 0.1M monobasic sodium phosphate buffer (95:5, v: v).

4. 0.1% TWEEN[®] 80 BUFFER (a.k.a. 0.1% Tween or 0.1% Tween buffer)

Transfer 1.0mL Tween[®] 80 into a 1L volumetric flask and bring to volume with 0.1M sodium phosphate buffer, pH 8

5. 0.1% RAT ALBUMIN BUFFER (a.k.a. 0.1% RA or 0.1% RA buffer)

Dissolve 1g rat albumin, fraction V, in 1L 0.1% Tween[®] 80 buffer.

B. PREPARATION OF CRITICAL REAGENTS (expiration is on the day of preparation)

1. 0.65mM DTNB

Dissolve 25.76 ± 2 mg of DTNB for each 100mL of 0.1M of sodium phosphate buffer, pH 8 buffer used. Use a volumetric flask to q.s. to the final volume and mix well.

2. 3.5mM ATC

Dissolve 50.61 ± 2 mg of ATC iodide for each 50 mL of 0.1M of sodium phosphate buffer, pH 8 buffer used. Use a volumetric flask to q.s. to the final volume and mix well.

ATTACHMENT 5 -
TISSUES TO BE WEIGHED AND RETAINED FOR POSSIBLE EXAMINATION
AND HISTOLOGICAL EVALUATION

ATTACHMENT 5 -**TISSUES TO BE WEIGHED AND RETAINED FOR POSSIBLE EXAMINATION**

Representative samples of the tissues identified in the Tissue Collection and Preservation table will be collected from all rats assigned to the main study and preserved in 10% neutral buffered formalin, unless otherwise indicated. Additional tissue samples may be collected at the discretion of the pathologist to elucidate abnormal findings.

Tissue Collection and Preservation

Tissue	Weigh	Collect	Microscopic Evaluation	Comment
Animal identification	-	X	-	-
Artery, aorta	-	X	X	From thoracic segment.
Bone marrow smear	-	X	X	Two smears will be collected per animal. Bone marrow smears will be collected from the sternum at scheduled and unscheduled necropsies for examination. Smears will not be collected from animals that are found dead. Bone marrow smears are allowed to air dry and are not fixed in formalin.
Bone, femur	-	X	X	Collect distal end to include femoral tibial joint
Bone, sternum	-	X	X	-
Brain	X	X	X	Forebrain, midbrain, cerebellum, and medulla oblongata.
Cervix	X	X	X	Collect and weigh with uterus.
Epididymis	X	X	X	Paired weight and examination.
Esophagus	-	X	X	-
Eye	-	X	X	Paired examination; Preserve in Davidson's fixative (euthanized animals only), rinsed and transferred to 10% neutral buffered formalin.
Gland, adrenal	X	X	X	Paired weight and examination.
Gland, harderian	-	X	X	Paired examination. Collect with eye (reserve in Davidson's fixative (euthanized animals only), rinsed and transferred to 10% neutral buffered formalin.
Gland, mammary	-	X	X	Collect with inguinal skin. (Mammary gland will be collected and examined in the female rats).
Gland, parathyroid	-	X	X	Collect with thyroid: Examine only if present in the routine section of thyroid.
Gland, pituitary	-	X	X	-
Gland, prostate	-	X	X	-
Gland, salivary	-	X	X	Submandibular.
Gland, seminal vesicle with coagulating gland	-	X	X	-
Gland, thyroid	-	X	X	-
Gross lesions/masses	-	X	X	-

Tissue	Weigh	Collect	Microscopic Evaluation	Comment
Gut-associated lymphoid tissue	-	X	X	Collect with small intestine.
Heart	X	X	X	-
Kidney	X	X	X	Paired weight and examination.
Large intestine, cecum	-	X	X	-
Large intestine, colon	-	X	X	-
Large intestine, rectum	-	X	X	-
Liver	X	X	X	-
Lung	-	X	X	Infuse with 10% neutral buffered formalin after weighing.
Lymph node, mandibular	-	X	X	-
Lymph node, mesenteric	-	X	X	-
Muscle, skeletal	-	X	X	From thigh.
Nasal Passages	-	X	X	Collect with sinuses.
Nerve, optic	-	X	X	Preserve in Davidson's fixative (euthanized animals only); rinsed and transferred to 10% neutral buffered formalin. Examine only if present in the routine section of the eye.
Nerve, sciatic	-	X	X	-
Ovary	X	X	X	Paired weight and examination.
Oviduct	X	X	X	Collect and weigh with uterus.
Pancreas	-	X	X	-
Rectum	-	X	X	-
Skin	-	X	X	Collect with mammary gland.
Small intestine, duodenum	-	X	X	-
Small intestine, ileum	-	X	X	-
Small intestine, jejunum	-	X	X	-
Spinal cord	-	X	X	Cervical, thoracic, lumbar.
Spleen	X	X	X	-
Stomach	-	X	X	Glandular and nonglandular regions.
Testis	X	X	X	Paired weight and examination; Preserve in Modified Davidson's fixative (euthanized animals only), rinsed and transferred to 10% neutral buffered formalin.
Thymus	X	X	X	-
Tongue	-	X	X	Collect with larynx and pharynx.
Trachea	-	X	X	-
Ureter	-	X	X	-
Urinary bladder	-	X	X	-
Uterus	X	X	X	-
Vagina	-	X	X	-

X = procedure to be conducted; - = not applicable.

Bone Marrow Smear Evaluation

Bone marrow smears will be collected as described in the Tissue Collection and Preservation table. All bone marrow smears will be shipped unstained and uncoverslipped to the Principal Investigator at the Test Site (see Shipping Instructions Bone Marrow Smears).

Bone marrow cytologic preparations will be evaluated, and a myeloid:erythroid ratio will be determined and quantified for each animal. Lymphocytes will be counted and presented as a percentage of cells per 200 myeloid and erythroid cells counted. In addition, the bone marrow smears will be evaluated for morphologic or maturation abnormalities.

Histology

Tissues will be processed at Charles River Laboratories, Pathology Associates, Maryland. Tissues in the Tissue Collection and Preservation table will be processed, embedded in paraffin, sectioned, mounted on glass slides, and stained with hematoxylin and eosin.

Histopathology

All gross lesions will be examined histologically.

Histopathological evaluation will be performed by a board-certified veterinary pathologist. Tissues identified as target tissues will be examined from animals in the control and high test substance concentration exposure groups.

In addition, tissues that include the nasal cavity and turbinates will be trimmed, embedded in paraffin, sectioned, mounted on glass slides, and stained with Hematoxylin and eosin. The nasal tissue will be trimmed consistent with the procedures described by Young¹⁵. In addition to the four routine sections delineated by Young, the most rostral section of the nose, to include nares, will also be examined microscopically by the Principal Investigator for histopathology.

If lesions attributed to the test substance by the Study Director and/or Veterinary Pathologist are observed in the rats exposed to the high substance article concentration, the same organs will be examined histologically in the rats exposed to the lower test substance concentrations. Should results from the control and high dosage groups warrant examination of the lower dosage groups and conduct of the quantitative evaluation, scheduled report dates will be adjusted accordingly. Additional costs will be incurred should these evaluations be required.

At the discretion of the study pathologist, images may be captured for illustration of or consultation on microscopic findings. Generation of such images will be documented and communicated to the study director. Images and associated documentation will be retained and archived.

Any additional stains or evaluations, if deemed necessary by the pathologist, will be added by protocol amendment following discussion with the Study Director and in consultation the Sponsor.

Shipping Instructions (Tissues):

Tissues for histological processing will be sent (ambient conditions) to:

Daniel MacDonald
Manager, Archive/Repository
Charles River Laboratories, Pathology Associates, Maryland
15 Worman's Mill Court, Suite I
Frederick, MD 21701
USA
Tel: 301.624.2022
Fax: 301.695.9850
E-Mail: daniel.macdonald@crl.com

The recipient will be notified in advance of sample shipment.

Following histological processing, all slides will be sent to the Principal Investigator, for histopathological evaluation. The Principal Investigator of the evaluation will be Carol J. Detrisac, DVM, PhD, DACVP. Dr. Detrisac's contact information is as follows:

Principal Investigator: Carol J. Detrisac, DVM, PhD, DACVP
Charles River Laboratories, Pathology Associates, Illinois
2255 W. Harrison Street
Chicago, IL 60612
USA
Main Tel: 312.666.1555
Direct Tel: 312.567.4876
Fax: 312.666.1764
Direct Fax: 312.567.4888
E-mail: carol.detrisac@crl.com

The recipient will be notified in advance of sample shipment.

All slides residual wet tissue, blocks, histology data, and the report will be returned to Charles River Laboratories, Preclinical Services, Pennsylvania for archiving at the completion of the study.

Shipping Instructions (Bone Marrow Smears):

All unstained and uncoverslipped bone marrow slides will be sent to the Principal Investigator, for cytologic evaluation. The Principal Investigator of the bone marrow smear evaluation will be Angela Wilcox, BVSc, MS, DACVP. Dr. Wilcox's contact information is as follows:

Principal Investigator: Angela Wilcox, BVSc, MS, DACVP
Charles River Laboratories, Preclinical Services, Reno
6995 Longley Ln
Reno, NV 89511
USA
Tel: 775.682.2197
Fax: 775.682.2105
E-mail: angela.wilcox@crl.com

The recipient will be notified in advance of sample shipment.

All bone marrow slides, and the report will be returned to Charles River Laboratories, Preclinical Services, Pennsylvania for archiving at the completion of the study.



Protocol Amendment No. 1

Oral (Diet) Repeated Dose 90-Day Toxicity Study of Malathion Technical in Rats

Testing Facility Study No. TQC00066

Note: Additions are indicated in bold text. Deletions are indicated in strikethrough text.

1. Section 12. Analyses

The third paragraph in this section will be revised as follows:

Before initiation of dosage, the homogeneity and concentration of the prepared formulations (diets) will be verified. Results of the homogeneity and concentration analyses of the first test substance diet preparation to be used during the study will be approved by the Study Director before administration. Thereafter, the concentration of the formulations (diets) will be verified **from preparations for Weeks 1, 3, 5, 9 and 13** ~~on a monthly basis~~ and the study director will approve each of the formulations (diets) prior to use. The study monitor will be notified of any deviations.

Justification:

This clarifies when the prepared diets will be analyzed for concentration and homogeneity.

2. Section 12.3.1. Concentration and Homogeneity

The second paragraph in this section will be revised as follows:

Concentration of the prepared diets will be verified during the course of this study according to a validated method (analytical procedure MALA02). Duplicate samples (25 g each) from each concentration will be taken from each preparation. All samples will be transferred to the analytical laboratory at the Testing Facility. One sample of each set ~~will be analyzed in duplicate~~ **from preparations for Weeks 1, 3, 5, 9 and 13 will be analyzed in duplicate.** The remaining samples will be retained refrigerated (2°C to 8°C), protected from light at the Testing Facility as backup samples. **Samples collected during the intermediary periods will be stored refrigerated (2°C to 8°C), protected from light and will not be analyzed unless directed by the Study Director.**

Justification:

This clarifies when the prepared diets will be analyzed for concentration and homogeneity.

3. Section 21.4.1 Rats Assigned to the Cholinesterase Assay

Male and female rats assigned for cholinesterase assay will be sacrificed following the last day of test diet exposure (DS 91) as described in Section 21.1 (Method of Sacrifice) and evaluated as described in Section 20 (Cholinesterase Assay). **A gross necropsy of the thoracic, abdominal and pelvic viscera will be performed.**

Justification:

This provides directive for necropsy procedures to be followed for rats assigned to the cholinesterase assay.

4. Attachment 5 - Tissues to be Weighed and Retained for Possible Examination and Histological Evaluation - Tissue Collection and Preservation Chart

- The lungs will be weighed.
- For gland, harderian, the comment is revised to “Collect with eye (**Preserve** ~~reserve~~ in Davidson’s fixative (euthanized animals only), rinsed and transferred to 10% neutral buffered formalin.”
- For skin, the comment “Collect with mammary gland” will be removed from the protocol.

Justification:

This provides clarification regarding items in the tissue collection and preservation chart.

5. Attachment 5 - Tissues to be Weighed and Retained for Possible Examination and Histological Evaluation - Histology and Histopathology**Histology**

Tissues that include the nasal cavity and turbinates will be processed for Main Study rats from all exposure Groups (I, II, III, IV, and V) and all other tissues from Main Study rats assigned to Groups I and V (control and high, respectively) will be processed at Charles River Laboratories, Pathology Associates, Maryland. Tissues in the Tissue Collection and Preservation table will be processed, embedded in paraffin, sectioned, mounted on glass slides, and stained with hematoxylin and eosin.

Histopathology

All gross lesions will be examined histologically.

Histopathological evaluation will be performed by a board-certified veterinary pathologist. Tissues ~~identified as target tissues~~ will be examined from animals in the control and high test substance concentration exposure groups.

In addition, tissues that include the nasal cavity and turbinates will be trimmed, embedded in paraffin, sectioned, mounted on glass slides, and stained with Hematoxylin and eosin. The nasal tissue will be trimmed consistent with the procedures described by Young¹⁵. In addition to the four routine sections delineated by Young, the most rostral section of the nose, to include nares, will also be examined microscopically by the Principal Investigator for histopathology.

Histological examination will be performed on all Main Study rats assigned to exposure Groups I and V (control and high, respectively) and the nasal cavity and turbinates from all exposure Groups (I, II, III, IV, and V). If lesions attributed to the test substance by the Study Director and/or Veterinary Pathologist are observed in the rats exposed to the high substance article concentration, the same organs will be examined histologically in the rats exposed to the lower test substance concentrations. Should results from the control and high dosage groups warrant examination of the lower dosage groups and conduct of the quantitative evaluation, scheduled report dates will be adjusted accordingly. Additional costs will be incurred should these evaluations be required.

At the discretion of the study pathologist, images may be captured for illustration of or consultation on microscopic findings. Generation of such images will be documented and communicated to the study director. Images and associated documentation will be retained and archived.

Any additional stains or evaluations, if deemed necessary by the pathologist, will be added by protocol amendment following discussion with the Study Director and in consultation the Sponsor.

Justification:

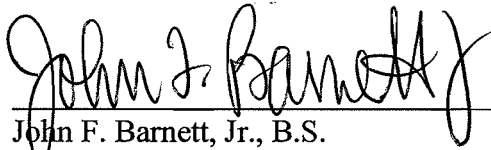
This provides clarification regarding tissue processing and histopathological evaluations to be performed.

Protocol Amendment No. 1

Page 4

Testing Facility Study No. TQC00066

Amendment Approval:



John F. Barnett, Jr., B.S.
Senior Research Scientist
Study Director

Date: _____

25 Feb 2011

Protocol Amendment No. 1

Page 5

Testing Facility Study No. TQC00066

Sponsor Approval:



M. Jensen
Study Monitor

Date: 9 March, 2011



Protocol Amendment No. 2

**Oral (Diet) Repeated Dose 90-Day Toxicity Study of Malathion
Technical in Rats**

Testing Facility Study No. TQC00066

Note: Additions are indicated in bold text. Deletions are indicated in strikethrough text.

1. Attachment 5 - Tissues to be Weighed and Retained for Possible Examination and Histological Evaluation - Tissue Collection and Preservation Chart; and Amendment 1, Item 5

- The prostate gland, the thyroid gland (fixed weight; paired weight and examination; weight includes parathyroid) and the seminal vesicle gland with the coagulating gland will be weighed, as well as collected and examined microscopically.
- For main study animals, the brain weight will be recorded to three decimal places.

Justification:

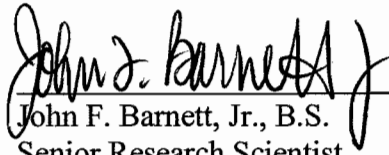
At the request of the Sponsor, organ weights will be collected.

Protocol Amendment No. 2

Page 2

Testing Facility Study No. TQC00066

Amendment Approval:



John F. Barnett, Jr., B.S.
Senior Research Scientist
Study Director

Date: 15 Apr 2011

Protocol Amendment No. 2

Page 3

Testing Facility Study No. TQC00066

Sponsor Approval:



M. Jensen
Study Monitor

Date: 19 April 2011



Protocol Amendment No. 3

**Oral (Diet) Repeated Dose 90-Day Toxicity Study of Malathion
Technical in Rats**

Testing Facility Study No. TQC00066

Note: Additions are indicated in bold text. Deletions are indicated in strikethrough text.

**1. Attachment 5 - Tissues to be Weighed and Retained for Possible Examination
and Histological Evaluation - Tissue Collection and Preservation Chart**

The comment for the Bone marrow smear in the Tissue Collection and Preservation chart will be revised to the following:

Two smears will be collected per animal (**in duplicate**). Bone marrow smears will be collected from the sternum at scheduled and unscheduled necropsies for examination. Smears will not be collected from animals that are found dead. Bone marrow smears are allowed to air dry and are not fixed in formalin.

Justification:

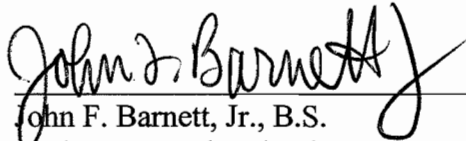
This clarifies the process for bone marrow collection.

Protocol Amendment No. 3

Page 2

Testing Facility Study No. TQC00066

Amendment Approval:



John F. Barnett, Jr., B.S.
Senior Research Scientist
Study Director


Date: 18 Apr 2011

Protocol Amendment No. 3

Page 3

Testing Facility Study No. TQC00066

Sponsor Approval:



M. Jensen
Study Monitor

Date: 19. April, 2011



Protocol Amendment No. 4

**Oral (Diet) Repeated Dose 90-Day Toxicity Study of Malathion
Technical in Rats**

Testing Facility Study No. TQC00066

Note: Additions are indicated in bold text. Deletions are indicated in strikethrough text.

**1. Attachment 5 - Tissues to be Weighed and Retained for Possible Examination
and Histological Evaluation - Tissue Collection and Preservation Chart;
Amendment No. 3**

The Principal Investigator will perform a qualitative histopathological evaluation of the bone marrow from the femur from the control and the high dosage group rats. "Bone marrow, femur" will be added to the Tissue Collection and Preservation chart.

Justification:

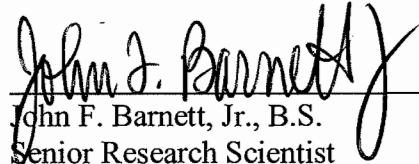
Following preliminary review by the Principal Investigator of the sternum bone marrow smears, it was determined that many smears were of insufficient cellularity for proper evaluation due to slide preparation inconsistencies; therefore, bone marrow will be evaluated in the histologic section of the femur.

Protocol Amendment No. 4

Page 2

Testing Facility Study No. TQC00066

Amendment Approval:



John F. Barnett, Jr., B.S.
Senior Research Scientist
Study Director

Date:

07 June 2011

Protocol Amendment No. 4

Page 3

Testing Facility Study No. TQC00066

Sponsor Approval:



M. Jensen
Study Monitor

Date: 9. June, 2011

**APPENDIX 2 - DEVIATIONS FROM THE PROTOCOL AND THE STANDARD
OPERATING PROCEDURES OF THE TESTING FACILITY**

DEVIATIONS FROM THE PROTOCOL AND STANDARD OPERATING PROCEDURES OF THE TESTING FACILITY

There were no deviations that affected the outcome or interpretation of this study. All deviations that occurred on this study were incidental in nature as they were documentation or recording errors, minimal excursions from specific data collection endpoints (e.g., safety procedures, sampling transfer, animal husbandry procedures, clinical observations, detailed clinical observations, feed values, viabilities, cholinesterase evaluations, etc.) or minor procedural errors that deviated from original intent of the experimental design. These types of deviations from the protocol had no impact on the study outcome or interpretation of the data because, relative to the total number of rats evaluated and/or the number of data points collected per parameter, the deviations were not significant. Each deviation is listed below.

Formulations

The bulk test substance was not handled in a chemical fume hood, nor was the test substance preparation conducted in a chemical fume hood. This deviation does not affect the outcome of the study because the proper safety attire was worn while preparing the diet.

Samples for dose formulation analysis were not transferred to the analytical laboratory at the Testing Facility on the date of preparation; the samples were properly stored between the time of sampling and transfer to the analytical laboratory.

On DS 43 (01 March 2011), the batches of feed that were documented as fed to the male rats in Group 1 through V (replicate 1, main study) did not indicate which concentrations (i.e., A through E) were provided and on DS 78 through 81 (05 April 2011 through 08 April 2011) the batches of feed that were documented as fed to all male and female rats did not indicate the date of preparation. This deviation did not impact the outcome of the study because it is presumed that the appropriate batches of feed were fed to the rats; however, a documentation error prevented this from being reflected in the data.

On 08 March 2011, it was not documented on the EGC sheet for verification of filling feed jars that the formulated diets equilibrated to ambient temperature prior to use and jar filling. This deviation did not impact the outcome of the study because this was a documentation error and it is presumed that the technician completed this task.

The analytical results (10 March 2011 and 08 April 2011) were not reviewed and documentation was not provided of the review prior to the preparations being used on study. This deviation did not impact the outcome of the study because each preparation was acceptable for usage on study.

On 14 April 2011 and 15 April 2011, the lot of feed recorded as provided to all female rats assigned to Replicate 4 (main study) and Replicate 6 (cholinesterase subset) was outside of the stability of the test substance; however, based on the feed

data and the formulations data, it is presumed that the 08 April 2011 lot was provided to the rats. This deviation did not impact the outcome of the study because it is presumed that the appropriate lot of feed within the stability parameters was fed to the rats; however, a documentation error prevented this from being reflected in the data.

Safety

On 17 January 2011, 26 January 2011, 24 February 2011, 10 March 2011, 24 March 2011, and 08 April 2011, it was not documented that following handling of the test substance gloves were washed with soap and water or sprayed with an appropriate cleaning solution prior to removal and then disposed of in a biohazard container.

Animal Husbandry

On the morning of 13 January 2011, it was discovered that, all PO rats housed on rack 178 did not have access to water due to a waterline malfunction from 11 January 2011 through 13 January 2011. The waterline was replaced on 13 January 2011. This deviation does not adversely affect the outcome of the study because the access to water occurred during the acclimation period, sufficient time was allowed prior to assignment to study, and the animals were evaluated to ensure that their health was maintained.

In-life Observations, Measurements, and Evaluations

On DS 1 (18 January 2011), male rat 18077, assigned to study as a replacement rat in the 10000 ppm exposure group (main study; replicate 1), did not receive a detailed clinical observation prior to initiation of exposure.

On DS 13 and DS 45 (31 January 2011 and 11 March 2011), male rats 3706 through 3710 in the 10000 ppm exposure group (main study; replicate 2) and male rats 3766 through 3771 in the 5000 ppm exposure group (cholinesterase subset; replicate 5), respectively, did not receive a clinical observation.

On DS 14 (3 February 2011), all female rats assigned to replicate 4 (main study) received two feed values in a one week period.

On the following dates during the exposure period, afternoon viabilities were not recorded for all male and female rats assigned to study: 2 February 2011, 17 April 2011, and 20 April 2011; however, all rats were alive the following day. In addition, morning viabilities were not recorded for all male and female rats assigned to study on 30 March 2011 and 23 April 2011; however, all rats were alive at the afternoon viability check.

On DS 22 (16 February 2011), an edit to the data was performed incorrectly prior to the printout being printed for male rat 3797 in the 0 (Carrier Control) ppm (cholinesterase subset; replicate 5) exposure group. As a result, the original feed value for this male rat was lost.

Male rat 3731 (Group II; 100 ppm) was found with a feed jar labeled with the Group IV (5000 ppm) identification rather than the Group II identification on DS 29 (16 February 2011) (main study; replicate 2); female rat 3951 (Group IV; 5000 ppm) was found with a feed jar labeled with the Group II (100 ppm) identification rather than the Group IV identification on DS 29 (17 February 2011) (main study; replicate 3); and female rat 3961 (Group IV; 5000 ppm) was found with a feed jar labeled with the Group V (10000 ppm) identification rather than a Group IV identification on DS 22 (17 February 2011) (cholinesterase subset; replicate 6). This deviation did not impact the outcome of the study because a review of the clinical signs, body weights and feed consumption data did not reveal any scientific evidence that the rats were exposed to the incorrect concentration of the prepared diet. In addition, this error affected a minimal number of rats and a minimal number of endpoints during the course of this 90-day study.

On DS 56 (14 March 2011 and 15 March 2011), detailed clinical observations were not documented as having been conducted blind to dosage groups for male rats.

Ophthalmological evaluations performed prior to assignment to study on 14 January 2011 (pre-exposure period), and prior to scheduled sacrifice on DSs 84 through 87 (14 April 2011), were conducted by Michael H. Brown, DVM, MS, DACVO, rather than Lionel F. Rubin, V.M.D. This deviation does not adversely impact the outcome of the study because Dr. Brown is capable of performing compatible evaluations.

On DS 57 (18 March 2011), a feed left value was not recorded for female rat 3931 in the 500 ppm exposure group (main study; replicate 4).

On 12 April 2011 (male rats) and 13 April 2011 (female rats), detailed clinical observations were performed on DS 77 (Week 11) rather than on DS 78 (Week 12) for all male and female rats assigned to the cholinesterase subset.

Cholinesterase Evaluations

On DS 91, 26 April 2011, RBC sample analysis was not performed for the following male rats in the cholinesterase subset (replicate 5): 3796 in the 0 (Carrier Control) exposure group, 3746 in the 100 ppm exposure group, 3821 in the 500 ppm exposure group, 3771 in the 5000 exposure group, and 3719 and 3721 in the 10000 ppm exposure group. The samples were received and diluted per protocol. This deviation does not adversely affect the outcome of the study because sufficient samples were analyzed for summarization and analyses.

On DS 91, 27 April 2011, an additional RBC analysis was performed for female rats 3975 in the 5000 ppm exposure group (cholinesterase subset; replicate 6) and 3894 in the 10000 ppm exposure group (cholinesterase subset; replicate 6) after an acceptable result was obtained without documentation of rationale for retesting or approval by the Study Director. This deviation does not impact the outcome of the study because the retest was required to verify the results of the initial analyses.

On DS 91, 26 April 2011 and 27 April 2011, several brain and RBC samples were not analyzed within 90 minutes of sacrifice. The range of time deviated for brain samples was from 1 minute to 223 minutes late, and the range of time deviated for RBC samples was from 1 minute to 155 minutes late. This deviation did not impact the outcome of the study because the samples were analyzed as soon as possible and the slight time difference is not expected to affect the results.

On DS 91, 26 April 2011 and 27 April 2011, the brain sample homogenate was continuously mixed on ice packs for 4 minutes rather than at least 5 minutes for male rat 3788 in the 0 (Carrier Control) exposure group (cholinesterase subset; replicate 5) and female rats 3942 in the 500 ppm exposure group (cholinesterase subset; replicate 6) and 3970 in the 5000 ppm exposure group (cholinesterase subset; replicate 6), respectively. This deviation does not impact the outcome of the study because the samples were mixed for a sufficient amount of time prior to evaluation.

On DS 91, 26 April 2011, sample batch TQC00066M-4 4-26-2011 135649.pda was initiated 6 minutes after the incubation period rather than 5 minutes. In addition, the sample locations for this plate were inadvertently not confirmed. This deviation did not impact the outcome of the study because the additional minute of incubation is not presumed to have any effect on the samples. Also, the confirmation of the place was a recording error and no raw data were lost.

A low curve calibration standard at a target concentration of 0.0075 U/mL (LA4) was not prepared. Low curve calibration standards at target concentrations of 0.150, 0.100, 0.070, 0.050, 0.030, and 0.015 U/mL were prepared for use on study. This deviation does not adversely impact the outcome of the study because the appropriate standards were available for analyses.

On DS 91, 27 April 2011, batch TQC00066F-6 4-27-11 152951.pda was inadvertently initiated 6 minutes after the incubation rather than 5 minutes. This deviation did not impact the outcome of the study because this one minute delay is not expected to impact the cholinesterase results.

Terminal Procedures

On DS 91 (18 April 2011), the bone (sternum) was inadvertently discarded after bone marrow slides were made for male rats 3776 through 3780 in the 0 (Carrier Control) ppm exposure group, 3726 through 3730 in the 100 ppm exposure group, 3801 through 3805 in the 500 ppm exposure group, 3751 through 3755 in the 5000 ppm exposure group, and 3701, 18077, 3703, 3704, and 3705 in the 10000 ppm exposure group. These rats were assigned to the main study (replicate 1). This deviation does not adversely impact the outcome of the study because a sufficient number of bone (sternum) samples are available for evaluation.

All deviations are documented in the raw data.

APPENDIX 3 - CERTIFICATES OF ANALYSIS



Cheminova A/S
P.O. Box 9
DK-7620 Lemvig
Denmark

Phone (+45) 96 90 96 90
Fax (+45) 96 90 96 91
www.cheminova.com
CVR-No. DK12 76 00 43

Certificate of Analysis

TEM 010-08

Test substance certified:

Test substance:	Malathion Technical fortified			
CHA Code No.:	-			
Batch No.:	D2014-OSJ-MLT-01-S			
Origin of test substance:	<input checked="" type="checkbox"/> Laboratory	<input type="checkbox"/> Pilot plant	<input type="checkbox"/> Commercial	

Analysis:

Content of Malathion:	95.8% w/w
Identified by:	¹ H-NMR and ¹³ C-NMR Spectroscopy, Mass Spectrometry and IR Spectroscopy
Quantified by:	GC (Method VAM 001-02)
Date of analysis:	September 28, 2010

Information of the test substance:

Appearance:	Pale yellowish liquid
Storage:	Refrigerator
Tap density:	Not determined
Expiry date:	September 28, 2013

Information of analyte(s):

Common name:	Malathion
CAS name:	Butanedioic acid ((dimethoxyphosphino-thioyl) thio)-, diethyl ester
CAS No.:	121-75-5
Molecular formula:	C ₁₀ H ₁₉ O ₆ PS ₂
Molecular mass:	330.36 g/mol
Structure formula:	

Statement of GLP Compliance

The identification and quantification were performed at Cheminova A/S and conducted according to FIFRA Good Laboratory Practice Standards, 40 CFR Part 160 and the OECD Principles of Good Laboratory Practices.

Date

November 9, 2010

Barbara Hinz



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P.O. Box 9
DK-7620 Lemvig
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CVR-No. DK 12 76 00 43

Certificate of Analysis

TEM 010-08

Content of impurities and information of analyte(s):

Common name:	Isomalathion
Content:	0.39% w/w
Identified by:	UV Spectroscopy
Quantified by:	HPLC (Method VAM 005-04)
Date of analysis:	September 14, 2010
CAS name:	Butanedioic acid, 2-[[methoxy(methylthio)phosphinyl]thio]-, 1,4-diethyl ester
CAS No.:	3344-12-5
Molecular formula:	C ₁₀ H ₁₉ O ₆ PS ₂
Structure formula:	
Molecular mass:	330.36 g/mol
Common name:	Malaoxon
Content:	0.073% w/w
Identified by:	UV Spectroscopy
Quantified by:	HPLC (Method VAM 008-03)
Date of analysis:	September 23, 2010
CAS name:	Butanedioic acid, [[dimethoxyphosphinyl]thio]-, diethyl ester
CAS No.:	1634-78-2
Molecular formula:	C ₁₀ H ₁₉ O ₇ PS
Structure formula:	
Molecular mass:	314.29 g/mol

Statement of GLP Compliance

The identification and quantification were performed at Cheminova A/S and conducted according to FIFRA Good Laboratory Practice Standards, 40 CFR Part 160 and the OECD Principles of Good Laboratory Practices.

Date

November 9, 2010

Barbara Hinz



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CVR-No. DK 12 76 00 43

Certificate of Analysis

TEM 010-08


Common name:	MeOOOPS-triester
Content:	0.50% w/w
Identified by:	Mass Spectrometry (GC/MS)
Quantified by:	GC (Method VAM 130-01)
Date of analysis:	August 20, 2010
CAS name:	Phosphorothioic acid, O,O,O-trimethyl ester
CAS No.:	152-18-1
Molecular formula:	C ₃ H ₉ O ₃ PS
Structure formula:	$\begin{array}{c} \text{H}_3\text{C}-\text{O}-\text{P}(=\text{S})-\text{O}-\text{CH}_3 \\ | \\ \text{H}_3\text{C}-\text{O}-\text{P}-\text{O}-\text{CH}_3 \end{array}$
Molecular mass:	156.14 g/mol
Common name:	MeOOSPS-triester
Content:	1.72% w/w
Identified by:	Mass Spectrometry (GC/MS)
Quantified by:	GC (Method VAM 130-01)
Date of analysis:	August 20, 2010
CAS name:	Phosphorodithioic acid, O, O, S-trimethyl ester
CAS No.:	2953-29-9
Molecular formula:	C ₃ H ₉ O ₂ PS ₂
Structure formula:	$\begin{array}{c} \text{H}_3\text{C}-\text{O}-\text{P}(=\text{S})-\text{S}-\text{CH}_3 \\ | \\ \text{H}_3\text{C}-\text{O}-\text{P}-\text{S}-\text{CH}_3 \end{array}$
Molecular mass:	172.21 g/mol

Statement of GLP Compliance

The identification and quantification were performed at Cheminova A/S and conducted according to FIFRA Good Laboratory Practice Standards, 40 CFR Part 160 and the OECD Principles of Good Laboratory Practices.

Date

November 9, 2010


Barbara Hinz



Certificate of Analysis

32 Haviland Street, Unit 1, Norwalk, Connecticut 06854-4906 • 203-299-3220 • Fax: 203-299-1355 • sales@charkit.com • www.charkit.com

Product: Corn Oil NF	Charkit Product Code: 1304071280	Lot # M-631	Document Date: 04/02/2010
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Test Parameter

Results

Sterols, % of Total Cholesterol:	0.1
Brassicasterol:	<0.1
24-Methylene-Cholesterol:	
Campesterol:	20.7
Campestanol:	1.4
Stigmasterol:	8.3
Clerosterol:	0.9
Beta-Sitosterol:	56.5
Sitostanol:	2.6
Delta-5-Avenasterol:	7.4
Delta-5, 24 Stigmasterol:	0.4
Delta-7 Stigmasterol:	0.5
Delta-7 Avenasterol:	1.2
Total Sterols, ppm:	8899
Acid Value:	0.08
Unsaponifiable Matter:	0.85%
Peroxide Value:	0.8 meq/kg
Water:	0.05%
Alkaline Impurities:	Negative

Fatty Acid Composition

C16:0	10.79 %
C18:0	1.60 %
C18:1	26.50 %
C18:2	58.90 %
C18:3	0.86 %

Heavy Metals

Lead:	None Detected
Mercury:	None Detected
Arsenic:	None Detected
Cadmium:	None Detected

Detection Limit = 0.1 ppm

ADDITIONAL INFORMATION

Manufacture Date: 03/18/2010

Expiration Date: 03/18/2012

This information is believed to be accurate and is intended for general guidance. It should not be construed as a guarantee of its suitability for a particular application. Charkit Chemical Corporation offers no warranties either expressed or implied, nor is freedom from any patent owned by Charkit Chemical Corporation or others implied; neither is liability accepted for errors or omissions in the information. Typical properties of products are given for guidance only and do not necessarily represent manufacturing specifications.

501027

APPENDIX 4 - ENVIROMENTAL AND HUSBANDRY REPORTS

TEMPERATURE AND RELATIVE HUMIDITY REPORTS

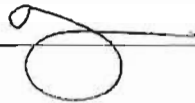
ARGUS

Temperature and Relative Humidity Report			
Location: Room 35-37			
Protocol Number: TQC00066			
Range of Dates: 11-Jan-2011 14:37 to 27-Apr-2011 08:59			
Target Range: Species: rat	Temperature 64°F to 79°F		Relative Humidity 30% to 70%
Total Number of Days:	107		107
Total Number of Hours:	2538.0		2538.0
Total Number of Data Points:	2532		2532
Mean (± SD):	72.7	(± 0.7)	51.6 (± 7.6)
Maximum:	74.5		68.9
Median:	72.7		51.0
Minimum:	66.3		34.9
Number of Points In Range (%):	2532	(100.0)	2532 (100.0)
Number of Points High (%):	0	(0.0)	0 (0.0)
Number of Points Low (%):	0	(0.0)	0 (0.0)

Report Generated: 03-May-2011 at 09:02

COMMENTS: _____

REVIEWED BY: _____ DATE: 13 June



FEED ANALYSIS



Return to Certified Analysis Retrieval

Product Code: 5002M
 Product Desc: CERTIFIED RODENT DIET MEAL
 Lab Number: L1026064-4
 Lot Code: DEC 15 10 2A
 Entered: 1/7/2011

Assay	Analysis	Units
PROTEIN (N X 6.25)	20.7	%
FAT (ACID HYDRO)	5.71	%
FIBER (CRUDE)	4.44	%
ARSENIC	0.212	PPM
CADMIUM	0.0718	PPM
CALCIUM	0.814	%
LEAD	0.142	PPM
MERCURY	LESS THAN 0.025	PPM
PHOSPHORUS	0.6533	%
SELENIUM	0.344	PPM

Organophosphates	PPM	Organophosphates	PPM
Diazinon	LESS THAN 0.02	Disulfoton	LESS THAN 0.02
Ethion	LESS THAN 0.02	Malathion	LESS THAN 0.02
Methyl Parathion	LESS THAN 0.02	Parathion	LESS THAN 0.02
Thimet	LESS THAN 0.02	Trithion	LESS THAN 0.02

Chlorinated Hydrocarbons and PCB	PPM	Chlorinated Hydrocarbons and PCB	PPM
Aldrin	LESS THAN 0.02	Alpha-BHC	LESS THAN 0.02
Beta-BHC	LESS THAN 0.02	Chlordane	LESS THAN 0.02
DDE	LESS THAN 0.02	DDT	LESS THAN 0.02
Delta-BHC	LESS THAN 0.02	Dieldrin	LESS THAN 0.02
Endrin	LESS THAN 0.02	HCB	LESS THAN 0.02
Heptachlor	LESS THAN 0.02	Heptachlor Epoxide	LESS THAN 0.02
Lindane	LESS THAN 0.02	Methoxychlor	LESS THAN 0.02
Mirex	LESS THAN 0.02	PCB	LESS THAN 0.15
Thiodan	LESS THAN 0.02		

AFLATOXIN	PPB Aflatoxins	LESS THAN 5
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Approved
Joseph W. Le
02-mb-2011

EXACT COPY

Certified Papers Retrieval

Page 2 of 2

No notes.

Approved by: Angela Crutcher

Angela Crutcher

For additional information, please contact:

- 1) Customer Service at (314) 982-1310 -- for assay methodology
- 2) Dr. Kristi Thompson, (765)894-3104 or Dr. Carrie Schultz, (314)974-6529 -- for nutritional interpretation
- 3) Richmond, IN Manufacturing Plant at (765) 962-9561 -- all other questions

The term "Less Than" is used to signify the lower limit of quantitation of the procedure under the conditions employed.
The use of the term "Less Than" does not imply that traces of analyte were present.

*Approved
Josephine
02-11-2011*

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MEL 12 DEC 2011

Certified Papers Retrieval

Page 1 of 2



Return to Certified Analysis Retrieval

Product Code: 5002M
 Product Desc: CERTIFIED RODENT DIET MEAL
 Lab Number: L1023133-2
 Lot Code: OCT 12 10 1B
 Entered: 11/2/2010

25T (H)
 15-Dec-2010

Assay	Analysis	Units
PROTEIN (N X 6.25)	21	%
FAT (ACID HYDRO)	6.35	%
FIBER (CRUDE)	4.65	%
ARSENIC	LESS THAN 0.2	PPM
CADMIUM	0.070	PPM
CALCIUM	0.875	%
LEAD	0.233	PPM
MERCURY	LESS THAN 0.025	PPM
PHOSPHORUS	0.6164	%
SELENIUM	0.382	PPM

Organophosphates	PPM	Organophosphates	PPM
Diazinon	LESS THAN 0.02	Disulfoton	LESS THAN 0.02
Ethion	LESS THAN 0.02	Malathion	LESS THAN 0.02
Methyl Parathion	LESS THAN 0.02	Parathion	LESS THAN 0.02
Thimet	LESS THAN 0.02	Trithion	LESS THAN 0.02

Chlorinated Hydrocarbons and PCB	PPM	Chlorinated Hydrocarbons and PCB	PPM
Aldrin	LESS THAN 0.02	Alpha-BHC	LESS THAN 0.02
Beta-BHC	LESS THAN 0.02	Chlordane	LESS THAN 0.02
DDE	LESS THAN 0.02	DDT	LESS THAN 0.02
Delta-BHC	LESS THAN 0.02	Dieldrin	LESS THAN 0.02
Endrin	LESS THAN 0.02	HCB	LESS THAN 0.02
Heptachlor	LESS THAN 0.02	Heptachlor Epoxide	LESS THAN 0.02
Lindane	LESS THAN 0.02	Methoxychlor	LESS THAN 0.02
Mirex	LESS THAN 0.02	PCB	LESS THAN 0.15
Thiodan	LESS THAN 0.02		

AFLATOXIN	PPB Aflatoxins	LESS THAN 5
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EXACT COPY

Approved
 Joseph W. Dahl
 15-Dec-2010

Certified Papers Retrieval

Page 2 of 2



No notes.

Approved by: Angela Crutcher

Angela Crutcher

For additional information, please contact:

- 1) Customer Service at (314) 982-1310 -- for assay methodology
- 2) Dr. Kristi Thompson, (765)894-3104 or Dr. Carrie Schultz, (314)974-6529 -- for nutritional interpretation
- 3) Richmond, IN Manufacturing Plant at (765) 962-9561 -- all other questions

The term "Less Than" is used to signify the lower limit of quantitation of the procedure under the conditions employed.
The use of the term "Less Than" does not imply that traces of analyte were present.

EXACT COPY

*Approved
Josh W. Loh
15 Dec 2010*



Return to Certified Analysis Retrieval

Product Code: 5002M
 Product Desc: CERTIFIED RODENT DIET MEAL
 Lab Number: L1023570-1
 Lot Code: OCT 20 10 3A
 Entered: 11/9/2010

Assay	Analysis	Units
PROTEIN (N X 6.25)	23.3	%
FAT (ACID HYDRO)	6.09	%
FIBER (CRUDE)	4.55	%
ARSENIC	LESS THAN 0.2	PPM
CADMIUM	0.0801	PPM
CALCIUM	0.9267	%
LEAD	0.227	PPM
MERCURY	<0.025	PPM
PHOSPHORUS	0.6431	%
SELENIUM	0.441	PPM

Organophosphates	PPM	Organophosphates	PPM
Diazinon	LESS THAN 0.02	Disulfoton	LESS THAN 0.02
Ethion	LESS THAN 0.02	Malathion	LESS THAN 0.02
Methyl Parathion	LESS THAN 0.02	Parathion	LESS THAN 0.02
Thimet	LESS THAN 0.02	Trithion	LESS THAN 0.02

Chlorinated Hydrocarbons and PCB	PPM	Chlorinated Hydrocarbons and PCB	PPM
Aldrin	LESS THAN 0.02	Alpha-BHC	LESS THAN 0.02
Beta-BHC	LESS THAN 0.02	Chlordane	LESS THAN 0.02
DDE	LESS THAN 0.02	DDT	LESS THAN 0.02
Delta-BHC	LESS THAN 0.02	Dieldrin	LESS THAN 0.02
Endrin	LESS THAN 0.02	HCB	LESS THAN 0.02
Heptachlor	LESS THAN 0.02	Heptachlor Epoxide	LESS THAN 0.02
Lindane	LESS THAN 0.02	Methoxychlor	LESS THAN 0.02
Mirex	LESS THAN 0.02	PCB	LESS THAN 0.15
Thiodan	LESS THAN 0.02		

AFLATOXIN	PPM	LESS THAN 5
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Approved
 Joseph W. Del
 15 Dec 2010

Certified Papers Retrieval

Page 2 of 2



No notes.

Approved by: Angela Crutcher

For additional information, please contact:

- 1) Customer Service at (314) 982-1310 -- for assay methodology
- 2) Dr. Kristi Thompson, (765)894-3104 or Dr. Carrie Schultz, (314)974-6529 -- for nutritional interpretation
- 3) Richmond, IN Manufacturing Plant at (765) 962-9561 -- all other questions

The term "Less Than" is used to signify the lower limit of quantitation of the procedure under the conditions employed.
The use of the term "Less Than" does not imply that traces of analyte were present.

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AFS/Alloy

Approved
Joseph W. Bell
16 Dec 2010

WATER ANALYSES

Note: The original approved water analysis raw data are maintained in the Testing Facility records. A copy of the approved data without hole punches obscuring data are included in this report.



Analytical Report



MATTHEW VANEMAN
CHARLES RIVER LABORATORIES, INC.
905 SHEEHY DRIVE
HORSHAM, PA 19044

Regarding:
MATTHEW VANEMAN
CHARLES RIVER LABORATORIES, INC.
905 SHEEHY DRIVE
HORSHAM, PA 19044

Account No: W05899, CHARLES RIVER LABORATORIES, INC.
Project No: W05899, CHARLES RIVER LABORATORIES, INC.

P.O. No: 6600061155 Inv. No: 1272518
PWSID No:

Sample Number Sample Description
L3596143-1 IN VITRO
Received Temp: 34 F Iced (Y/N): Y

Samp. Date/Time/Temp Sampled by
01/07/11 10:15am NA F Joan Cummings Nulty, QC Laboratories

Parameter	Method	Result	RLs	Test Date, Time, Analyst
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ENVIRONMENTAL MICROBIOLOGY

COLIFORM-MF	SM 9222B	<1 col/100ml	1 col/100ml	01/07/11 05:11PM ARD
STANDARD PLATE COUNT	SM 9215B	<2 col/ml	2 col/ml	01/07/11 04:09PM ARD

FIELD SERVICES

CHLORINE RESIDUAL	SM 4500CL G	< 0.02 mg/l	0.02 mg/l	01/07/11 10:18AM JCN
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Sample Number Sample Description
L3596143-2 ANALYTICAL
Received Temp: 34 F Iced (Y/N): Y

Samp. Date/Time/Temp Sampled by
01/07/11 10:23am NA F Joan Cummings Nulty, QC Laboratories

Parameter	Method	Result	RLs	Test Date, Time, Analyst
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ENVIRONMENTAL MICROBIOLOGY

COLIFORM-MF	SM 9222B	<1 col/100ml	1 col/100ml	01/07/11 05:11PM ARD
STANDARD PLATE COUNT	SM 9215B	<2 col/ml	2 col/ml	01/07/11 04:09PM ARD

FIELD SERVICES

CHLORINE RESIDUAL	SM 4500CL G	< 0.02 mg/l	0.02 mg/l	01/07/11 10:25AM JCN
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Approved
[Signature]
07 JAN 2011

Thomas J. Hines
Thomas J. Hines, President

QC Laboratories

Analytical Report

Account No: W05899, CHARLES RIVER LABORATORIES, INC.
Project No: W05899, CHARLES RIVER LABORATORIES, INC.

P.O. No: 660061155 Inv. No: 1272518
PWSID No:

Sample Number Sample Description
L3596143-3 ROOM 5 RACK 120
Received Temp: 34 F Iced (Y/N): Y

Samp. Date/Time/Temp Sampled by
01/07/11 10:28am NA F Joan Cummings Nulty, QC Laboratories

Parameter	Method	Result	RLs	Test Date, Time, Analyst
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ENVIRONMENTAL MICROBIOLOGY

COLIFORM-MF	SM 9222B	<1 col/100ml	1 col/100ml	01/07/11 05:11PM ARD
STANDARD PLATE COUNT	SM 9215B	<2 col/ml	2 col/ml	01/07/11 04:09PM ARD

FIELD SERVICES

CHLORINE RESIDUAL	SM 4500CL G	0.98 mg/l	0.02 mg/l	01/07/11 10:30AM JCN
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Sample Number Sample Description
L3596143-4 FILL STATION
Received Temp: 34 F Iced (Y/N): Y

Samp. Date/Time/Temp Sampled by
01/07/11 10:33am NA F Joan Cummings Nulty, QC Laboratories

Parameter	Method	Result	RLs	Test Date, Time, Analyst
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ENVIRONMENTAL MICROBIOLOGY

COLIFORM-MF	SM 9222B	<1 col/100ml	1 col/100ml	01/07/11 05:11PM ARD
STANDARD PLATE COUNT	SM 9215B	<2 col/ml	2 col/ml	01/07/11 04:09PM ARD

FIELD SERVICES

CHLORINE RESIDUAL	SM 4500CL G	1.01 mg/l	0.02 mg/l	01/07/11 10:35AM JCN
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Sample Number Sample Description
L3596143-5 ROOM 53 RACK 320
Received Temp: 34 F Iced (Y/N): Y

Samp. Date/Time/Temp Sampled by
01/07/11 10:40am NA F Joan Cummings Nulty, QC Laboratories

Parameter	Method	Result	RLs	Test Date, Time, Analyst
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ENVIRONMENTAL MICROBIOLOGY

COLIFORM-MF	SM 9222B	<1 col/100ml	1 col/100ml	01/07/11 05:11PM ARD
STANDARD PLATE COUNT	SM 9215B	<2 col/ml	2 col/ml	01/07/11 04:09PM ARD

FIELD SERVICES

CHLORINE RESIDUAL	SM 4500CL G	1.19 mg/l	0.02 mg/l	01/07/11 10:42AM JCN
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Approved
[Signature]
07 JAN 2011

Thomas J. Hines
Thomas J. Hines, President

QC Laboratories

Analytical Report

Account No: W05898, CHARLES RIVER LABORATORIES, INC.
Project No: W05899, CHARLES RIVER LABORATORIES, INC.

P.O. No: 6600061155 Inv. No: 1272518
PWSID No:

Sample Number Sample Description
L3596143-6 FORMULATION

Samp. Date/Time/Temp Sampled by
01/07/11 10:44am NA F Joen Cummings Nulty, QC Laboratories

Received Temp: 34 F Iced (Y/N): Y

Parameter	Method	Result	RLs	Test Date, Time, Analyst
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ENVIRONMENTAL MICROBIOLOGY

COLIFORM-MF	SM 9222B	<1 col/100ml	1 col/100ml	01/07/11 05:11PM ARD
STANDARD PLATE COUNT	SM 9215B	<2 col/ml	2 col/ml	01/07/11 04:09PM ARD

FIELD SERVICES

CHLORINE RESIDUAL	SM 4500CL G	< 0.02 mg/l	0.02 mg/l	01/07/11 10:46AM JCN
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L3596143-1 :

A water supply is considered bacteriologically "SAFE" if no Coliform bacteria are detected. To be considered "SAFE" your report should indicate "<1 col/100ml" or "NEG" for the Coliform Test. If your report indicates a positive result "POS" or a value of one (1) or greater then your supply is "UNSAFE FOR DRINKING" contact your local Health Dept. or QC for advice.

L3596143-2 :

A water supply is considered bacteriologically "SAFE" if no Coliform bacteria are detected. To be considered "SAFE" your report should indicate "<1 col/100ml" or "NEG" for the Coliform Test. If your report indicates a positive result "POS" or a value of one (1) or greater then your supply is "UNSAFE FOR DRINKING" contact your local Health Dept. or QC for advice.

L3596143-3 :

A water supply is considered bacteriologically "SAFE" if no Coliform bacteria are detected. To be considered "SAFE" your report should indicate "<1 col/100ml" or "NEG" for the Coliform Test. If your report indicates a positive result "POS" or a value of one (1) or greater then your supply is "UNSAFE FOR DRINKING" contact your local Health Dept. or QC for advice.

L3596143-4 :

A water supply is considered bacteriologically "SAFE" if no Coliform bacteria are detected. To be considered "SAFE" your report should indicate "<1 col/100ml" or "NEG" for the Coliform Test. If your report indicates a positive result "POS" or a value of one (1) or greater then your supply is "UNSAFE FOR DRINKING" contact your local Health Dept. or QC for advice.

L3596143-5 :

A water supply is considered bacteriologically "SAFE" if no Coliform bacteria are detected. To be considered "SAFE" your report should indicate "<1 col/100ml" or "NEG" for the Coliform Test. If your report indicates a positive result "POS" or a value of one (1) or greater then your supply is "UNSAFE FOR DRINKING" contact your local Health Dept. or QC for advice.

L3596143-6 :

A water supply is considered bacteriologically "SAFE" if no Coliform bacteria are detected. To be considered "SAFE" your report should indicate "<1 col/100ml" or "NEG" for the Coliform Test. If your report indicates a positive result "POS" or a value of one (1) or greater then your supply is "UNSAFE FOR DRINKING" contact your local Health Dept. or QC for advice.

Notes:

- A result of "ND" indicates the concentration of the analyte tested was either not detected or below the RLs.
- Definitions: ND=not detected; NEG=negative; POS=positive; COL=colonies; RLs=laboratory reporting limits; L/A=laboratory accident; TNTC=too numerous to count

Approved
[Signature]
07/12/2011

QC Laboratories

Analytical Report

Account No: W05899, CHARLES RIVER LABORATORIES, INC.
Project No: W05899, CHARLES RIVER LABORATORIES, INC.

P.O. No: 6600061155 Inv. No: 1272518
PWSID No:

- A result marked with "DRY" indicates that the result was calculated and reported on a dry weight basis.
- All analysis, except field tests are conducted in Southampton, PA unless otherwise identified.
- The test pH lab is analyzed upon receipt at the laboratory, the result will not be suitable for regulatory purposes.
- The reported results relate only to the samples.
- QC NELAP ID's: PA 09-00131, NJ PA106, FL E87954, NY 11223, CT PH-0768, DE PA-018, KY 90228, MD 206, EPA PA00018, Bioassay: PA 09-03574, NJ PA034, FL E87953, KS E10373, SC 89021001.
- QC STATE ID's: Wind Gap, NJ PA001, PA 48-01334; E RUTHERFORD NJ02015; Vineland NJ06005; Reading PA 06-03543.
- All samples are collected as "grab" samples unless otherwise identified.
- MCL= is the EPA recommended "maximum contaminant level" for a parameter. PLs=customer specific permit limits.
- The test results meet all requirements of NELAP unless otherwise specified.
- The report shall not be reproduced except in full without the written consent of the laboratory.

Regulatory authorities are assessing substantial fines for testing omissions. Please track your sample collections and results on a weekly, monthly, or quarterly basis to ensure compliance. QC's Internet program 'LIVE ACCESS' will provide you with real-time access to collection dates and results. Please contact Customer Service for further information on acquiring LIVE ACCESS.



Approved
[Signature]
07 JAN 2011



Analytical Report



MATTHEW VANEMAN
CHARLES RIVER LABORATORIES, INC.
905 SHEEHY DRIVE
HORSHAM, PA 19044

Regarding:
MATTHEW VANEMAN
CHARLES RIVER LABORATORIES, INC.
905 SHEEHY DRIVE
HORSHAM, PA 19044

Account No: W05899, CHARLES RIVER LABORATORIES, INC.
Project No: W05899, CHARLES RIVER LABORATORIES, INC.

P.O. No: 6600061155 Inv. No: 1279010
PWSID No:

Sample Number Sample Description Smp. Date/Time/Temp Sampled by
L3628929-1 ANALYTICAL 02/04/11 11:29am NA F Customer Sampled
Received Temp: 34 F Iced (Y/N): Y

Parameter	Method	Result	RLs	Test Date, Time, Analyst
ENVIRONMENTAL MICROBIOLOGY				
COLIFORM-MF	SM 9222B	<1 col/100ml	1 col/100ml	02/05/11 02:53PM ARD
STANDARD PLATE COUNT	SM 9215B	<2 col/ml	2 col/ml	02/05/11 11:07AM TF

FIELD SERVICES

CHLORINE RESIDUAL	SM 4500CL G	< 0.02 mg/l	0.02 mg/l	02/04/11 11:30AM JCN
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Sample Number Sample Description Smp. Date/Time/Temp Sampled by
L3628929-2 FILL STATION 02/04/11 11:31am NA F Customer Sampled
Received Temp: 34 F Iced (Y/N): Y

Parameter	Method	Result	RLs	Test Date, Time, Analyst
ENVIRONMENTAL MICROBIOLOGY				
COLIFORM-MF	SM 9222B	<1 col/100ml	1 col/100ml	02/05/11 02:53PM ARD
STANDARD PLATE COUNT	SM 9215B	<2 col/ml	2 col/ml	02/05/11 11:07AM TF

FIELD SERVICES

CHLORINE RESIDUAL	SM 4500CL G	1.10 mg/l	0.02 mg/l	02/04/11 11:32AM JCN
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Approved
Joseph J. Del
01-MAR-2011

Thomas J. Hines
Thomas J. Hines, President

EXACT COPY

QC Laboratories

Analytical Report

Account No: W05899, CHARLES RIVER LABORATORIES, INC.
 Project No: W05899, CHARLES RIVER LABORATORIES, INC.

P.O. No: 6600061155 Inv. No: 1279010
 PWSID No:

Sample Number Sample Description
 L3628929-3 ROOM 13 RACK 116
 Received Temp: 34 F Iced (Y/N): Y

Samp. Date/Time/Temp Sampled by
 02/04/11 11:38am NA F Customer Sampled

Parameter	Method	Result	RLs	Test Date, Time, Analyst
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ENVIRONMENTAL MICROBIOLOGY

COLIFORM-MF	SM 9222B	<1 col/100ml	1 col/100ml	02/05/11 02:53PM ARD
STANDARD PLATE COUNT	SM 9215B	<2 col/ml	2 col/ml	02/05/11 11:07AM TF

FIELD SERVICES

CHLORINE RESIDUAL	SM 4500CL G	0.50 mg/l	0.02 mg/l	02/04/11 11:37AM JCN
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Sample Number Sample Description
 L3628929-4 FORMULATION
 Received Temp: 34 F Iced (Y/N): Y

Samp. Date/Time/Temp Sampled by
 02/04/11 11:38am NA F Customer Sampled

Parameter	Method	Result	RLs	Test Date, Time, Analyst
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ENVIRONMENTAL MICROBIOLOGY

COLIFORM-MF	SM 9222B	<1 col/100ml	1 col/100ml	02/05/11 02:54PM ARD
STANDARD PLATE COUNT	SM 9215B	<2 col/ml	2 col/ml	02/05/11 11:07AM TF

FIELD SERVICES

CHLORINE RESIDUAL	SM 4500CL G	< 0.02 mg/l	0.02 mg/l	02/04/11 11:39AM JCN
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Sample Number Sample Description
 L3628929-5 ROOM 46 RACK 54
 Received Temp: 34 F Iced (Y/N): Y

Samp. Date/Time/Temp Sampled by
 02/04/11 11:43am NA F Customer Sampled

Parameter	Method	Result	RLs	Test Date, Time, Analyst
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ENVIRONMENTAL MICROBIOLOGY

COLIFORM-MF	SM 9222B	<1 col/100ml	1 col/100ml	02/05/11 02:56PM ARD
STANDARD PLATE COUNT	SM 9215B	<2 col/ml	2 col/ml	02/05/11 11:07AM TF

FIELD SERVICES

CHLORINE RESIDUAL	SM 4500CL G	0.92 mg/l	0.02 mg/l	02/04/11 11:44AM JCN
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Approved
Joseph W. D.
 01-march 2011

Thomas J. Hines
 Thomas J. Hines, President

EXACT COPY

QC Laboratories

Analytical Report

Account No: W05899, CHARLES RIVER LABORATORIES, INC.
Project No: W05899, CHARLES RIVER LABORATORIES, INC.

P.O. No: 6600081155 Inv. No: 1279010
PWSID No:

Sample Number Sample Description

L3628929-6 H-1
Received Temp: 34 F Iced (Y/N): Y

Samp. Date/Time/Temp Sampled by

02/04/11 11:50am NA F Customer Sampled

Parameter	Method	Result	RLs	Test Date, Time, Analyst
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ENVIRONMENTAL MICROBIOLOGY

COLIFORM-MF	SM 9222B	<1 col/100ml	1 col/100ml	02/05/11 02:56PM ARD
STANDARD PLATE COUNT	SM 9215B	<2 col/ml	2 col/ml	02/05/11 11:07AM TF

FIELD SERVICES

CHLORINE RESIDUAL	SM 4500CL G	0.45 mg/l	0.02 mg/l	02/04/11 11:51AM JCN
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Sample Number Sample Description

L3628929-7 H-2
Received Temp: 34 F Iced (Y/N): Y

Samp. Date/Time/Temp Sampled by

02/04/11 11:54am NA F Customer Sampled

Parameter	Method	Result	RLs	Test Date, Time, Analyst
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ENVIRONMENTAL MICROBIOLOGY

COLIFORM-MF	SM 9222B	<1 col/100ml	1 col/100ml	02/05/11 02:56PM ARD
STANDARD PLATE COUNT	SM 9215B	<2 col/ml	2 col/ml	02/05/11 11:07AM TF

FIELD SERVICES

CHLORINE RESIDUAL	SM 4500CL G	0.42 mg/l	0.02 mg/l	02/04/11 11:55AM JCN
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L3628929-1:

A water supply is considered bacteriologically "SAFE" if no Coliform bacteria are detected. To be considered "SAFE" your report should indicate "<1 col/100ml" or "NEG" for the Coliform Test. If your report indicates a positive result "POS" or a value of one (1) or greater then your supply is "UNSAFE FOR DRINKING" contact your local Health Dept. or QC for advice.

L3628929-2:

A water supply is considered bacteriologically "SAFE" if no Coliform bacteria are detected. To be considered "SAFE" your report should indicate "<1 col/100ml" or "NEG" for the Coliform Test. If your report indicates a positive result "POS" or a value of one (1) or greater then your supply is "UNSAFE FOR DRINKING" contact your local Health Dept. or QC for advice.

L3628929-3:

A water supply is considered bacteriologically "SAFE" if no Coliform bacteria are detected. To be considered "SAFE" your report should indicate "<1 col/100ml" or "NEG" for the Coliform Test. If your report indicates a positive result "POS" or a value of one (1) or greater then your supply is "UNSAFE FOR DRINKING" contact your local Health Dept. or QC for advice.

L3628929-4:

A water supply is considered bacteriologically "SAFE" if no Coliform bacteria are detected. To be considered "SAFE" your report should indicate "<1 col/100ml" or "NEG" for the Coliform Test. If your report indicates a positive result "POS" or a value of one (1) or greater then your supply is "UNSAFE FOR DRINKING" contact your local Health Dept. or QC for advice.

L3628929-5:

Page 3 of 4

Serial Number: 1634964

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Thomas J. Hines
Thomas J. Hines, President

QC Laboratories

Analytical Report

Account No: W05899, CHARLES RIVER LABORATORIES, INC.
Project No: W05899, CHARLES RIVER LABORATORIES, INC.

P.O. No: 6600061155 Inv. No: 1279010
PWSID No:

A water supply is considered bacteriologically "SAFE" if no Coliform bacteria are detected. To be considered "SAFE" your report should indicate "<1 col/100ml" or "NEG" for the Coliform Test. If your report indicates a positive result "POS" or a value of one (1) or greater then your supply is "UNSAFE FOR DRINKING" contact your local Health Dept. or QC for advice.

L3628929-6 :

A water supply is considered bacteriologically "SAFE" if no Coliform bacteria are detected. To be considered "SAFE" your report should indicate "<1 col/100ml" or "NEG" for the Coliform Test. If your report indicates a positive result "POS" or a value of one (1) or greater then your supply is "UNSAFE FOR DRINKING" contact your local Health Dept. or QC for advice.

L3628929-7 :

A water supply is considered bacteriologically "SAFE" if no Coliform bacteria are detected. To be considered "SAFE" your report should indicate "<1 col/100ml" or "NEG" for the Coliform Test. If your report indicates a positive result "POS" or a value of one (1) or greater then your supply is "UNSAFE FOR DRINKING" contact your local Health Dept. or QC for advice.

Notes:

- A result of "ND" indicates the concentration of the analyte tested was either not detected or below the RLs.
- Definitions: ND=not detected; NEG=negative; POS=positive; COL=colonies; RLs=laboratory reporting limits; L/A=laboratory accident; TNTC=too numerous to count
- A result marked with "DRY" indicates that the result was calculated and reported on a dry weight basis.
- All analysis, except field tests are conducted in Southampton, PA unless otherwise identified.
- The test "pH lab" is analyzed upon receipt at the laboratory, the result will not be suitable for regulatory purposes.
- The reported results relate only to the samples.
- QC NELAP ID's: PA 09-00131, NJ PA186, FL E87954, NY 11223, CT PH-0768, DE PA-018, KY 90228, MD 206, EPA PA00018, Bioassay: PA 09-03574, NJ PA034, FL E87953, KS E10373, SC 89021001.
- QC STATE ID's: Wind Gap, NJ PA001, PA 48-01334; E RUTHERFORD NJ02015; Vineland NJ06005; Reading PA 06-03543.
- All samples are collected as "grab" samples unless otherwise identified.
- MCL= is the EPA recommended "maximum contaminant level" for a parameter. PLs=customer specific permit limits.
- The test results meet all requirements of NELAC unless otherwise specified.
- The report shall not be reproduced except in full without the written consent of the laboratory.

Regulatory authorities are assessing substantial fines for testing omissions. Please track your sample collections and results on a weekly, monthly, or quarterly basis to ensure compliance. QC's internet program 'LIVE ACCESS' will provide you with real-time access to collection dates and results. Please contact Customer Service for further information on acquiring LIVE ACCESS.



Approved
Joseph R.
01-10-2011

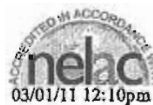
Thomas J. Hines
Thomas J. Hines, President

EXACT COPY



QC Laboratories

Analytical Report



MATTHEW VANEMAN
CHARLES RIVER LABORATORIES, INC.
905 SHEEHY DRIVE
HORSHAM, PA 19044

Regarding:
MATTHEW VANEMAN
CHARLES RIVER LABORATORIES, INC.
905 SHEEHY DRIVE
HORSHAM, PA 19044

Account No: W05899, CHARLES RIVER LABORATORIES, INC.
Project No: W05899, CHARLES RIVER LABORATORIES, INC.

P.O. No: 6600090617 Inv. No: 1283582
PWSID No:

Sample Number Sample Description Samp. Date/Time/Temp Sampled by
L3668592-1 IN VITRO 02/25/11 11:03am NA F Customer Sampled
Received Temp: 35 F Iced (Y/N): Y

Parameter	Method	Result	RLs	Test Data, Time, Analyst
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ENVIRONMENTAL MICROBIOLOGY

COLIFORM-MF	SM 9222B	<1 col/100ml	1 col/100ml	02/26/11 11:19AM ARD
STANDARD PLATE COUNT	SM 9215B	<2 col/ml	2 col/ml	02/26/11 08:44AM CAS

FIELD SERVICES

CHLORINE RESIDUAL	SM 4500CL G	< 0.02 mg/l	0.02 mg/l	02/25/11 11:07AM CU
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L3668592-1:

A water supply is considered bacteriologically "SAFE" if no Coliform bacteria are detected. To be considered "SAFE" your report should indicate "<1 col/100ml" or "NEG" for the Coliform Test. If your report indicates a positive result "POS" or a value of one (1) or greater then your supply is "UNSAFE FOR DRINKING" contact your local Health Dept. or QC for advice.

Notes:

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- Definitions: ND=not detected; NEG=negative; POS=positive; COL=colonies; RLs=laboratory reporting limits; L/A=laboratory accident; TNTC=too numerous to count
- A result marked with "DRY" indicates that the result was calculated and reported on a dry weight basis.
- All analysis, except field tests are conducted in Southampton, PA unless otherwise identified.
- The test "pH lab" is analyzed upon receipt at the laboratory, the result will not be suitable for regulatory purposes.
- The reported results relate only to the samples.
- QC NELAP ID's: PA 09-00131, NJ PA166, FL E87954, NY 11223, CT PH-0768, DE PA-018, KY 90228, MD 206, EPA PA00018 Bioassay PA 09-03574, NJ PA034, FL E87953, KS E10373, SC 89021001.
- QC STATE ID's: Wind Gap, NJ PA001, PA 48-01334; E RUTHERFORD NJ02015; Vineland NJ06005; Reading PA 06-03543.
- All samples are collected as "grab" samples unless otherwise identified.
- MCL= is the EPA recommended "maximum contaminant level" for a parameter. PLs=customer specific permit limits.
- The test results meet all requirements of NELAP unless otherwise specified.
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Page 1 of 2

This report is a revision of report number 1684293
Serial Number: 1651370

EXACT COPY

Thomas J. Hines
Thomas J. Hines, President

1205 Industrial Blvd., P.O. Box 514, Southampton, PA 18966-0514 Phone: 215-355-3900 Fax: 215-355-7231 www.qclaboratories.com

QC Laboratories

Analytical Report

Account No: W05899, CHARLES RIVER LABORATORIES, INC.
Project No: W05899, CHARLES RIVER LABORATORIES, INC.

P.O. No: 6600090617 Inv. No: 1283582
PWSID No:



Approved
Joseph J. L.
01-11-2011

Page 2 of 2

This report is a revision of report number 1648293
Serial Number: 1651370

Thomas J. Ames
Thomas J. Ames, President

EXACT COPY
APR 1 2011



QC Laboratories

Analytical Report



MATTHEW VANEMAN
CHARLES RIVER LABORATORIES, INC.
905 SHEEHY DRIVE
HORSHAM, PA 19044

Regarding:
MATTHEW VANEMAN
CHARLES RIVER LABORATORIES, INC.
905 SHEEHY DRIVE
HORSHAM, PA 19044

Account No: W05899, CHARLES RIVER LABORATORIES, INC.
Project No: W05899, CHARLES RIVER LABORATORIES, INC.

P.O. No: 6600090617 Inv. No: 1285789
PWSID No:

Sample Number Sample Description
L3656690-1 IN VITRO
Received Temp: 34 F Iced (Y/N): Y

Samp. Date/Time/Temp Sampled by
03/04/11 01:36pm NA F Customer Sampled

Parameter	Method	Result	RLs	Test Date, Time, Analyst
ENVIRONMENTAL MICROBIOLOGY				
COLIFORM-MF	SM 9222B	<1 col/100ml	1 col/100ml	03/05/11 11:32AM ARD
STANDARD PLATE COUNT	SM 9215B	2 col/ml	2 col/ml	03/05/11 05:57AM CAS

FIELD SERVICES

CHLORINE RESIDUAL	SM 4500CL G	< 0.02 mg/l	0.02 mg/l	03/04/11 01:36PM CU
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Sample Number Sample Description
L3656690-2 ANALYTICAL
Received Temp: 34 F Iced (Y/N): Y

Samp. Date/Time/Temp Sampled by
03/04/11 01:47pm NA F Customer Sampled

Parameter	Method	Result	RLs	Test Date, Time, Analyst
ENVIRONMENTAL MICROBIOLOGY				
COLIFORM-MF	SM 9222B	<1 col/100ml	1 col/100ml	03/05/11 11:32AM ARD
STANDARD PLATE COUNT	SM 9215B	3 col/ml	2 col/ml	03/05/11 05:57AM CAS

FIELD SERVICES

CHLORINE RESIDUAL	SM 4500CL G	< 0.02 mg/l	0.02 mg/l	03/04/11 01:47PM CU
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Approved
Joseph L.
14-MAR-2011

EXACT COPY

Serial Number: 1662867

Thomas J. Hines
Thomas J. Hines, President

QC Laboratories

Analytical Report

Account No: W05899, CHARLES RIVER LABORATORIES, INC.
Project No: W05899, CHARLES RIVER LABORATORIES, INC.

P.O. No: 6600090617 Inv. No: 1285789
PWSID No:

Sample Number Sample Description
L3656690-3 ROOM 20 RACK 0040
Received Temp: 34 F Iced (Y/N): Y

Samp. Date/Time/Temp Sampled by
03/04/11 01:52pm NA F Customer Sampled

Parameter	Method	Result	RLs	Test Date, Time, Analyst
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ENVIRONMENTAL MICROBIOLOGY

COLIFORM-MF	SM 9222B	<1 col/100ml	1 col/100ml	03/05/11 11:32AM ARD
STANDARD PLATE COUNT	SM 9215B	<2 col/ml	2 col/ml	03/05/11 05:57AM CAS

FIELD SERVICES

CHLORINE RESIDUAL	SM 4500CL G	0.60 mg/l	0.02 mg/l	03/04/11 01:52PM CU
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Sample Number Sample Description
L3656690-4 FILL STATION
Received Temp: 34 F Iced (Y/N): Y

Samp. Date/Time/Temp Sampled by
03/04/11 01:55pm NA F Customer Sampled

Parameter	Method	Result	RLs	Test Date, Time, Analyst
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ENVIRONMENTAL MICROBIOLOGY

COLIFORM-MF	SM 9222B	<1 col/100ml	1 col/100ml	03/05/11 11:34AM ARD
STANDARD PLATE COUNT	SM 9215B	<2 col/ml	2 col/ml	03/05/11 05:57AM CAS

FIELD SERVICES

CHLORINE RESIDUAL	SM 4500CL G	1.00 mg/l	0.02 mg/l	03/04/11 01:55PM CU
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Sample Number Sample Description
L3656690-5 ROOM 39 RACK 1026
Received Temp: 34 F Iced (Y/N): Y

Samp. Date/Time/Temp Sampled by
03/04/11 01:59pm NA F Customer Sampled

Parameter	Method	Result	RLs	Test Date, Time, Analyst
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ENVIRONMENTAL MICROBIOLOGY

COLIFORM-MF	SM 9222B	<1 col/100ml	1 col/100ml	03/05/11 11:34AM ARD
STANDARD PLATE COUNT	SM 9215B	<2 col/ml	2 col/ml	03/05/11 05:57AM CAS

FIELD SERVICES

CHLORINE RESIDUAL	SM 4500CL G	0.99 mg/l	0.02 mg/l	03/04/11 01:59PM CU
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EXACT COPY

QC Laboratories

Analytical Report

Account No: W05899, CHARLES RIVER LABORATORIES, INC.
Project No: W05899, CHARLES RIVER LABORATORIES, INC.

P.O. No: 6600090617 Inv. No: 1285789
PWSID No:

Sample Number Sample Description
L3656690-6 FORMULATION
Received Temp: 34 F Iced (Y/N): Y

Samp. Date/Time/Temp Sampled by
03/04/11 02:03pm NA F Customer Sampled

Parameter	Method	Result	RLs	Test Date, Time, Analyst
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ENVIRONMENTAL MICROBIOLOGY

COLIFORM-MF	SM 9222B	<1 col/100ml	1 col/100ml	03/05/11 11:36AM ARD
STANDARD PLATE COUNT	SM 9215B	<2 col/ml	2 col/ml	03/05/11 05:57AM CAS

FIELD SERVICES

CHLORINE RESIDUAL	SM 4500CL G	< 0.02 mg/l	0.02 mg/l	03/04/11 02:03PM CU
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Sample Number Sample Description
L3656690-7 H-1
Received Temp: 34 F Iced (Y/N): Y

Samp. Date/Time/Temp Sampled by
03/04/11 01:28pm NA F Customer Sampled

Parameter	Method	Result	RLs	Test Date, Time, Analyst
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ENVIRONMENTAL MICROBIOLOGY

COLIFORM-MF	SM 9222B	<1 col/100ml	1 col/100ml	03/05/11 11:36AM ARD
STANDARD PLATE COUNT	SM 9215B	<2 col/ml	2 col/ml	03/05/11 05:57AM CAS

FIELD SERVICES

CHLORINE RESIDUAL	SM 4500CL G	0.38 mg/l	0.02 mg/l	03/04/11 01:28PM CU
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L3656690-1:

A water supply is considered bacteriologically "SAFE" if no Coliform bacteria are detected. To be considered "SAFE" your report should indicate "<1 col/100ml" or "NEG" for the Coliform Test. If your report indicates a positive result "POS" or a value of one (1) or greater then your supply is "UNSAFE FOR DRINKING" contact your local Health Dept. or QC for advice.

L3656690-2:

A water supply is considered bacteriologically "SAFE" if no Coliform bacteria are detected. To be considered "SAFE" your report should indicate "<1 col/100ml" or "NEG" for the Coliform Test. If your report indicates a positive result "POS" or a value of one (1) or greater then your supply is "UNSAFE FOR DRINKING" contact your local Health Dept. or QC for advice.

L3656690-3:

A water supply is considered bacteriologically "SAFE" if no Coliform bacteria are detected. To be considered "SAFE" your report should indicate "<1 col/100ml" or "NEG" for the Coliform Test. If your report indicates a positive result "POS" or a value of one (1) or greater then your supply is "UNSAFE FOR DRINKING" contact your local Health Dept. or QC for advice.

L3656690-4:

A water supply is considered bacteriologically "SAFE" if no Coliform bacteria are detected. To be considered "SAFE" your report should indicate "<1 col/100ml" or "NEG" for the Coliform Test. If your report indicates a positive result "POS" or a value of one (1) or greater then your supply is "UNSAFE FOR DRINKING" contact your local Health Dept. or QC for advice.

L3656690-5:

Page 3 of 4

EXACT COPY

Serial Number: 1662867

Thomas J. Hines
Thomas J. Hines, President

*Approved
Joseph H. Hines
14-Mar-2011*

QC Laboratories

Analytical Report

Account No: W05899, CHARLES RIVER LABORATORIES, INC.
Project No: W05899, CHARLES RIVER LABORATORIES, INC.

P.O. No: 6600090617 Inv. No: 1285789
PWSID No:

A water supply is considered bacteriologically "SAFE" if no Coliform bacteria are detected. To be considered "SAFE" your report should indicate "<1 col/100ml" or "NEG" for the Coliform Test. If your report indicates a positive result "POS" or a value of one (1) or greater then your supply is "UNSAFE FOR DRINKING" contact your local Health Dept. or QC for advice.

L3656690-6 :

A water supply is considered bacteriologically "SAFE" if no Coliform bacteria are detected. To be considered "SAFE" your report should indicate "<1 col/100ml" or "NEG" for the Coliform Test. If your report indicates a positive result "POS" or a value of one (1) or greater then your supply is "UNSAFE FOR DRINKING" contact your local Health Dept. or QC for advice.

L3656690-7 :

A water supply is considered bacteriologically "SAFE" if no Coliform bacteria are detected. To be considered "SAFE" your report should indicate "<1 col/100ml" or "NEG" for the Coliform Test. If your report indicates a positive result "POS" or a value of one (1) or greater then your supply is "UNSAFE FOR DRINKING" contact your local Health Dept. or QC for advice.

Notes:

- A result of "ND" indicates the concentration of the analyte tested was either not detected or below the RLs.
- Definitions: ND=not detected; NEG=negative; POS=positive; COL=colonies; RLs=laboratory reporting limits; L/A=laboratory accident; TNTC=too numerous to count
- A result marked with "DRY" indicates that the result was calculated and reported on a dry weight basis.
- All analysis, except field tests are conducted in Southampton, PA unless otherwise identified.
- The test pH lab is analyzed upon receipt at the laboratory, the result will not be suitable for regulatory purposes.
- The reported results relate only to the samples.
- QC NELAP ID's: PA 09-00131, NJ PA166, FL E87954, NY 11223, CT PH-0768, DE PA-018, KY 90228, MD 206, EPA PA00018, Bioassay: PA 09-03574, NJ PA034, FL E87953, KS E10373, SC 89021001.
- QC STATE ID's: Wind Gap, NJ PA001, PA 48-01334; E RUTHERFORD NJ02015; Vineland NJ06005; Reading PA 06-03543.
- All samples are collected as "grab" samples unless otherwise identified.
- MCL= is the EPA recommended "maximum contaminant level" for a parameter. PLs=customer specific permit limits.
- The test results meet all requirements of NELAC unless otherwise specified.
- The report shall not be reproduced except in full without the written consent of the laboratory.

Regulatory authorities are assessing substantial fines for testing omissions. Please track your sample collections and results on a weekly, monthly, or quarterly basis to ensure compliance. QC's internet program 'LIVE ACCESS' will provide you with real-time access to collection dates and results. Please contact Customer Service for further information on acquiring LIVE ACCESS.



Approved
Joseph W. Hill
14-Mar-2017



Analytical Report

Exact Copy

APR 26 2011



MATTHEW VANEMAN
CHARLES RIVER LABORATORIES, INC.
905 SHEEHY DRIVE
HORSHAM, PA 19044

Regarding:
MATTHEW VANEMAN
CHARLES RIVER LABORATORIES, INC.
905 SHEEHY DRIVE
HORSHAM, PA 19044

Account No: W05899, CHARLES RIVER LABORATORIES, INC.
Project No: W05899, CHARLES RIVER LABORATORIES, INC.

P.O. No: 600090617 Inv. No: 1292859
PWSID No:

Sample Number Sample Description
L3683272-1 BLDG 935 IN VITRO
Received Temp: 34 F Iced (Y/N): Y
Samp. Date/Time/Temp Sampled by
04/01/11 11:39am NA F Customer Sampled

Parameter	Method	Result	RLs	Test Date, Time, Analyst
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ENVIRONMENTAL MICROBIOLOGY

COLIFORM-MF	SM 9222B	<1 col/100ml	1 col/100ml	04/02/11 12:30PM ARD
STANDARD PLATE COUNT	SM 9215B	2 col/ml	2 col/ml	04/02/11 11:10AM CAS

FIELD SERVICES

CHLORINE RESIDUAL	SM 4500CL G	< 0.02 mg/l	0.02 mg/l	04/01/11 11:40AM JCN
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Sample Number Sample Description
L3683272-2 BLDG 935 H-2
Received Temp: 34 F Iced (Y/N): Y
Samp. Date/Time/Temp Sampled by
04/01/11 11:45am NA F Customer Sampled

Parameter	Method	Result	RLs	Test Date, Time, Analyst
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ENVIRONMENTAL MICROBIOLOGY

COLIFORM-MF	SM 9222B	<1 col/100ml	1 col/100ml	04/02/11 12:30PM ARD
STANDARD PLATE COUNT	SM 9215B	<2 col/ml	2 col/ml	04/02/11 11:10AM CAS

FIELD SERVICES

CHLORINE RESIDUAL	SM 4500CL G	0.41 mg/l	0.02 mg/l	04/01/11 11:48AM JCN
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Approved
08 APR 2011
Joseph Del

Exact Copy
AFS & mg/l

QC Laboratories

Analytical Report

Account No: W05899, CHARLES RIVER LABORATORIES, INC.
Project No: W05899, CHARLES RIVER LABORATORIES, INC.

P.O. No: 6600090617

Inv. No: 1292859
PWSID No:Sample Number Sample Description
L3683272-3 BLDG 905 ANALYTICAL
Received Temp: 34 F Iced (Y/N): YSamp. Date/Time/Temp Sampled by
04/01/11 11:54am NA F Customer Sampled

Parameter	Method	Result	RLs	Test Date, Time, Analyst
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ENVIRONMENTAL MICROBIOLOGY

COLIFORM-MF	SM 9222B	<1 col/100ml	1 col/100ml	04/02/11 12:31PM ARD
STANDARD PLATE COUNT	SM 9215B	<2 col/ml	2 col/ml	04/02/11 11:10AM CAS

FIELD SERVICES

CHLORINE RESIDUAL	SM 4500CL G	< 0.02 mg/l	0.02 mg/l	04/01/11 11:55AM JCN
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Sample Number Sample Description
L3683272-4 BLDG 905 ROOM 10 RACK 62
Received Temp: 34 F Iced (Y/N): YSamp. Date/Time/Temp Sampled by
04/01/11 11:57am NA F Customer Sampled

Parameter	Method	Result	RLs	Test Date, Time, Analyst
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ENVIRONMENTAL MICROBIOLOGY

COLIFORM-MF	SM 9222B	<1 col/100ml	1 col/100ml	04/02/11 12:31PM ARD
STANDARD PLATE COUNT	SM 9215B	<2 col/ml	2 col/ml	04/02/11 11:10AM CAS

FIELD SERVICES

CHLORINE RESIDUAL	SM 4500CL G	0.40 mg/l	0.02 mg/l	04/01/11 11:59AM JCN
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Sample Number Sample Description
L3683272-5 BLDG 905 FILL STATION
Received Temp: 34 F Iced (Y/N): YSamp. Date/Time/Temp Sampled by
04/01/11 12:05pm NA F Customer Sampled

Parameter	Method	Result	RLs	Test Date, Time, Analyst
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ENVIRONMENTAL MICROBIOLOGY

COLIFORM-MF	SM 9222B	<1 col/100ml	1 col/100ml	04/02/11 12:31PM ARD
STANDARD PLATE COUNT	SM 9215B	<2 col/ml	2 col/ml	04/02/11 11:10AM CAS

FIELD SERVICES

CHLORINE RESIDUAL	SM 4500CL G	0.81 mg/l	0.02 mg/l	04/01/11 12:06PM JCN
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Approved
Joseph W. Hines
08 APR 2011Thomas J. Hines
Thomas J. Hines, President

Exact Copy
4/13/2011

QC Laboratories

Analytical Report

Account No: W05899, CHARLES RIVER LABORATORIES, INC.
Project No: W05899, CHARLES RIVER LABORATORIES, INC.

P.O. No: 600090617

Inv. No: 1292859

PWSID No:

Sample Number Sample Description

L3683272-6 BLDG 905 ROOM 45 RACK 1348 R
Received Temp: 34 F Iced (Y/N): Y

Samp. Date/Time/Temp Sampled by

04/01/11 12:09pm NA F Customer Sampled

Parameter	Method	Result	RLs	Test Date, Time, Analyst
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ENVIRONMENTAL MICROBIOLOGY

COLIFORM-MF	SM 9222B	<1 col/100ml	1 col/100ml	04/02/11 12:33PM ARD
STANDARD PLATE COUNT	SM 9215B	<2 col/ml	2 col/ml	04/02/11 11:10AM CAS

FIELD SERVICES

CHLORINE RESIDUAL	SM 4500CL G	1.05 mg/l	0.02 mg/l	04/01/11 12:10PM JCN
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Sample Number Sample Description

L3683272-7 BLDG 905 FORMULATION
Received Temp: 34 F Iced (Y/N): Y

Samp. Date/Time/Temp Sampled by

04/01/11 12:17pm NA F Customer Sampled

Parameter	Method	Result	RLs	Test Date, Time, Analyst
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ENVIRONMENTAL MICROBIOLOGY

COLIFORM-MF	SM 9222B	<1 col/100ml	1 col/100ml	04/02/11 12:35PM ARD
STANDARD PLATE COUNT	SM 9215B	117 col/ml	2 col/ml	04/02/11 11:10AM CAS

FIELD SERVICES

CHLORINE RESIDUAL	SM 4500CL G	< 0.02 mg/l	0.02 mg/l	04/01/11 12:18PM JCN
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L3683272-1:

A water supply is considered bacteriologically "SAFE" if no Coliform bacteria are detected. To be considered "SAFE" your report should indicate "<1 col/100ml" or "NEG" for the Coliform Test. If your report indicates a positive result "POS" or a value of one (1) or greater then your supply is "UNSAFE FOR DRINKING" contact your local Health Dept. or QC for advice.

L3683272-2:

A water supply is considered bacteriologically "SAFE" if no Coliform bacteria are detected. To be considered "SAFE" your report should indicate "<1 col/100ml" or "NEG" for the Coliform Test. If your report indicates a positive result "POS" or a value of one (1) or greater then your supply is "UNSAFE FOR DRINKING" contact your local Health Dept. or QC for advice.

L3683272-3:

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L3683272-4:

A water supply is considered bacteriologically "SAFE" if no Coliform bacteria are detected. To be considered "SAFE" your report should indicate "<1 col/100ml" or "NEG" for the Coliform Test. If your report indicates a positive result "POS" or a value of one (1) or greater then your supply is "UNSAFE FOR DRINKING" contact your local Health Dept. or QC for advice.

L3683272-5:

Page 3 of 4

This report is a revision of report number 1726072
Serial Number: 1726485

Thomas J. Hines
Thomas J. Hines, President

① This area is no longer in use and no action will be taken. JWH
08-APR-2011

Exact Copy
AP, 2/2/11

QC Laboratories

Analytical Report

Account No: W05899, CHARLES RIVER LABORATORIES, INC.
Project No: W05899, CHARLES RIVER LABORATORIES, INC.

P.O. No: 6600090617

Inv. No: 1292859
PWSID No:

A water supply is considered bacteriologically "SAFE" if no Coliform bacteria are detected. To be considered "SAFE" your report should indicate "<1 col/100ml" or "NEG" for the Coliform Test. If your report indicates a positive result "POS" or a value of one (1) or greater then your supply is "UNSAFE FOR DRINKING" contact your local Health Dept. or QC for advice.

L3683272-6:

A water supply is considered bacteriologically "SAFE" if no Coliform bacteria are detected. To be considered "SAFE" your report should indicate "<1 col/100ml" or "NEG" for the Coliform Test. If your report indicates a positive result "POS" or a value of one (1) or greater then your supply is "UNSAFE FOR DRINKING" contact your local Health Dept. or QC for advice.

L3683272-7:

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Notes:

- A result of "ND" indicates the concentration of the analyte tested was either not detected or below the RLs.
- Definitions: ND=not detected; NEG=negative; POS=positive; COL=colonies; RLs=laboratory reporting limits; L/A=laboratory accident; TNTC=too numerous to count
- A result marked with "DRY" indicates that the result was calculated and reported on a dry weight basis.
- All analysis, except field tests are conducted in Southampton, PA unless otherwise identified.
- The test pH lab is analyzed upon receipt at the laboratory, the result will not be suitable for regulatory purposes.
- The reported results relate only to the samples.
- QC NELAP ID's: PA 09-00131, NJ PA166, FL E87954, NY 11223, CT PH-0768, DE PA-018, KY 90228, MD 206, EPA PA00018, Bioassay: PA 09-03574, NJ PA034, FL E87953, KS E10373, SC 89021001.
- QC STATE ID's: Wind Gap, NJ PA001, PA 48-01334; E RUTHERFORD NJ02015; Vineland NJ06005; Reading PA 06-03543.
- All samples are collected as "grab" samples unless otherwise identified.
- MCL= is the EPA recommended "maximum contaminant level" for a parameter. PLs=customer specific permit limits.
- The test results meet all requirements of NELAC unless otherwise specified.
- The report shall not be reproduced except in full without the written consent of the laboratory.

Regulatory authorities are assessing substantial fines for testing omissions. Please track your sample collections and results on a weekly, monthly, or quarterly basis to ensure compliance. QC's internet program 'LIVE ACCESS' will provide you with real-time access to collection dates and results. Please contact Customer Service for further information on acquiring LIVE ACCESS.

Approved
Joseph W. Hines
08/17/2011Thomas J. Hines
Thomas J. Hines, President

Exact Copy

MPV 091 DEC 12 11



2425 New Holland Pk., PO Box 12425, Lancaster, PA 17605-2425 • 717-556-2300 Fax: 717-556-2681 • www.lancasterlabs.com

Analysis Report

Page 1 of 2

Sample Description: Sample #1 905 Formulations Lab Grab Water Sample (1)
Semi-AnnualLLI Sample # HW 6193223
LLI Group # 1230776
Account # 02423

Project Name: Semi-Annual

Collected: 01/27/2011 11:36 by JGH

Charles River Laboratories

Submitted: 01/27/2011 16:35

905 Sheehy Dr.

Reported: 04/29/2011 12:04

Morsham PA 19044-1297

FORMU

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Herbicides						
10407	2,4-D	94-75-7	0.42 J	0.15	0.48	1
10407	Delapone	75-99-0	N.D.	0.24	1.2	1
10407	2,4-DB	94-02-6	N.D.	0.29	0.96	1
10407	Dicamba	2918-00-2	N.D.	0.077	0.29	1
10407	Dinoseb	80-85-7	N.D.	0.096	0.48	1
10407	2,4-DB (Dichloroprop)	120-36-5	N.D.	0.15	0.48	1
10407	MCPA	96-74-6	N.D.	320	320	1
10407	MCPP	93-65-2	N.D.	46	190	1
10407	Pentachlorophenol	87-86-5	N.D.	0.026	0.098	1
10407	2,4,5-T	93-78-5	0.042 J	0.014	0.068	1
10407	2,4,5-TP	93-72-1	N.D.	0.0956	0.045	1
Reporting limits were raised due to interference from the sample matrix.						
Pesticides/PCBs						
07572	Aldrin	589-60-2	N.D.	0.0020	0.0098	1
07572	Alpha BHC	519-84-6	N.D.	0.0031	0.0238	1
07572	Beta BHC	519-85-7	N.D.	0.0048	0.0098	1
07572	Gamma BHC - Lindane	58-89-2	N.D.	0.0024	0.0098	1
07572	Chlordane	57-74-9	N.D.	0.009	0.49	1
07572	p,p'-DDE	72-54-8	N.D.	0.0049	0.020	1
07572	p,p'-DDD	72-55-9	N.D.	0.0049	0.020	1
07572	p,p'-DDT	50-29-3	N.D.	0.0049	0.020	1
07572	Delta BHC	315-84-8	N.D.	0.0027	0.0098	1
07572	Dieldrin	69-57-1	N.D.	0.0050	0.020	1
07572	Endosulfan I	559-98-8	N.D.	0.0050	0.0098	1
07572	Endosulfan II	33213-45-9	N.D.	0.011	0.020	1
07572	Endosulfan Sulfate	2031-07-0	N.D.	0.0049	0.020	1
07572	Endrin	72-20-8	N.D.	0.0049	0.020	1
07572	Endrin Aldehyde	7421-93-4	N.D.	0.020	0.098	1
07572	Heptachlor	76-44-8	N.D.	0.0025	0.0098	1
07572	Heptachlor Epoxide	1024-57-3	N.D.	0.0029	0.0098	1
07572	PCB-1016	12674-11-2	N.D.	0.098	0.49	1
07572	PCB-1221	11104-28-2	N.D.	0.26	0.49	1
07572	PCB-1232	11141-14-5	N.D.	0.38	0.49	1
07572	PCB-1242	53469-21-9	N.D.	0.098	0.49	1
07572	PCB-1248	12672-29-6	N.D.	0.098	0.49	1
07572	PCB-1254	11097-69-1	N.D.	0.098	0.49	1
07572	PCB-1260	11096-82-5	N.D.	0.098	0.49	1
07572	Toluene	8001-55-2	N.D.	0.98	2.9	1
Metals						
07035	Arsenic	7440-38-2	N.D.	0.0098	0.0200	1
07046	Barium	7440-29-3	N.D.	0.0060	0.0098	1
07049	Cadmium	7440-43-9	N.D.	0.0020	0.0053	1
07051	Chromium	7440-47-3	N.D.	0.0034	0.0053	1
07055	Lead	7439-92-1	N.D.	0.0069	0.0053	1
07036	Selenium	7782-49-2	N.D.	0.0089	0.0098	1
07088	Silver	7440-22-4	N.D.	0.0023	0.0053	1
07092	Zinc	7440-66-6	N.D.	0.0031	0.0098	1

*This limit was used in the evaluation of the final result

① Previously approved. Report regenerated to provide clarity to data. JGH
9-Sep-2011

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HP/091 Dec 2011



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Analysis Report

Page 2 of 2

Sample Description: Sample #1 905 Formulations Lab Grab Water Sample (1)
Semi-AnnualLLI Sample # WH 6193223
LLI Group # 1230775
Account # 02423

Project Name: Semi-Annual

Collected: 01/27/2011 11:36 by JGH

Charles River Laboratories

905 Sheehy Dr.

Morseham PA 19044-1297

Submitted: 01/27/2011 16:35

Reported: 04/29/2011 12:04

FORM

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Metals						
00259	Mercury	EPA 245.1 rev 3 7439-97-6	mg/l N.D.	mg/l 0.000050	mg/l 0.00020	1
Wet Chemistry						
01505	Bromide	EPA 300.0 24859-67-0	mg/l N.D.	mg/l 2.0	mg/l 2.5	5
00224	Chloride	16807-08-6	1.1 J	1.0	2.0	5
01504	Fluoride	16984-48-8	N.D.	0.30	0.50	5
00368	Nitrate Nitrogen	14797-25-0	N.D.	0.25	0.50	5
01506	Nitrite Nitrogen	14797-65-0	N.D.	0.40	0.50	5
00226	Sulfate	14808-79-8	1.6 J	1.5	5.0	5
EPA 365.3						
00226	Ortho-Phosphate as P	7723-14-0	mg/l N.D.	mg/l 0.030	mg/l 0.090	1

General Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/12

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Tris# Match#	Analysis Date and Time	Analyst	Dilution Factor
10407	Herb water 8151A Master	SW-846 8151A	1 110330016A	02/09/2011 20:47	John W. Perkins	1
07572	Pesticides/PCBs in Water	EPA 608	1 110320001A	02/07/2011 19:24	Jamie L. Brillhart	1
10241	Method 601 Water Extraction	EPA 608	1 110320001A	02/21/2011 11:30	Olivia I. Santiago	1
00916	Water Sample Herbicide Extract	SW-846 8151A	1 110330016A	02/03/2011 08:45	Kerrie A. Freeburn	1
07035	Arsenic	EPA 200.7 rev 4.4	1 110285716003	02/01/2011 13:30	Eric L. Eby	3
07046	Barium	EPA 200.7 rev 4.4	1 110285716003	02/01/2011 13:30	Eric L. Eby	3
07045	Cadmium	EPA 200.7 rev 4.4	1 110285716003	02/01/2011 13:30	Eric L. Eby	3
07051	Chromium	EPA 200.7 rev 4.4	1 110285716003	02/01/2011 13:30	Eric L. Eby	3
07055	Lead	EPA 200.7 rev 4.4	1 110285716003	02/01/2011 13:30	Eric L. Eby	3
07036	Selenium	EPA 200.7 rev 4.4	1 110285716003	02/01/2011 13:30	Eric L. Eby	3
07066	Silver	EPA 200.7 rev 4.4	1 110285716003	02/01/2011 13:30	Eric L. Eby	3
07072	Zinc	EPA 200.7 rev 4.4	1 110285716003	02/01/2011 13:30	Eric L. Eby	3
00259	Mercury	EPA 245.1 rev 3	1 110285716001	01/31/2011 08:29	Danayr Valentin	1
05716	EPA 608 ICF Digest (rob sec)	EPA 200.7 rev 4.4	1 110285716003	01/31/2011 09:20	Denise K. Conner	1
05714	Pb/Wb Hg Digest	EPA 245.1 rev 3	1 110285716001	01/28/2011 15:30	Nelli S. Markarynn	1
01505	Bromide	EPA 300.0	1 11028196601C	01/28/2011 19:30	Ashley M. Adams	5
00224	Chloride	EPA 300.0	1 11028196601C	01/28/2011 19:30	Ashley M. Adams	5
01504	Fluoride	EPA 300.0	1 11028196601C	01/28/2011 19:30	Ashley M. Adams	5
00368	Nitrate Nitrogen	EPA 300.0	1 11028196601C	01/28/2011 19:30	Ashley M. Adams	5
01506	Nitrite Nitrogen	EPA 300.0	1 11028196601C	01/28/2011 19:30	Ashley M. Adams	5
00226	Sulfate	EPA 300.0	1 11028196601C	01/28/2011 19:30	Ashley M. Adams	5
00226	Ortho-Phosphate as P	EPA 365.3	1 1102822601A	01/28/2011 07:25	Denise S. Smith	1

*This limit was used in the evaluation of the final result.

① See page 1 of 2 for more details. JGH 4-Sep-2011

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Analysis Report

Page 1 of 3

Sample Description: Sample #2 905 Analytical Lab Grab Water Sample (1)
Semi-AnnualLLI Sample # WW 6193224
LLI Group # 1230776
Account # 02423

Project Name: Semi-Annual

Collected: 01/27/2011 11:49 by JGH

Charles River Laboratories

905 Sheehy Dr.

Horsham PA 19044-1297

Submitted: 01/27/2011 16:35

Reported: 04/29/2011 12:04

ANA-Y

CAI No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Herbicides						
10407	2,4-D	94-75-7	N.D.	0.15	0.48	1
10407	Dalapon	79-99-0	N.D.	0.24	1.2	1
10407	2,4 DB	94-82-6	N.D.	0.29	0.95	1
10407	Dicamba	1918-08-9	N.D.	0.076	0.29	1
10407	Dimquat	88-85-7	N.D.	0.095	0.48	1
10407	2,4-DB (Dichlorprop)	120-36-5	N.D.	0.15	0.48	1
10407	MCPA	94-74-6	N.D.	290	950	1
10407	MCPB	93-65-2	N.D.	48	190	1
10407	Pentachlorophenol	87-86-5	N.D.	0.026	0.048	1
10407	2,4,5-T	93-76-5	N.D.	0.014	0.048	1
10407	2,4,5-TP	93-73-1	N.D.	0.0095	0.048	1
Pesticides/PCBs						
07572	Aldrin	309-00-2	N.D.	0.0019	0.0095	1
07572	Alpha BHC	319-84-6	N.D.	0.0011	0.0095	1
07572	Beta BHC	319-85-7	N.D.	0.0017	0.0095	1
07572	Gamma BHC - Lindane	58-89-9	N.D.	0.0024	0.0095	1
07572	Chlordane	57-74-2	N.D.	0.007	0.48	1
07572	p,p'-DDD	72-54-8	N.D.	0.0040	0.019	1
07572	p,p'-DDE	72-55-9	N.D.	0.0048	0.019	1
07572	p,p'-DDT	50-29-3	N.D.	0.0048	0.019	1
07572	Delta BHC	319-86-0	N.D.	0.0036	0.0095	1
07572	Dieldrin	60-57-1	N.D.	0.0049	0.029	1
07572	Endosulfan I	959-98-8	N.D.	0.0049	0.0095	1
07572	Endosulfan II	33913-65-9	N.D.	0.010	0.019	1
07572	Endosulfan Sulfate	1831-07-8	N.D.	0.0048	0.019	1
07572	Endrin	72-20-4	N.D.	0.0049	0.019	1
07572	Endrin Aldehyde	7421-93-4	N.D.	0.019	0.095	1
07572	Heptachlor	76-44-8	N.D.	0.0025	0.0095	1
07572	Heptachlor Epoxide	1024-27-1	N.D.	0.0025	0.0095	1
07572	PCB-1016	12674-11-2	N.D.	0.095	0.48	1
07572	PCB-1221	11204-28-2	N.D.	0.26	0.48	1
07572	PCB-1232	11161-16-5	N.D.	0.37	0.48	1
07572	PCB-1249	12469-21-9	N.D.	0.095	0.48	1
07572	PCB-1268	12672-29-6	N.D.	0.095	0.48	1
07572	PCB-1254	11097-69-1	N.D.	0.095	0.48	1
07572	PCB-1260	11088-82-5	N.D.	0.095	0.48	1
07572	Toxaphene	8001-35-2	N.D.	0.95	2.9	1
Metals						
07035	Arsenic	7440-38-2	N.D.	0.0098	0.0200	1
07046	Barium	7440-39-3	N.D.	0.00660	0.0040	1
07049	Cadmium	7440-43-9	N.D.	0.0020	0.0050	1
07051	Chromium	7440-47-3	N.D.	0.0014	0.0150	1
07055	Copper	7139-92-1	N.D.	0.0049	0.0150	1
07036	Selenium	7782-49-2	N.D.	0.0085	0.0200	1
07066	Silver	7143-72-1	N.D.	0.0023	0.0050	1
07072	Zinc	7440-66-6	N.D.	0.0081	0.0200	1
EPA 215.1 rev 3						
			mg/l	mg/l	mg/l	

*This limit was used in the evaluation of the final result

① Previously approved. Report regenerated to provide clarity to data. JGH 9 Sep 2011.

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4/10/09/ DEC/2011



Analysis Report

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Page 2 of 3

Sample Description: Sample #2 905 Analytical Lab Grab Water Sample ①
Semi-AnnualLLI Sample # WH 6193224
LLI Group # 1230776
Account # 02423

Project Name: Semi-Annual

Collected: 01/27/2011 11:49 by JGH

Charles River Laboratories

905 Sheehy Dr.

Horsham PA 19044-1297

Submitted: 01/27/2011 16:35

Reported: 04/29/2011 12:04

ANA-Y

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit*	As Received Limit of Quantitation	Dilution Factor
Metals						
00259	Mercury	EPA 245.1 rev 3 7439-97-6	mg/L N.D.	mg/L 0.000050	mg/L 0.00020	1
Wet Chemistry						
01505	Bromide	EPA 300.0 24959-67-8	mg/L N.D.	mg/L 2.0	mg/L 2.5	5
00224	Chloride	16887-83-8	N.D.	1.0	2.0	5
01504	Fluoride	16984-48-6	N.D.	0.40	0.50	5
00360	Nitrate Nitrogen	14797-55-8	N.D.	0.25	0.50	5
01506	Nitrite Nitrogen	14797-65-0	N.D.	0.40	0.50	5
00220	Sulfate	14808-79-8	3.0 J	1.5	5.0	5
EPA 365.3						
00226	Ortho-Phosphate as P	7723-14-0	mg/L N.D.	mg/L 0.030	mg/L 0.090	1

General Sample Comments

PA DSP Lab Certification ID 16-06037, Expiration Date: 1/31/12

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10407	Herb water @51A Master	SM-046 8151A	1	110330018A	02/07/2011 23:55	Michele D Hamilton	1
07572	Pesticides/PCBs in Water	EPA 808	1	110320001A	02/07/2011 19:46	Jamie L. Millhart	1
10241	Method 608 Water Extraction	EPA 808	1	110320001A	02/01/2011 11:30	Glavinia I Santiago	1
00816	Water Sample Herbicide Extract	SM-816 8151A	1	110330018A	02/03/2011 09:45	Kerrie A. Freeburn	1
07035	Arsenic	EPA 200.7 rev 4.4	1	110285716003	02/01/2011 13:33	Eric L. Eby	1
07065	Barium	EPA 200.7 rev 4.4	1	110285716003	02/01/2011 13:35	Eric L. Eby	1
07063	Cadmium	EPA 200.7 rev 4.4	1	110285716003	02/01/2011 13:35	Eric L. Eby	1
07051	Chromium	EPA 200.7 rev 4.4	1	110285716003	02/01/2011 13:33	Eric L. Eby	1
07055	Lead	EPA 200.7 rev 4.4	1	110285716003	02/01/2011 13:35	Eric L. Eby	1
07036	Selenium	EPA 200.7 rev 4.4	1	110285716003	02/01/2011 13:35	Eric L. Eby	1
07065	Silver	EPA 200.7 rev 4.4	1	110285716003	02/01/2011 13:35	Eric L. Eby	1
07072	Zinc	EPA 200.7 rev 4.4	1	110285716003	02/01/2011 13:35	Eric L. Eby	1
00259	Mercury	EPA 245.1 rev 3	1	110285714001	01/31/2011 08:33	Tatiana Valentin	1
00716	EPA 600 ICP Digest (tot spec)	EPA 200.7 rev 4.4	1	110285716003	01/31/2011 09:20	Denise K. Connor	1
00714	PW/VW Hg Digest	EPA 245.1 rev 3	1	110285714001	01/28/2011 15:30	Nelli S. Markaryan	1
01505	Bromide	EPA 300.0	1	11028196601C	01/28/2011 19:45	Ashley M. Adams	5
00224	Chloride	EPA 300.0	1	11028196601C	01/28/2011 19:45	Ashley M. Adams	5
01504	Fluoride	EPA 300.0	1	11028196601C	01/28/2011 19:45	Ashley M. Adams	5
00360	Nitrate Nitrogen	EPA 300.0	1	11028196601C	01/28/2011 19:45	Ashley M. Adams	5
01506	Nitrite Nitrogen	EPA 300.0	1	11028196601C	01/28/2011 19:45	Ashley M. Adams	5
00220	Sulfate	EPA 300.0	1	11028196601C	01/28/2011 19:45	Ashley M. Adams	5

*This limit was used in the evaluation of the final result

① See page 1 of 3 for more details. JGH 9-Sep-2011.

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Analysis Report

Page 3 of 3

Sample Description: Sample #2 905 Analytical Lab Grab Water Sample (1)
Semi-AnnualLLI Sample # WW 6193224
LLI Group # 1230776
Account # 02423

Project Name: Semi-Annual

Collected: 01/27/2011 11:49 by JGH

Charles River Laboratories

Submitted: 01/27/2011 16:35

905 Shreehy Dr.

Reported: 04/29/2011 12:04

Horsham PA 19044-1297

ANA-Y

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trials	Batch#	ANALYSIS Date and Time	ANALYST	Dilution Factor
00226	Ortho-Phosphate as P	EPA 365.3	1	11029022601A	01/29/2011 07:25	Daniel S. Smith	1

*This limit was used in the evaluation of the final result

① See page 1 of 3 for more details. JGH 9-Sep-2011.



Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

N.D.	none detected	BMQL	Below Minimum Quantitation Level
TNTC	Too Numerous To Count	MPN	Most Probable Number
IU	International Units	CP Units	cobalt-chloroplatinate units
umhos/cm	micromhos/cm	NTU	nephelometric turbidity units
C	degrees Celsius	F	degrees Fahrenheit
meq	milliequivalents	lb.	pound(s)
g	gram(s)	kg	kilogram(s)
ug	microgram(s)	mg	milligram(s)
ml	milliliter(s)	l	liter(s)
m3	cubic meter(s)	ul	microliter(s)
<	less than - The number following the sign is the <u>limit of quantitation</u> , the smallest amount of analyte which can be reliably determined using this specific test.		
>	greater than		
J	estimated value - The result is \geq the Method Detection Limit (MDL) and $<$ the Limit of Quantitation (LOQ).		
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter of gas per liter of gas.		
ppb	parts per billion		
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

U.S. EPA CLP Data Qualifiers:

Organic Qualifiers		Inorganic Qualifiers	
A	TIC is a possible aldol-condensation product	B	Value is $<$ CRDL, but \geq IDL
B	Analyte was also detected in the blank	E	Estimated due to interference
C	Pesticide result confirmed by GC/MS	M	Duplicate Injection precision not met
D	Compound quantitated on a diluted sample	N	Spike sample not within control limits
E	Concentration exceeds the calibration range of the instrument	S	Method of standard additions (MSA) used for calculation
N	Presumptive evidence of a compound (TICs only)	U	Compound was not detected
P	Concentration difference between primary and confirmation columns $>25\%$	W	Post digestion spike out of control limits
U	Compound was not detected	*	Duplicate analysis not within control limits
X,Y,Z	Defined in case narrative	+	Correlation coefficient for MSA <0.995

Analytical test results for methods listed on the laboratories' accreditation scope meet all requirements of NELAC unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.

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ENRICHMENT ANALYSIS

N-PAL
NP ANALYTICAL
LABORATORIESA Nestlé Purina PetCare Company
Checkerboard Square • St. Louis, MO 63164**ANALYSIS REPORT**To: JACKY JUDD (FS)
ANIMAL SPECIALTIES
2400 MILFORD SQUARE PIKE
QUAKERTOWN PA 18951

CC:

Page 1 of 2

DUPLICATE
*APR 28 2010*Sample No.: L1015045-1 Receipt Date: 04/16/2010
Report Date: 04/28/2010

NYLABONE PETITE BONE, LOT 4/12/10

Test Code	Assay / Analyte	Result	Units
AS	Arsenic	< 0.20	ppm
CDF	Cadmium	< 0.0500	ppm
PB	Lead	< 0.0500	ppm
ORGP	Organophosphate pesticides		
	Diazinon	< 0.0200	ppm
	Disulfoton	< 0.0200	ppm
	Ethion	< 0.0200	ppm
	Malathion	< 0.0200	ppm
	Methyl Parathion	< 0.0200	ppm
	Parathion	< 0.0200	ppm
	Thimet	< 0.0200	ppm
	Thiodan	< 0.0200	ppm
	Trithion	< 0.0200	ppm
RSPB	Organochlorine pest.&PCB's		
	Heptachlor Epoxide	< 0.0200	ppm
	Heptachlor	< 0.0200	ppm
	DDE	< 0.0200	ppm
	Lindane	< 0.0200	ppm
	Endrin	< 0.0200	ppm

*Approved
Joseph H.
12-JAN-2011*

Person responsible for report content: Lynn Loudermillk, Director.

The test code located next to each assay is a method reference code. Results are for samples submitted only. This report shall not be reproduced, except in its entirety, without the written permission of NP Analytical Laboratories.

For additional information, contact Customer Services at 800-423-6832 or 314-982-1310.

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CH2010042819350168

The symbol "<" or the words "less than" signifies that no analyte was measured at or above the stated lower limit of quantitation of the procedure under the conditions employed. The use of the symbol "<" or the words "less than" does not imply that traces of the analyte were present. The symbol ">" or the term "greater than" signifies that the analyte was determined to be present in an amount greater than the stated level. Samples submitted to NP Analytical Laboratories for testing are retained for a minimum of thirty (30) days after the analysis report is issued when sample stability permits. Requests for extended storage must be made to NP Analytical Laboratories prior to or at the time of sample submission.

N•PAL
NP ANALYTICAL
LABORATORIESA Nestle Purina PetCare Company
Checkerboard Square • St. Louis, MO 63164

Sample No.: L1015045-1

Received: 04/16/2010

Page 2 of 2

Reported: 04/28/2010

NYLABONE PETTIE BONE, LOT 4/12/10

DUPLICATE
APL 4/28/10

Test Code	Assay / Analyte	Result	Units
RSPB	Organochlorine pest.&PCB's	Mirex	< 0.0200 ppm
		Alpha-BHC	< 0.0200 ppm
		Delta-BHC	< 0.0200 ppm
		Aldrin	< 0.0200 ppm
		Dieldrin	< 0.0200 ppm
		DDT	< 0.0200 ppm
		Chlordane	< 0.0200 ppm
		Methoxychlor	< 0.0200 ppm
		Beta-BHC	< 0.0200 ppm
		HCB	< 0.0200 ppm
		PCB	< 0.150 ppm
AFTX	Aflatoxin screen, ELISA	Aflatoxins	< 5.0 ppb

*Approved.
Lynne W. Lh
12-Nov-2010***REVIEWED BY**

Person responsible for report content: Lynn Loudermilk, Director.

The test code located next to each assay is a method reference code. Results are for samples submitted only. This report shall not be reproduced, except in its entirety, without the written permission of NP Analytical Laboratories.

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CH2010042819350169

The symbol "<" or the words "less than" signifies that no analyte was measured at or above the stated lower limit of quantitation of the procedure under the conditions employed. The use of the symbol "<" or the words "less than" does not imply that traces of the analyte were present. The symbol ">" or the term "greater than" signifies that the analyte was determined to be present in an amount greater than the stated level. Samples submitted to NP Analytical Laboratories for testing are retained for a minimum of thirty (30) days after the analysis report is issued when sample stability permits. Requests for extended storage must be made to NP Analytical Laboratories prior to or at the time of sample submission.

APPENDIX 5 - OPHTHALMOLOGICAL REPORT



FINAL REPORT

Study Phase: Ophthalmology Evaluation

Testing Facility Study No. TQC00066

**Oral (Diet) Repeated Dose 90-Day Toxicity Study of Malathion
Technical in Rats**

SPONSOR:

Cheminova A/S
P.O. Box 9
DK-7620 Lemvig
DENMARK

TESTING FACILITY:

Charles River Laboratories
Preclinical Services, Pennsylvania (PCS-PA)
905 Sheehy Dr., Building A
Horsham, PA 19044
United States

09 August 2011

Page 1 of 18

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3. COMPLIANCE STATEMENT

The ophthalmology evaluation phase of this study was performed in compliance with the following Good Laboratory Practice (GLP) regulations:

- U.S. Environmental Protection Agency. Federal Insecticide, Fungicide and Rodenticide Act/Toxic Substances Control Act (FIFRA/TSCA); Good laboratory practice standards; Final Rule 40 C.F.R Part 160/792; August 17, 1989.

This phase of the study was conducted in accordance with the procedures described herein. The report represents an accurate and complete record of the results obtained. There were no deviations from the above regulations that affected the overall integrity of the study or the interpretation of the phase results and conclusions.

Audited Final Ophthalmology Evaluation Report

Page 5
Testing Facility Study No. TQC00066**4. QUALITY ASSURANCE STATEMENT**

Protocol: TQC00066

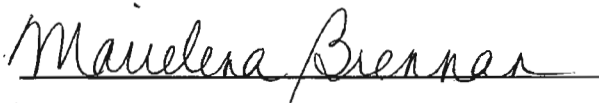
This study has been inspected by the QAU to assure conformance with the GLP regulations US Environmental Protection Agency, Good Laboratory Practice Regulations, Final Rule, 40 CFR Part 160/792. Reports were submitted in accordance with SOPs as follows.

QAU INSPECTION DATES


		<u>Dates Findings Submitted to:</u>	
Dates of Inspection	Phase(s) Inspected	Study Director	Study Director Management
14 Apr 2011	Ophthalmology Exams	14 Apr 2011	14 Apr 2011
25 Jul 2011	Ophthalmology Data	25 Jul 2011	25 Jul 2011
25 Jul 2011	Ophthalmology Report	25 Jul 2011	25 Jul 2011
09 Aug 2011	Final Report	09 Aug 2011	09 Aug 2011

In addition to the above-mentioned inspections, process-based and/or routine facility inspections were also conducted during the course of this study. Inspection findings, if any, specific to this study were reported by the QAU to the Study Director and Management and listed as a phase inspected on this QA Statement.

The Final Report has been reviewed to assure that it accurately describes the materials and methods, and that the reported results accurately reflect the raw data.



Marielena Brennan, BS
Quality Assurance Auditor II
Charles River Laboratories
Preclinical Services, Pennsylvania



Date

5. INTRODUCTION

This report presents the ophthalmology evaluations in rats assigned to the study entitled “Oral (Diet) Repeated Dose 90-Day Toxicity Study of Malathion Technical in Rats” (Study No. TQC00066). The objective of this study was to provide information on possible adverse effects on Crl:CD(SD) rats resulting from repeated exposure to Malathion over an extended period of time covering postweaning maturation and growth well into adulthood. The study was designed to provide information on toxicity, indicate target organs and the possibility of accumulation, and was also designed to provide an estimate of a no-observed-adverse-effect level (NOAEL) of exposure that could be used for establishing safety criteria for human exposure.

The study was sponsored by Cheminova A/S, Denmark. John F. Barnett, Jr., B.S. (Senior Research Scientist) served as the Study Director.

The evaluations were performed by Michael H. Brown, DVM, MS, DACVO, Montclair, NJ for all rats assigned to the main study prior to assignment to study and prior to sacrifice.

This study phase was started on 14 Jan 2011 and completed on 14 Apr 2011.

6. MATERIALS AND METHODS

Experimental procedures applicable to ophthalmology evaluations are summarized in [Text Table 1](#).

Text Table 1
Experimental Design

Group No.	No. of Main Study Animals		Test Material	Concentration (ppm)
	Male	Female		
I	10	10	Carrier Control	0
II	10	10	Malathion	100
III	10	10	Malathion	500
IV	10	10	Malathion	5000
V	10	10	Malathion	10000

6.1. Ophthalmic Examinations

Frequency: Once before assignment to study and once prior to sacrifice on Days 84 through 87 of Study.

Procedure: An indirect ophthalmoscope in conjunction with a hand-held lens (60 D [diopter]) was used to examine ocular structures (lens and fundus oculi).

The mydriatic solution used was 1% tropicamide ophthalmic solution.

6.2. Disposition of Study Materials

All study-specific raw data, documentation and Final Report generated from this study phase will be archived at the Testing Facility. Study materials will be retained for a period of 1 year following issue of the audited Final Report.

7. RESULTS AND DISCUSSION

(Table 1, Table 2, and Appendix 1 and Appendix 2)

7.1. Prior to Study Assignment

Text Table 3
Summary Ophthalmic Findings

Animal No.	Sex	Site/Eye	Observation
15	Male	L	Vitreous Hemorrhage
98	Male	L	Hyphema
74	Female	B	Cataract
105	Female	R	Vitreous Degeneration

L = Left; R = Right; B = Both.

Ophthalmic findings of vitreous hemorrhage, hyphema, cataract, and vitreous degeneration were noted for rats 15, 98, 74, and 105, respectively. These rats should not be used on study.

7.2. Prior to Sacrifice

No test substance-related ophthalmic findings were noted. The ophthalmic findings observed were considered incidental, of the nature commonly observed in this strain and age of rats, and/or were of comparable incidence in control and treated animals and, therefore, were considered unrelated to administration of Malathion.

Text Table 3
Summary Ophthalmic Findings – Days 84 through 87 of Study

Observation	Animal No.	Sex	Dosage Level	Site/Eye
Retinal Degeneration	3960	Female	5000	R

R = Right.

8. CONCLUSIONS

Dietary exposure of Malathion to rats for 90 consecutive days at concentrations of 0 (Carrier Control), 100, 500, 5000, or 10000 ppm did not result in any test substance-related ophthalmic changes.

9. REPORT APPROVAL

Michael H. Brown
Michael H. Brown, DVM, MS, DACVO
Veterinary Ophthalmologist

Date: 09 Aug 11

Table 1
Incidence of Ophthalmic Findings - Summary - Male Rats - Main Study

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 1 (PAGE 1): INCIDENCE OF OPHTHALMIC FINDINGS - SUMMARY - MALE RATS - MAIN STUDY

DOSAGE GROUP CONCENTRATION (PPM) a		I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS EXAMINED (DAY 86 OR 87 OF STUDY)	N	10	10	10	10	10
EYES EXAMINED	N	20	20	20	20	20

NO ADVERSE OPHTHALMOLOGICAL FINDINGS WERE OBSERVED

ALL EYE OBSERVATIONS APPEARED NORMAL PRIOR TO DOSAGE ADMINISTRATION.

N1 = RATS AFFECTED N2 = EYES AFFECTED

a. Rats were given continual access to the carrier control or test substance in the diet.

Table 2
Incidence of Ophthalmic Findings - Summary - Female Rats - Main Study

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 2 (PAGE 1): INCIDENCE OF OPHTHALMIC FINDINGS - SUMMARY - FEMALE RATS - MAIN STUDY

DOSAGE GROUP CONCENTRATION (PPM) ^a		I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS EXAMINED (DAY 84 OR 85 OF STUDY)	N	10	10	10	10	10
EYES EXAMINED	N	20	20	20	20	20
RETINAL DEGENERATION	N1 (N2)	0 (0)	0 (0)	0 (0)	1 (1)	0 (0)

ALL EYE OBSERVATIONS APPEARED NORMAL PRIOR TO DOSAGE ADMINISTRATION.

N1 = RATS AFFECTED N2 = EYES AFFECTED

a. Rats were given continual access to the carrier control or test substance in the diet.

Appendix 1
Individual Ophthalmic Findings - Male Rats - Main Study

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

APPENDIX 1 (PAGE 1): INDIVIDUAL OPHTHALMIC FINDINGS - MALE RATS - MAIN STUDY

RAT #			DESCRIPTION		
DOSAGE GROUP I			0 (CARRIER CONTROL) PPM		
3776	DS (	87)	EYE OBSERVATION:	APPEARED	NORMAL
3777	DS (	87)	EYE OBSERVATION:	APPEARED	NORMAL
3778	DS (	87)	EYE OBSERVATION:	APPEARED	NORMAL
3779	DS (	87)	EYE OBSERVATION:	APPEARED	NORMAL
3780	DS (	87)	EYE OBSERVATION:	APPEARED	NORMAL
3781	DS (	86)	EYE OBSERVATION:	APPEARED	NORMAL
3782	DS (	86)	EYE OBSERVATION:	APPEARED	NORMAL
3783	DS (	86)	EYE OBSERVATION:	APPEARED	NORMAL
3784	DS (	86)	EYE OBSERVATION:	APPEARED	NORMAL
3785	DS (	86)	EYE OBSERVATION:	APPEARED	NORMAL
DOSAGE GROUP II			100 PPM		
3726	DS (	87)	EYE OBSERVATION:	APPEARED	NORMAL
3727	DS (	87)	EYE OBSERVATION:	APPEARED	NORMAL
3728	DS (	87)	EYE OBSERVATION:	APPEARED	NORMAL
3729	DS (	87)	EYE OBSERVATION:	APPEARED	NORMAL
3730	DS (	87)	EYE OBSERVATION:	APPEARED	NORMAL
3731	DS (	86)	EYE OBSERVATION:	APPEARED	NORMAL
3732	DS (	86)	EYE OBSERVATION:	APPEARED	NORMAL
3733	DS (	86)	EYE OBSERVATION:	APPEARED	NORMAL
3734	DS (	86)	EYE OBSERVATION:	APPEARED	NORMAL
3735	DS (	86)	EYE OBSERVATION:	APPEARED	NORMAL
DOSAGE GROUP III			500 PPM		
3801	DS (	87)	EYE OBSERVATION:	APPEARED	NORMAL
3802	DS (	87)	EYE OBSERVATION:	APPEARED	NORMAL
3803	DS (	87)	EYE OBSERVATION:	APPEARED	NORMAL
3804	DS (	87)	EYE OBSERVATION:	APPEARED	NORMAL
3805	DS (	87)	EYE OBSERVATION:	APPEARED	NORMAL
12250	DS (	86)	EYE OBSERVATION:	APPEARED	NORMAL
3807	DS (	86)	EYE OBSERVATION:	APPEARED	NORMAL
3808	DS (	86)	EYE OBSERVATION:	APPEARED	NORMAL
3809	DS (	86)	EYE OBSERVATION:	APPEARED	NORMAL
3810	DS (	86)	EYE OBSERVATION:	APPEARED	NORMAL

ALL EYE OBSERVATIONS APPEARED NORMAL PRIOR TO DOSAGE ADMINISTRATION.
DS = DAY OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

APPENDIX 1 (PAGE 2): INDIVIDUAL OPHTHALMIC FINDINGS - MALE RATS - MAIN STUDY

RAT #			DESCRIPTION	
DOSAGE GROUP IV			5000 PPM	
3751	DS (	87)	EYE OBSERVATION:	APPEARED NORMAL
3752	DS (	87)	EYE OBSERVATION:	APPEARED NORMAL
3753	DS (	87)	EYE OBSERVATION:	APPEARED NORMAL
3754	DS (	87)	EYE OBSERVATION:	APPEARED NORMAL
3755	DS (	87)	EYE OBSERVATION:	APPEARED NORMAL
3756	DS (	86)	EYE OBSERVATION:	APPEARED NORMAL
3757	DS (	86)	EYE OBSERVATION:	APPEARED NORMAL
3758	DS (	86)	EYE OBSERVATION:	APPEARED NORMAL
3759	DS (	86)	EYE OBSERVATION:	APPEARED NORMAL
3760	DS (	86)	EYE OBSERVATION:	APPEARED NORMAL
DOSAGE GROUP V			10000 PPM	
3701	DS (	87)	EYE OBSERVATION:	APPEARED NORMAL
18077	DS (	87)	EYE OBSERVATION:	APPEARED NORMAL
3703	DS (	87)	EYE OBSERVATION:	APPEARED NORMAL
3704	DS (	87)	EYE OBSERVATION:	APPEARED NORMAL
3705	DS (	87)	EYE OBSERVATION:	APPEARED NORMAL
3706	DS (	86)	EYE OBSERVATION:	APPEARED NORMAL
3707	DS (	86)	EYE OBSERVATION:	APPEARED NORMAL
3708	DS (	86)	EYE OBSERVATION:	APPEARED NORMAL
3709	DS (	86)	EYE OBSERVATION:	APPEARED NORMAL
3710	DS (	86)	EYE OBSERVATION:	APPEARED NORMAL

ALL EYE OBSERVATIONS APPEARED NORMAL PRIOR TO DOSAGE ADMINISTRATION.
DS = DAY OF STUDY

Appendix 2
Individual Ophthalmic Findings - Female Rats - Main Study

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

APPENDIX 2 (PAGE 1): INDIVIDUAL OPHTHALMIC FINDINGS - FEMALE RATS - MAIN STUDY

RAT #			DESCRIPTION		
DOSAGE GROUP I			0 (CARRIER CONTROL) PPM		
3901	DS (	85)	EYE OBSERVATION:	APPEARED	NORMAL
3902	DS (	85)	EYE OBSERVATION:	APPEARED	NORMAL
3903	DS (	85)	EYE OBSERVATION:	APPEARED	NORMAL
3904	DS (	85)	EYE OBSERVATION:	APPEARED	NORMAL
3905	DS (	85)	EYE OBSERVATION:	APPEARED	NORMAL
3906	DS (	84)	EYE OBSERVATION:	APPEARED	NORMAL
3907	DS (	84)	EYE OBSERVATION:	APPEARED	NORMAL
3908	DS (	84)	EYE OBSERVATION:	APPEARED	NORMAL
3909	DS (	84)	EYE OBSERVATION:	APPEARED	NORMAL
3910	DS (	84)	EYE OBSERVATION:	APPEARED	NORMAL
DOSAGE GROUP II			100 PPM		
3851	DS (	85)	EYE OBSERVATION:	APPEARED	NORMAL
3852	DS (	85)	EYE OBSERVATION:	APPEARED	NORMAL
3853	DS (	85)	EYE OBSERVATION:	APPEARED	NORMAL
3854	DS (	85)	EYE OBSERVATION:	APPEARED	NORMAL
3855	DS (	85)	EYE OBSERVATION:	APPEARED	NORMAL
3856	DS (	84)	EYE OBSERVATION:	APPEARED	NORMAL
3857	DS (	84)	EYE OBSERVATION:	APPEARED	NORMAL
3858	DS (	84)	EYE OBSERVATION:	APPEARED	NORMAL
3859	DS (	84)	EYE OBSERVATION:	APPEARED	NORMAL
3860	DS (	84)	EYE OBSERVATION:	APPEARED	NORMAL
DOSAGE GROUP III			500 PPM		
3926	DS (	85)	EYE OBSERVATION:	APPEARED	NORMAL
3927	DS (	85)	EYE OBSERVATION:	APPEARED	NORMAL
3928	DS (	85)	EYE OBSERVATION:	APPEARED	NORMAL
3929	DS (	85)	EYE OBSERVATION:	APPEARED	NORMAL
3930	DS (	85)	EYE OBSERVATION:	APPEARED	NORMAL
3931	DS (	84)	EYE OBSERVATION:	APPEARED	NORMAL
3932	DS (	84)	EYE OBSERVATION:	APPEARED	NORMAL
3933	DS (	84)	EYE OBSERVATION:	APPEARED	NORMAL
3934	DS (	84)	EYE OBSERVATION:	APPEARED	NORMAL
3935	DS (	84)	EYE OBSERVATION:	APPEARED	NORMAL

ALL EYE OBSERVATIONS APPEARED NORMAL PRIOR TO DOSAGE ADMINISTRATION.
DS = DAY OF STUDY

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

APPENDIX 2 (PAGE 2): INDIVIDUAL OPHTHALMIC FINDINGS - FEMALE RATS - MAIN STUDY

RAT #			DESCRIPTION
DOSAGE GROUP IV			5000 PPM
3951	DS(	85)	EYE OBSERVATION: APPEARED NORMAL
3952	DS(	85)	EYE OBSERVATION: APPEARED NORMAL
3953	DS(	85)	EYE OBSERVATION: APPEARED NORMAL
3954	DS(	85)	EYE OBSERVATION: APPEARED NORMAL
3955	DS(	85)	EYE OBSERVATION: APPEARED NORMAL
3956	DS(	84)	EYE OBSERVATION: APPEARED NORMAL
3957	DS(	84)	EYE OBSERVATION: APPEARED NORMAL
3958	DS(	84)	EYE OBSERVATION: APPEARED NORMAL
3959	DS(	84)	EYE OBSERVATION: APPEARED NORMAL
3960	DS(	84)	RIGHT EYE: RETINAL DEGENERATION
DOSAGE GROUP V			10000 PPM
3876	DS(	85)	EYE OBSERVATION: APPEARED NORMAL
3877	DS(	85)	EYE OBSERVATION: APPEARED NORMAL
3878	DS(	85)	EYE OBSERVATION: APPEARED NORMAL
3879	DS(	85)	EYE OBSERVATION: APPEARED NORMAL
3880	DS(	85)	EYE OBSERVATION: APPEARED NORMAL
3881	DS(	84)	EYE OBSERVATION: APPEARED NORMAL
3882	DS(	84)	EYE OBSERVATION: APPEARED NORMAL
3883	DS(	84)	EYE OBSERVATION: APPEARED NORMAL
3884	DS(	84)	EYE OBSERVATION: APPEARED NORMAL
3885	DS(	84)	EYE OBSERVATION: APPEARED NORMAL

ALL EYE OBSERVATIONS APPEARED NORMAL PRIOR TO DOSAGE ADMINISTRATION.

DS = DAY OF STUDY

APPENDIX 6 - ANALYTICAL REPORT



FINAL REPORT

Study Phase: Diet Analysis

Testing Facility Study No. TQC00066

Oral (Diet) Repeated Dose 90-Day Toxicity Study of Malathion Technical in Rats

AUTHOR:

Jason Sarsoza, BSc
(Principal Investigator)

SPONSOR:

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P.O. Box 9
DK-7620 Lemvig
Denmark

TESTING FACILITY:

Charles River Laboratories
Preclinical Services, Pennsylvania (PCS-PA)
905 Sheehy Dr., Building A
Horsham, PA 19044
United States

December 9, 2011

Page 1 of 57

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3. COMPLIANCE STATEMENT

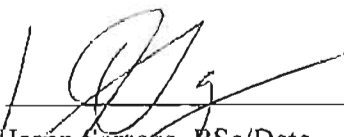
This phase of this study performed by PCS-PA was conducted in compliance with the following Good Laboratory Practice (GLP) regulations.

- United States Code of Federal Regulations, Title 40, Parts 160 and 792: Good Laboratory Practice Standards.
- The Organisation for Economic Cooperation and Development (OECD) Principles on Good Laboratory Practice (C[97]186/Final).

This phase of this study was conducted in accordance with the procedures described herein. All deviations authorized/acknowledged by the Principal Investigator and Study Director are documented in the Study Records. The report represents an accurate and complete record of the results obtained.

There were no deviations from the above regulations that affected the overall integrity of the study or the interpretation of the study results and conclusions.

Principal Investigator:



09 DEC 2011

Jason Sarsoza, BSc/Date
Research Scientist I, Laboratory Sciences
Charles River Laboratories Preclinical Services

4. QUALITY ASSURANCE STATEMENT

This study has been inspected by the QAU to assure conformance with the GLP regulations US Environmental Protection Agency, Good Laboratory Practice Regulations, Final Rule, 40 CFR Part 160/792 and the Organisation for Economic Co-operation and Development (1998), The Revised OECD Principles of Good Laboratory Practices [C(97)186/Final]. Reports were submitted in accordance with SOPs as follows.

QAU INSPECTION DATES

Dates of Inspection	Phase(s) Inspected	Study Director	<u>Dates Findings Submitted to:</u>
			Study Director Management
11 Feb 2011	Instrument Set-Up	11 Feb 2011	11 Feb 2011
20 & 22 Jun 2011	Analytical Data	24 Jun 2011	24 Jun 2011
20 & 22 Jun 2011	Analytical Report	24 Jun 2011	24 Jun 2011
09 Dec 2011	Final Report	09 Dec 2011	09 Dec 2011

In addition to the above-mentioned inspections, process-based and/or routine facility inspections were also conducted during the course of this study. Inspection findings, if any, specific to this study were reported by the QAU to the Study Director and Management and listed as a phase inspected on this QA Statement.

The Final Report has been reviewed to assure that it accurately describes the materials and methods, and that the reported results accurately reflect the raw data.



Brandon Tobias,, BS
Quality Assurance Auditor I
Charles River Laboratories
Preclinical Services, Pennsylvania



Date

5. RESPONSIBLE PERSONNEL

Principal Investigator

Jason Sarsoza, BSc
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Julian, Gulbinski III, BS, MBA
Charles River Laboratories, PCS-PA

Vice President, Laboratory Sciences
North America

Alan Bartlett, CChem, FRSC

Director of Operations

Matthew J. Vaneman, BS

6. INTRODUCTION

The purpose of this project was to determine the concentration and homogeneity of Malathion in diet mixtures from Study No. TQC00066 titled “*Oral (Diet) Repeated Dose 90-Day Toxicity Study of Malathion Technical in Rats.*”

The study was sponsored by Cheminova A/S, Lemvig Denmark, where M. Jensen served as the Sponsor Study Monitor. John F. Barnett, Jr., BS, Charles River Laboratories Preclinical Services, Horsham, PA served as the Study Director. Jason Sarsoza, BSc, Charles River Laboratories Preclinical Services, Horsham, PA served as the Principal Investigator for this study phase.

This study phase was started on 13 January 2011 and completed on 13 April 2011.

7. MATERIALS AND METHODS

7.1. Analytical Reference Standard 1

Identity:	Malathion Analytical Standard
Batch/Lot No.:	650-OSJ-36E
Expiration Date:	01 March 2018
Purity:	99.6% w/w
Storage Conditions:	-15°C to -30°C, protected from light
Manufacturer/Supplier:	Cheminova A/S

7.2. Analytical Reference Standard 2

Identity:	Malathion Technical
Batch/Lot No.:	D2014-OSJ-MLT-01-S
Expiration Date:	28 September 2013
Purity:	95.8%
Storage Conditions:	2°C to 8°C, protected from light
Manufacturer/Supplier:	Cheminova A/S

The Sponsor provided to the Testing Facility documentation of the identity, strength, purity, composition, and stability for the reference standard. Certificates of Analysis were provided to the Testing Facility and are presented in [Appendix 2](#).

7.3. Sample Receipt and Storage

Seven set of samples were received from the Testing Facility. The first set was received on 12 January 2011, and the last set was received on 11 April 2011. The samples were received ambient, protected from light, except for Week13 samples which were received ambient, and in satisfactory condition. Samples were stored at 2°C to 8°C, protected from light, except for Week13 samples which were stored 2°C to 8°C, and analyzed within the established stability period (22 days).

Week 7 samples were received but, were not analyzed. Due to an error samples from Week 11 were analyzed; the results were not reported due to poor chromatography.

7.4. Sample Analysis

Samples of dose formulations were analyzed for Malathion according to the validated method described in PCS-PA Analytical Procedure MALA02 for the “*Analysis of Malathion in Meal Form of Certified Rodent Diet # 5002 Containing 5% Corn Oil Dose Formulations by HPLC-UV.*” A copy of the most recent version of the Analytical Procedure is contained in [Appendix 3](#).

7.5. Reference Standard Inventory and Disposition

Records of the receipt, distribution, and storage of the reference standard were maintained. All unused reference standard will be maintained for use in future studies.

8. COMPUTERIZED SYSTEMS

TotalChrom[®], Version 6.2.1 (PerkinElmer[®]) software was used for acquisition of HPLC data, assessment of system suitability, and integration of the peak area of the analyte. After integration of the peak areas, data were exported to a verified Excel[®] [part of Microsoft[®] Office 1997 (or later versions)] spreadsheet. The Excel spreadsheet was used for regression analysis and calculation of Malathion concentrations and descriptive statistics.

9. STATISTICAL ANALYSIS

Regression analysis and descriptive statistics (such as means and relative standard deviations) were used to determine the dose formulation concentrations and homogeneity.

10. RETENTION OF RECORDS

All study-specific raw data, documentation and the final report from this study phase are the property of the Sponsor. These materials will be available at the Testing Facility during the progress of the study. When the Final Report is issued all study-specific raw data, documentation and the final report will be archived by the Testing Facility for a period of 1 year. After this period, the Sponsor will be contacted to determine the disposition of these materials. Archival material will be indexed by Study No. TQC00066.

11. RESULTS

Concentration and homogeneity results are summarized in [Table 1](#). Results and conclusions for each analytical run are provided in the Dose Formulation Analysis Reports, which are contained in [Appendix 4](#).

11.1. Concentration

Mean measured Malathion concentrations for all dose formulations were within the acceptable limits ($\pm 10\%$ of nominal).

11.2. Homogeneity

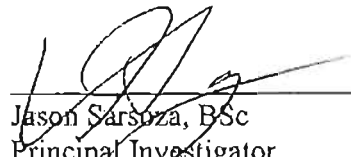
The relative standard deviation (RSD) of the mean of the average concentration values for the top, middle, and bottom of each dose formulation was calculated to assess homogeneity. Homogeneity was acceptable ($\leq 5\%$ RSD) for all dose formulations.

12. CONCLUSIONS

Samples of dose formulations were analyzed for Malathion by high-performance liquid chromatography with ultraviolet detection (HPLC UV). The method was validated for the analysis of dose formulations at concentrations ranging from 40 ppm to 20000 ppm Malathion in meal form of certified rodent diet® # 5002 containing 5% corn oil.

Results for all dose formulations met the acceptance criteria for concentration (within $\pm 10\%$ of nominal concentration) and homogeneity ($\leq 5\%$ relative standard deviation).

13. REPORT APPROVAL



Jason Sarsuza, BSc
Principal Investigator
Charles River Laboratories, PCS-PA

Date: 09 DEC 2011

Table 1
Summary of Concentration and Homogeneity Results

Table 1 Summary of Concentration and Homogeneity Results

Sample (Preparation Date)	Group	Nominal Concentration (ppm)	Mean Measured Concentration (ppm)	Mean Bias (%)	Homogeneity (%RSD)
Week 1 (12 January 2011)	I	0	ND	NA	NA
	II	100	96.33	-3.7	0.8
	III	500	509.1	1.8	3.3
	IV	5000	5183	3.7	4.2
	V	10000	10230	2.3	2.4
Week 3 (26 January 2011)	I	0	ND	NA	-
	II	100	99.79	-0.2	-
	III	500	487.5	-2.5	-
	IV	5000	5059	1.2	-
	V	10000	9967	-0.3	-
Week 5 (10 February 2011)	I	0	ND	NA	-
	II	100	102.9	2.9	-
	III	500	495.1	-1.0	-
	IV	5 000	5034	0.7	-
	V	10000	10200	2.0	-
Week 9 (10 March 2011)	I	0	ND	NA	-
	II	100	95.65	-4.4	-
	III	500	484.7	-3.1	-
	IV	5000	4854	-2.9	-
	V	10000	9475	-5.3	-
Week 13 (08 April 2011)	I	0	ND	NA	-
	II	100	98.24	-1.8	-
	III	500	479.5	-4.1	-
	IV	5000	4 948	-1.0	-
	V	10000	9 988	-0.1	-

RSD Relative standard deviation.

ND None detected.

NA Not applicable.

— Not required.

Appendix 1
Deviations

DEVIATIONS

Week 11 samples were analyzed in error. There is no impact since the results could not be reported due to poor chromatography. Furthermore, the diet mixtures for all other sampling occasions met acceptance criteria for concentration or homogeneity and none of the required raw data were lost as a result of this deviation.

Week 13 samples were not stored protected from light prior to analysis. There is no impact since the test substance exposure to light was minimal once mixed in the diet. Furthermore, the samples met acceptance criteria for concentration and the results of the analysis were not impacted.

Week 13 back up samples were analyzed in error. There is no impact since each concentration level was analyzed in duplicate and replication criteria were met confirming reproducibility of the results.

Appendix 2
Certificates of Analysis



Cheminova A/S
P.O. Box 9
DK-7620 Lemvig
Denmark

Phone (+45) 96 90 96 90
Fax (+45) 96 90 96 91
www.cheminova.com
CVR-No. DK 12 76 00 43

Page 1 of 1

Certificate of Analysis

REF 019-03

Test substance certified:

Test substance:	Analytical standard of Malathion			
Batch No.:	650-OSJ-36E			
Origin of test substance:	<input checked="" type="checkbox"/> Laboratory	<input type="checkbox"/> Pilot plant	<input type="checkbox"/> Commercial	

Analysis:

Content of Malathion:	99.6 % w/w
Identified by:	¹ H-NMR and ¹³ C-NMR Spectroscopy, IR Spectroscopy, UV spectroscopy and Mass Spectrometry
Determination of purity by:	Quantitative ³¹ P-NMR
Date of analysis:	March 1, 2010

Information of the test substance:

Appearance:	Colourless liquid
Storage:	< -20°C
Expiry date:	March 1, 2018

Information of analyte(s):

Common name:	-
CAS name:	Butanedioic acid [(dimethoxy-phosphinothioyl)thio]-, diethyl ester
CAS No.:	121-75-5
Molecular formula:	C ₁₀ H ₁₉ O ₆ PS ₂
Molecular mass:	330.36 g/mol
Structure formula:	

Statement of GLP Compliance

The identification and determination of purity were performed at Cheminova A/S and conducted according to FIFRA Good Laboratory Practice Standards, 40 CFR Part 160 and the OECD Principles of Good Laboratory Practices.

Date

March 2, 2010



Cheminova A/S
P.O. Box 9
DK-7620 Lemvig
Denmark

Phone (+45) 96 90 96 90
Fax (+45) 96 90 96 91
www.cheminova.com
CVR-No. DK12 76 00 43

Certificate of Analysis

TEM 010-08

Test substance certified:

Test substance:	Malathion Technical fortified			
CHA Code No.:	-			
Batch No.:	D2014-OSJ-MLT-01-S			
Origin of test substance:	<input checked="" type="checkbox"/> Laboratory	<input type="checkbox"/> Pilot plant	<input type="checkbox"/> Commercial	

Analysis:

Content of Malathion:	95.8% w/w
Identified by:	¹ H-NMR and ¹³ C-NMR Spectroscopy, Mass Spectrometry and IR Spectroscopy
Quantified by:	GC (Method VAM 001-02)
Date of analysis:	September 28, 2010

Information of the test substance:

Appearance:	Pale yellowish liquid
Storage:	Refrigerator
Tap density:	Not determined
Expiry date:	September 28, 2013

Information of analyte(s):

Common name:	Malathion
CAS name:	Butanedioic acid ((dimethoxyphosphino-thioyl) thio)-, diethyl ester
CAS No.:	121-75-5
Molecular formula:	C ₁₀ H ₁₉ O ₆ PS ₂
Molecular mass:	330.36 g/mol
Structure formula:	

Statement of GLP Compliance

The identification and quantification were performed at Cheminova A/S and conducted according to FIFRA Good Laboratory Practice Standards, 40 CFR Part 160 and the OECD Principles of Good Laboratory Practices.

Date

November 9, 2010

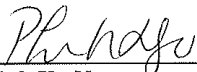
Barbara Hinz

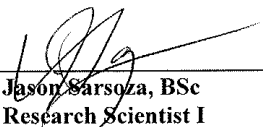
Appendix 3
Analytical Procedure

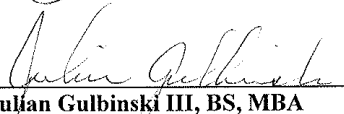


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**Analytical Procedure for the
Analysis of Malathion in Meal Form of Certified Rodent Diet® #5002
Containing 5% Corn Oil Dose Formulations by HPLC-UV**

Prepared By:  05 Dec 2011
Phinh Xu Ngo
Research Assistant III
Date

Reviewed By:  05 DEC 2011
Jason Sarsoza, BSc
Research Scientist I
Date

Authorized By:  05 Dec 2011
Julian Gulbinski III, BS, MBA
Senior Manager, Laboratory Sciences
Date

AP Number:	MALA02	Revision Number:	04
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1 Purpose

The purpose of this analytical procedure is to accurately determine the concentration of Malathion in Meal form of Certified Rodent Diet® #5002 containing 5% corn oil dose formulations. This analytical procedure is suitable for GLP sample analysis.

2 Scope

Analysis of Malathion in dose formulation samples with limitations as stated below.

Vehicle: Meal form of Certified Rodent Diet® #5002 containing 5% Corn Oil

Sample Volume (or Amount): 1 g

Volumetric Samples [] Gravimetric Samples [x] Both []

Concentrations Covered by Analytical Procedure:

NOTE: Concentrations have been corrected for purity of 99.6% (Calibration Range) and 96% (Valid Sample Range).

Final Injected Concentration

LOD	NA
Calibration Standard Range	1.5 – 27 µg/mL
Valid Sample Range	40 – 20 000 ppm

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3 Stability

Description	Concentration Range	Storage Conditions	Time Period
Process Stability (Standards)	1.5 - 27 µg/mL	15°C	39 hours
Process Stability (Spiked Samples)	2 -20 µg/mL	15°C	58 hours
Stability Period 1	40 – 20 000 ppm	20°C to 25°C	22 Days
Stability Period 2	40 – 20 000 ppm	2 to 8°C	22 Days
Standard Stability (Standards)	1.5 - 27 µg/mL	2 to 8°C	6 Days
Standard Stability (Spiked Samples)	2 – 20 µg/mL	2 to 8°C	18 Days

Note: all storage conditions are unprotected from light unless specified otherwise.

4 Definitions/Abbreviations

HPLC:	High Performance Liquid Chromatography
ND:	None detected
N/A:	Not applicable
MPA:	Mobile Phase A
MPB:	Mobile Phase B
LOD:	Limit of Detection
LLOQ:	Lower Limit of Quantitation

5 Correction Factors

Purity/Salt Factor:	Refer to Protocol (for spiked samples) and Certificate of Analysis (for calibration standards).
Density:	None – no correction

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6 Materials

6.1 Chemicals

Water, HPLC grade or equivalent
Acetonitrile (ACN), HPLC grade or equivalent

6.2 Supplies

Volumetric flasks
Volumetric pipettes
Eppendorf repeater and Combi tips
Centrifuge
Tumbler Glas Col Cat # 099A RD44512 or equivalent
50 mL polypropylene conical tubes
Polypropylene screw top bottle
20 mL glass scintillation vials
Autosampler Vial Caps Snap-It Teflon Split Septa caps or equivalent
Millipore, 0.22 μ , 13 mm diameter, GV PVDF filter

7 Procedure

7.1 Preparation of Reagents

Other volumes may be prepared using the same proportions. Store all reagents at room temperature and use within 1 month unless noted otherwise.

7.1.1 Mobile Phase A, Acetonitrile

Transfer approximately 1000 mL ACN into a suitable container.

7.1.2 Mobile Phase B, Water

Transfer approximately 1000 mL water into a suitable container. Use within 1 week of opening bottle ("Use by" date).

7.1.3 Needle Rinse, ACN:Water, 90:10, v:v

Transfer 450 mL ACN into a suitable container and add 50 mL water. Mix well.

7.1.4 Diluent or Extraction Solution, 100% Acetonitrile

Use as supplied.

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7.2 Preparation of Stocks, Working Stocks, Standards and Blanks

Different volumes may be prepared with Project Scientist approval as long as concentrations remain the same.

Stocks, working stocks, standards and blanks should be stored at $5^{\circ}\text{C} \pm 3^{\circ}\text{C}$.

7.2.1 Preparation of Stocks

	Malathion Analytical Standard (CSA-10744) weight (mg)*	Volumetric Flask (mL)	Diluent
Stock A	60.24 ± 1.2	100	Diluent
Stock B	60.24 ± 1.2	100	Diluent

* Record weights to the nearest 0.01 mg. Weights are corrected for a purity of 99.6%.

7.2.2 Preparation of Working Stocks

	Aliquot from Stock A (mL)	Aliquot from Stock B (mL)	Volumetric Flask (mL)	Diluent
Working Stock A	10	N/A	100	Diluent
Working Stock B	N/A	10	100	Diluent

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7.2.3 Preparation of Standards and Diluent Blank

Calibration Standards	Aliquot from Working Stock A (mL)	Aliquot from Working Stock B (mL)	Volumetric Flask (mL)	Diluent
A1	0.5	N/A	20	Diluent
A2	2	N/A	20	Diluent
A3	6	N/A	20	Diluent
B1	N/A	1	20	Diluent
B2	N/A	4	20	Diluent
B3	N/A	9	20	Diluent
Diluent Blank	N/A	N/A	*	Diluent

* Transfer approximately 1mL Diluent into an injection vial.

7.3 Preparation of Spiked Samples and Vehicle Blanks

Different volumes may be prepared with Project Scientist approval as long as concentrations remain the same.

Spike stocks, spiked samples and vehicle blanks should be stored at $5^{\circ}\text{C} \pm 3^{\circ}\text{C}$.

7.3.1 Preparation of Spike Stock B

	Malathion Technical (CSA-10758) weight (mg)*	Volumetric Flask (mL)	Diluent
Spike Stock B	208.3 \pm 4.0	5	Diluent

* Material with different CSA number may be used as long as the material has the same lot/batch no. used to prepare the dose formulations. Record weights to the nearest 0.01 mg; weights are corrected for a purity of 96%.

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7.3.2 Preparation of Spike Stock A

Spiked Samples	Aliquot from Spike Stock B (mL)	Volumetric Flask (mL)	Diluent
Spike Stock A	0.5	250	Diluent

7.4 Preparation of Spiked Samples and Vehicle Blanks

Prepare spiked samples and vehicle blank in duplicate at each level.

Spiked Samples	Aliquot from Spike Stock A (mL)	Aliquot from Spike Stock B (mL)	Feed (g)*	Corn Oil (mg)**	Extraction Solution Added (mL)***
Spike A	0.5	NA	1.0	50 ± 2.0	20
Spike B	NA	0.5	1.0	50 ± 2.0	20
Vehicle Blank	NA	NA	1.0	50 ± 2.0	20

* Record weights to the nearest 0.001 g.

** Record weights to the nearest 0.01 mg.

*** Use a verified repeater pipette or volumetric pipette

7.4.1 Weigh blank rodent diet directly into tared 50 mL polypropylene conical tubes.

7.4.2 For Spike A and Spike B, add Spike Stock A and Spike Stock B, respectively, to the diet and dry spiked diets for at least 75 minutes at ambient temperature, under a fume hood.

7.4.3 Add corn oil to the dried spiked diets (spiked samples) and blank diet (vehicle blanks). Mix to coat the diet with corn oil.

7.4.4 Add the required amount of extraction solution.

7.4.5 Tightly cap the tubes, tumble in a rotary tumbler for at least 75 minutes at a speed set at 50%.

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7.4.6 Centrifuge for 10 minutes at a speed set at 2500 rpm.

7.4.7 Filter extracts into individual 20 mL glass scintillation vials, discarding the first 1 mL of filtrate to waste.

7.4.8 Dilute Spike B extracts as indicated in the dilution table below. Mix well and transfer an aliquot of each final dilution into individual autosampler vials.

Spiked Sample	Aliquot of Spike B (mL)	Volumetric Flask (mL)	Diluent
Spike B	0.5	25	Diluent

7.4.9 Transfer aliquots of each spike A and vehicle blank filtrate into individual autosampler vials.

7.5 Sample Preparation

Dilution schemes other than those listed in the tables below may be utilized with Project Scientist approval. The sample concentrations for all dilutions must be within the validated range of the method.

If samples are provided in single, extract each sample in duplicate. If samples are provided in duplicate, extract each sample in single.

Diluted samples should be stored at $5^{\circ}\text{C} \pm 3^{\circ}\text{C}$.

7.5.1 Weigh 1.0 g of sample directly into a tarred 50 mL polypropylene conical tube using a balance capable of reading at least 0.001 g.

7.5.2 Using a verified repeater pipette or volumetric pipette, add 20 mL Extraction Solution.

7.5.3 Tightly cap the tubes, tumble in a rotary tumbler for at least 75 minutes at a speed set at 50%.

7.5.4 Centrifuge for 10 minutes at a speed set at 2500 rpm.

7.5.5 Filter extracts into individual 20 mL glass scintillation vials, discarding the first 1 mL of filtrate to waste.

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7.5.6 The initial sample extracts may be diluted further as indicated in the Dilution table below. Mix well and transfer an aliquot of each final dilution into individual auto sampler vials.

Extraction		
Sample Concentration Range (ppm)	Sample Size (g)*	Extraction Solution Added (mL)**
0 and from 40 to 20 000	1.0	20

* Record weights to the nearest 0.001 g.

** Use a verified repeater pipette or volumetric pipette

Dilution			
Sample Concentration Ranges (ppm)	Aliquot from Extract (mL)	Final Dilution Volumetric Flask Size (mL)	Diluent
0 and from 40 to 359	N/A	N/A	N/A
From 360 to 599	5	10	Diluent
From 600 to 3599	1	10	Diluent
From 3600 to 8999	1	25	Diluent
From 9000 to 20 000	0.5	25	Diluent

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7.6 Analytical Run Sequence and Composition

7.6.1 The typical run list should follow this order

≥ 3 system checks	test injections
5 replicate injections	system suitability (B3 standard)
1 injection each	six point calibration curve
1 injection	diluent blank
1 injection each	vehicle blank and spiked samples
1 injection	check standard (A3)
≤ 10 injections	unknown samples
1 injection	check standard (A3)

7.6.2 Repeat last two lines as necessary if more than 10 samples are analyzed. A single replicate of the check standard is analyzed after the last unknown sample in the entire analysis batch.

7.7 Analytical Conditions

Use the HPLC system described below, adjusting the solvent ratio if necessary, to approximate the retention time listed below. Refer to the SOP for Chromatographic System Suitability.

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7.7.1 Instrumental

Pump: PerkinElmer Series 200 or equivalent
 Autosampler: PerkinElmer Series 200 or equivalent
 Detector: PerkinElmer Series 200 or equivalent
 Column Heater: PerkinElmer, Peltier Column Oven Series 200 or equivalent
 Peltier Tray: PerkinElmer Series 200 or equivalent
 Degasser: PerkinElmer Series 200 or equivalent
 Analytical Column: Phenomenex, Luna C18(2), 250 x 4.6 mm, 5µm
 Column Temperature: 30°C
 Autosampler Temp: 15°C
 Detection: Ultraviolet @ 210nm
 Sampling rate: 2 points/second
 Injection Volume: 25 µL
 Mobile Phase A: 100% Acetonitrile
 Mobile Phase B: 100% Water
 Needle Rinse: Acetonitrile:Water, 90:10, v:v
 Flow Rate: 1.4 mL/min
 Run Time: 60 minutes
 Typical Retention Time for Malathion*: 26.8 ± 1.3 minutes

Run Type:

Gradient

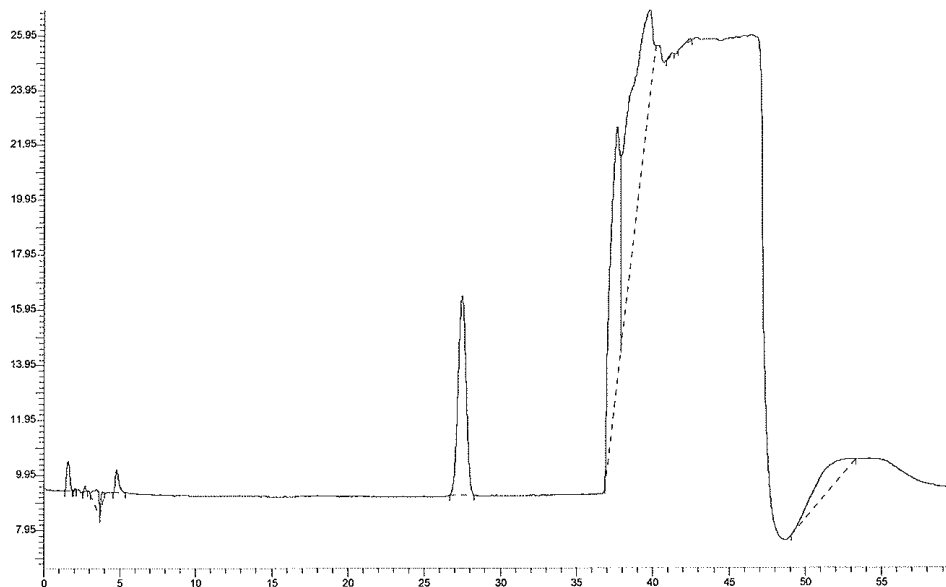
<u>Time (min)</u>	<u>MPA%</u>	<u>MPB%</u>	<u>Curve**</u>
0.5	45	55	0
34.0	45	55	0
0.1	90	10	1
10.0	90	10	0
0.1	45	55	1
15.8	45	55	0

* Retention times outside of this window may be accepted with Project Scientist approval as long as there are no significant peaks interfering with the Malathion.

** Gradient (1 denotes a linear Curve).

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7.7.2 Example Chromatogram for B3 Standard



7.8 Calculations

- 7.8.1 Chromatograms will be automatically integrated and visually inspected for an acceptable integration.
- 7.8.2 Calculate the relative standard deviation (%) of the peak areas, the relative standard deviation (%) of the retention time and the mean tailing factor for five system suitability injections.
- 7.8.3 Calculate the reference standard concentration of the calibration standards, in terms of microgram of Malathion per milliliter.
- 7.8.4 Compute the unweighted linear regression relating the peak areas of the standards to their respective Malathion concentrations, without blank correction.
- 7.8.5 Compute the correlation coefficient for the standard curve.

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- 7.8.6 Using the peak area of the spiked samples and samples, and the regression equation, determine the concentration in ppm of Malathion. Correct for the dilution factor if necessary.
- 7.8.7 Concentrations found to be less than the lowest calibration standard will be reported as <LLOQ. In cases, such as blank samples, where no peak is observed, the results will be reported as none detected (ND).
- 7.8.8 Calculate mean concentrations for replicate samples. Calculate the percent error from theoretical as: (mean concentration found – theoretical concentration) / theoretical concentration x 100.

7.9 Acceptance Criteria

7.9.1 System Suitability

The Malathion peaks in the five system suitability injections must meet the following acceptable limits: The mean tailing factor ≤ 2 , the relative standard deviation (%) of the peak areas $\leq 2\%$, and the relative standard deviation (%) of the retention time $\leq 2\%$. If the criteria are out of the acceptable limits, make corrections to the HPLC system and repeat the suitability injections.

7.9.2 Correlation Coefficient

The correlation coefficient for the standard curve must not be less than 0.995. If the value is not greater than or equal to 0.995, repeat the preparation of the standard curve.

7.9.3 Calibration Standards

The back-calculated concentrations for calibration standards must be within $\pm 5\%$ of their nominal theoretical concentrations. Standards not meeting criteria can be dropped as long as no more than 20% of standards are dropped. The LLOQ or ULOQ will be redefined to the remaining lowest or highest standards if necessary.

7.9.4 Check Standards

The back-calculated concentration for the A3 check standards must be within 5% of nominal theoretical concentration.

7.9.5 Spiked Samples

The back-calculated concentrations for the spiked samples must be within $\pm 15\%$ of their nominal theoretical concentration.

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7.9.6 Replication of Results

Replicate concentrations found for diet formulations must not vary by more than 15%. Acceptance is defined as: (low value / high value) \geq 0.85. Results that do not meet this criterion will be reviewed by the Project Scientist. Reason for acceptance will be documented in the raw data.

8 Revision History

- 8.1 Initial Analytical Procedure: Method validation performed at Charles River Laboratories Preclinical Services, Pennsylvania under project TQC00067DX.
- 8.2 Revision 00 to 01:
 - 8.2.1 Section 3: Added Stability Period 1 and 2, and Standard Stability data.
 - 8.2.2 Preparation of Spiked Samples and Vehicle Blanks form: Added space to document corn oil details.
- 8.3 Revision 01 to 02:
 - 8.3.1 Section 3: Changed the storage condition.
- 8.4 Revision 02 to 03:
 - 8.4.1 Section 8.3: Corrected typographical error.
- 8.5 Revision 03 to 04:
 - 8.5.1 Section 2: Correct vehicle identification.
 - 8.5.2 Section 7.7.2: Updated chromatogram.

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APPENDIX I BATCH AND REAGENT PAPERWORK

'Preparation of Reagents', 'Calibration Standard Preparation', 'Preparation of Spike Stocks', 'Preparation of Spiked Samples and Vehicle Blanks', 'Preparation of Samples' and 'Instrument Parameters' sheets in the AP appendix will be copied from the current signed AP revision, filled out recording raw data, and placed into batch folders to be stored with the study materials.

Paperwork not included in the AP appendix may also be utilized if reviewed, approved, and initialed/dated by a Project Scientist or management, and documented/filled-out properly.

Approval for batch paperwork not included in the AP should occur the day of and/or prior to the batch if possible, but this may not always be possible, in which case posterior approval will be acceptable.

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Preparation of Reagents Prepared by: _____ Date: _____

Batch ID: _____

NA ☐ Mobile Phase A (Acetonitrile) ID: _____-_____-_____-MPA

Transfer approximately _____ mL ACN into a suitable container.

Storage Temperature: Room Temperature (22±5°C)

Expiration Date: _____

NA ☐ Mobile Phase B (Water) ID: _____-_____-_____-MPB

Transfer approximately _____ mL water into a suitable container.

Storage Temperature: Room Temperature (22±5°C)

Expiration Date: _____

NA ☐ Needle Rinse (Acetonitrile:Water, 90:10, v:v)

ID: _____-_____-_____-NR

Transfer _____ mL ACN into a suitable container and add _____ mL water. Mix well.


Storage Temperature: Room Temperature (22±5°C)

Expiration Date: _____

Materials Used:

Water: Vendor: _____ Grade: _____ Use by: _____ Lot #: _____ Exp: _____

Acetonitrile: Vendor: _____ Grade: _____ Strength / Purity: _____ Lot #: _____ Exp: _____

Approved by:  Date: 05 DEC 2011

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Calibration Standard Preparation

Batch ID:

Analyst Initials: _____ Date: _____					
Stock Solutions					
Compound Name		Weight (mg)	Final Vol. (mL)	ID	
	Stock A			Project Number-Notebook Number-Batch Number-	-STKA
	Stock B				-STKB
Balance ID: _____ Standard Used: CSA- _____					
Diluting Solution ID: _____ Supplier: _____ Lot: _____ Expiry Date: _____					
Working Stock Solutions					
	mL of STKA	mL of STKB	Final Vol. (mL)	ID	
Working Stock A				Project Number-Notebook Number-Batch Number-	-WSTKA
Working Stock B					-WSTKB
Pipette ID: _____					
Diluting Solution ID: _____ Supplier: _____ Lot: _____ Expiry Date: _____					
Calibration Standards					
Standard	mL of WSTKA	mL of WSTKB	Final Vol. (mL)	ID	
A1					-A1
B1					-B1
A2				Project Number-Notebook Number-Batch Number-	-A2
B2					-B2
A3					-A3
B3					-B3
Diluent Blank			<input type="checkbox"/> ¹		-DBlk
Pipette ID: _____					
Diluting Solution ID: _____ Supplier: _____ Lot: _____ Expiry Date: _____					
¹ Transfer ~ 1 mL of Diluent into an injection vial Dilutions stored in unit _____					

Approved by:  Date: 05 DEC 2011

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Preparation of Spiked Stocks

Batch ID:


Analyst Initials:		Date:		
Spike Stock B Solution				
Compound Name		Weight (mg)	Final Vol. (mL)	ID
	Spike Stock B			Project Number-Notebook Number-Batch Number- -SPK STKB
Balance ID: _____ Standard Used: CSA- _____				
Diluting Solution ID: _____ Supplier: _____ Lot: _____ Expiry Date: _____				
Spike Stock A Solution				
	mL of SPK STK B	Final Vol. (mL)	ID	
Spike Stock A			Project Number-Notebook Number-Batch Number- -SPK STKA	
Pipette ID: _____				
Diluting Solution ID: _____ Supplier: _____ Lot: _____ Expiry Date: _____				
Dilutions stored in unit _____				

Approved by: *LJA* Date: 05DEC2011

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Preparation of Spiked Samples and Vehicle BlanksBatch ID:

Analyst Initials: _____ Date: _____									
Spiked Samples and Vehicle Blanks									
	Extraction					Dilution		ID	
	mL of SPK STK A ^A	mL of SPK STK B ^A	Feed (g) ^c	Corn Oil (mg) ^D	Extraction Solution Added (mL) ^B	mL of Super-natant ^A	Final Vol. (mL)		
A1								Project Number-Notebook Number-Batch Number- _____	-SPK A1
A2									-SPK A2
B1									-SPK B1
B2									-SPK B2
VBLK a									-VBLK a
VBLK b									-VBLK b
Pipette ID: ^A _____ ^B _____ Balance ID: ^C _____ <input type="checkbox"/> (weigh into 50 mL polypropylene tubes) Feed: Meal Form Certified Rodent Diet ® #5002 ID: _____ Supplier: _____ Lot: _____ Exp: _____ Diluting Solution ID: _____ Supplier: _____ Lot: _____ Expiry Date: _____ <u>Extraction Procedure</u> 1. Allow spiked feed to dry at ambient temperature, under a fume hood. Start Time: _____ End Time: _____ 2. Add corn oil to diet and mix <input type="checkbox"/> ; Corn Oil: Supplier: _____ Lot #: _____ Expiration Date: _____ 3. After adding extraction solution, tightly cap tubes and mix on a rotary tumbler Start Time: _____ End Time: _____ Speed: _____ Tumbler ID: _____ 4. Centrifuge tubes: _____ rpm _____ minutes. Centrifuge ID: _____ 5. Filter extracts, discard first 1 mL to waste Filter – Supplier: _____ Type: _____ Pore Size: _____ Diameter: _____ Lot: _____ Storage unit _____									

Approved by:  Date: 05 DEC 2011

AP Number:	MALA02	Revision Number:	04
Effective Date:	06 December 2011	Page	20 Of 21

Instrument Parameters

Batch ID:				
Analyst Initials:		Date:		
Data System:		TotalChrom 6.2.1		
PALC#:				
Column:	Brand			
	Type			
	Size (LxW, particle size)			
	S/N			
Pressure:		psi		
Sampling Rate:		pts/sec		
Column Temperature:		deg C		
Autosampler Temperature:		deg C		
Wavelength:		nm		
Injection Volume:		µL		
Run Time:		min		
Flow Rate:		mL/min		
Sequence:				
Mobile Phase A:				
Mobile Phase B:				
Needle Rinse:				
Run Type:		Gradient Program		
	Time (min)	%MPA	%MPB	Curve

Approved by:  Date: 05 DEC 2011

AP Number:	MALA02	Revision Number:	04
Effective Date:	06 December 2011	Page	21 Of 21

Sample Preparation

Batch ID:
Analyst Initials: _____ Date: _____

Samples Received: _____
General ID: _____

Group No.	Sample ID	Conc. (ppm)	Sample Weights(g) ^A	Vol. of Extraction Solution Added (mL) ^B	mL of Extract ^C	Vol. of Dilution (mL)	Prep Date(s): _____
							Final Dilution ID
							Project Number-Notebook Number-Batch Number- _____

Balance ID: ^A ☐ (weigh into 50 mL polypropylene tubes) Pipette ID: ^B _____ °C

Diluting Solution ID: _____ Supplier: _____ Lot: _____ Expiry Date: _____

1. Tightly cap the tubes and mix on a rotary tumbler Start Time: _____ End Time: _____ Speed: _____ % Tumbler ID: _____

2. Centrifuge tubes at _____ rpm for _____ minutes. Centrifuge ID: _____

3 Filter extracts, discard first 1 mL to waste; Filter – Supplier: _____ Type: _____ Pore Size: _____

Diameter: _____ Lot: _____ Storage Unit: _____

Appendix 4
Dose Formulation Analysis Reports

DOSE FORMULATION ANALYSIS REPORT

Sponsor: Cheminova A/S

Study Facility: Charles River Laboratories Preclinical Services, Pennsylvania

Protocol Number: TQC00066AA

Analyte: Malathion Technical

Analytical Facility: Charles River Laboratories Preclinical Services, Pennsylvania

Batch ID: TQC00066AA-1-001-1

Sampling Criteria: Start of Study Concentration and Homogeneity Analysis (Week 1)

Vehicle: The Meal Form of Certified Rodent Diet#5002

Storage Conditions: 2°C to 8°C, protected from light

Analytical Procedure: MALA02 Revision 01

Analysis Date: January 13, 2011

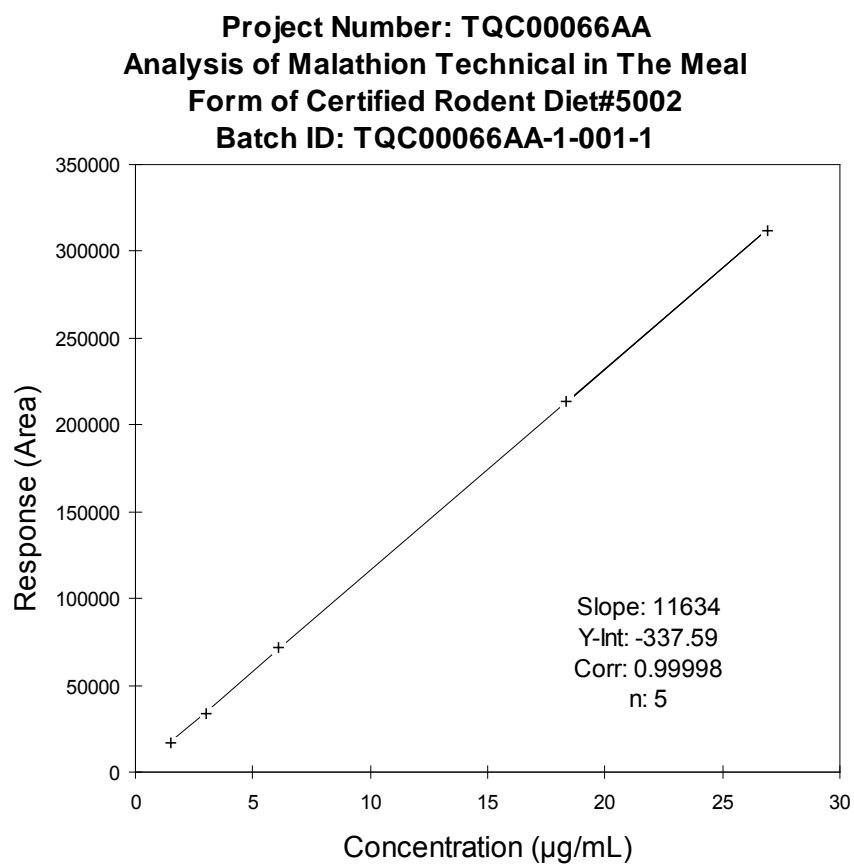
Notes: Standards were corrected for a purity of 99.6%.

RESULTS: (Concentrations in µg/mL (standards), ppm (Samples) ND = none detected)CALIBRATION STANDARDS

Standard Description	Nominal Conc.	Response Area	Calculated Conc.	% Bias	"X" = Exclude	Criteria Limit	Standard Pass/Fail
Cal Std A1	1.527	16807	1.474	-3.5		5%	PASS
Cal Std B1	2.988	33992	2.951	-1.2		5%	PASS
Cal Std A2	6.108	71601	6.183	+1.2		5%	PASS
Cal Std B2	11.95	141038	12.15	+1.7	X	5%	PASS
Cal Std A3	18.33	213807	18.41	+0.4		5%	PASS
Cal Std B3	26.89	311756	26.83	-0.2		5%	PASS

CHECK STANDARDS

Standard Description	Nominal Conc.	Response Area	Dilution Factor	Conc. Found	% Bias	Criteria Limit	Standard Pass/Fail
Check Std A3	18.33	214588	1	18.47	+0.8	5%	PASS
Check Std A3	18.33	215866	1	18.58	+1.4	5%	PASS
Check Std A3	18.33	212731	1	18.31	-0.1	5%	PASS
Check Std A3	18.33	216969	1	18.68	+1.9	5%	PASS
Check Std A3	18.33	216073	1	18.60	+1.5	5%	PASS
Check Std A3	18.33	215146	1	18.52	+1.0	5%	PASS
Check Std A3	18.33	215659	1	18.57	+1.3	5%	PASS



SAMPLES

<u>Sample Description</u>	<u>Prep Date</u>	<u>Nominal Sample Conc.</u>	<u>Replicate</u>	<u>Response Area</u>	<u>Total Dilution Factor</u>	<u>Density Corrected ppm</u>	<u>Mean ppm Found</u>	<u>% Bias</u>
Group I Top	01/12/11	0	A	0	20.02	ND		
			B	0	19.98	ND		
Group I Middle	01/12/11	0	A	0	20.04	ND		
			B	0	20.06	ND		
Group I Bottom	01/12/11	0	A	0	19.88	ND		
			B	0	19.86	ND		
Group II Top	01/12/11	100	A	55366	19.90	95.28	97.18	-2.8
			B	57702	19.86	99.08		
Group II Middle	01/12/11	100	A	54900	20.02	95.05	95.85	-4.2
			B	55939	19.98	96.65		
Group II Bottom	01/12/11	100	A	57169	19.90	98.37	95.95	-4.1
			B	54123	19.98	93.53		
Group III Top	01/12/11	500	A	152955	39.84	525.0	527.9	+5.6
			B	154939	39.76	530.7		
Group III Middle	01/12/11	500	A	150907	39.72	516.4	503.8	+0.8
			B	143356	39.76	491.1		
Group III Bottom	01/12/11	500	A	144847	39.72	495.7	495.7	-0.9
			B	143225	40.16	495.6		
Group IV Top	01/12/11	5000	A	130434	500.0	5620	5433	+8.7
			B	121730	500.0	5246		
Group IV Middle	01/12/11	5000	A	117080	500.0	5046	5070	+1.4
			B	118671	498.0	5094		
Group IV Bottom	01/12/11	5000	A	117982	498.5	5070	5045	+0.9
			B	116242	501.0	5020		
Group V Top	01/12/11	10000	A	116999	1003	10120	10490	+4.9
			B	126830	993.0	10860		
Group V Middle	01/12/11	10000	A	113984	1000	9827	10010	+0.1
			B	117678	1004	10190		
Group V Bottom	01/12/11	10000	A	119398	1001	10300	10200	+2.0
			B	116992	1000	10090		

HOMOGENEITY

Sample	Nominal	Grand		
<u>Description</u>	<u>Sample</u>	<u>Mean</u>	<u>%</u>	<u>%</u>
	<u>Conc.</u>	<u>Conc.</u>	<u>RSD</u>	<u>Error</u>
Group II	100	96.27	0.7	-3.7
Group III	500	509.1	3.3	1.8
Group IV	5000	5183	4.2	3.7
Group V	10000	10230	2.4	2.3

CONCLUSIONS: Results indicate that the formulations are within the acceptable limits of $\pm 10\%$ of nominal concentrations. The formulations are also within the acceptable limits of $\leq 5\%$ RSD for homogeneity.

ACTIONS TAKEN: None.

DOSE FORMULATION ANALYSIS REPORT

Sponsor: Cheminova A/S

Study Facility: Charles River Laboratories Preclinical Services, Pennsylvania

Protocol Number: TQC00066

Analyte: Malathion Technical

Analytical Facility: Charles River Laboratories Preclinical Services, Pennsylvania

Batch ID: TQC00066AA-1-002-1

Sampling Criteria: Second Preparation Concentration Analysis (Week 3)

Vehicle: The Meal Form of Certified Rodent Diet #5002

Storage Conditions: 2°C to 8°C, protected from light

Analytical Procedure: MALA02 Revision 01

Analysis Date: January 27, 2011

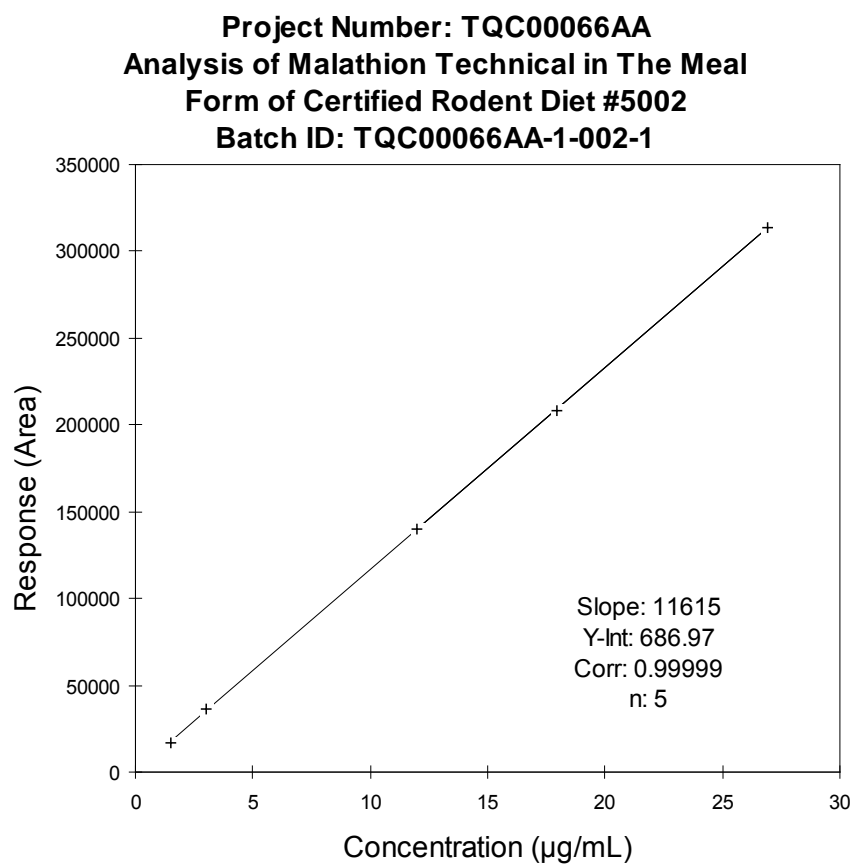
Notes: Standards were corrected for a purity of 99.6%.

RESULTS: (Concentrations in µg/mL, ppm (Samples) ND = none detected)CALIBRATION STANDARDS

Standard Description	Nominal Conc.	Response Area	Calculated Conc.	% Bias	"X" = Exclude	Criteria Limit	Standard Pass/Fail
Cal Std A1	1.494	17187	1.421	-4.9		5%	PASS
Cal Std B1	2.992	36107	3.050	+1.9		5%	PASS
Cal Std A2	5.974	71150	6.067	+1.6	X	5%	PASS
Cal Std B2	11.97	140352	12.02	+0.4		5%	PASS
Cal Std A3	17.92	208421	17.88	-0.2		5%	PASS
Cal Std B3	26.93	313452	26.93	0.0		5%	PASS

CHECK STANDARDS

Standard Description	Nominal Conc.	Response Area	Dilution Factor	Conc. Found	% Bias	Criteria Limit	Standard Pass/Fail
Check Std A3	17.92	207943	1	17.84	-0.4	5 %	PASS
Check Std A3	17.92	210000	1	18.02	+0.6	5 %	PASS



SAMPLES

<u>Sample Description</u>	<u>Prep Date</u>	<u>Nominal Sample Conc.</u>	<u>Replicate</u>	<u>Response Area</u>	<u>Total Dilution Factor</u>	<u>Density Corrected ppm</u>	<u>Mean ppm Found</u>	<u>% Bias</u>
Group I	01/26/11	0	A	0	19.80	ND		
			B	0	19.69	ND		
Group II	01/26/11	100	A	59636	19.70	100.0	99.79	-0.2
			B	59101	19.80	99.58		
Group III	01/26/11	500	A	143534	39.45	485.2	487.5	-2.5
			B	144439	39.56	489.7		
Group IV	01/26/11	5000	A	121923	491.6	5132	5059	+1.2
			B	116753	499.0	4986		
Group V	01/26/11	10000	A	118610	978.5	9934	9967	-0.3
			B	120478	969.9	10000		

CONCLUSIONS: Results indicate that the formulations are within the acceptable limits of $\pm 10\%$ of nominal concentrations.

ACTIONS TAKEN: None

DOSE FORMULATION ANALYSIS REPORT

Sponsor: Cheminova A/S

Study Facility: Charles River Laboratories Preclinical Services, Pennsylvania

Protocol Number: TQC00066

Analyte: Malathion Technical

Analytical Facility: Charles River Laboratories Preclinical Services, Pennsylvania

Batch ID: TQC00066AA-1-003-1

Sampling Criteria: Third Preparation Concentration Analysis (Week 5)

Vehicle: Meal Form of Certified Rodent Diet # 5002

Storage Conditions: 2°C to 8°C, protected from light

Analytical Procedure: MALA02 Revision 01

Analysis Date: February 11, 2011

Notes: Standards were corrected for a purity of 99.6%.

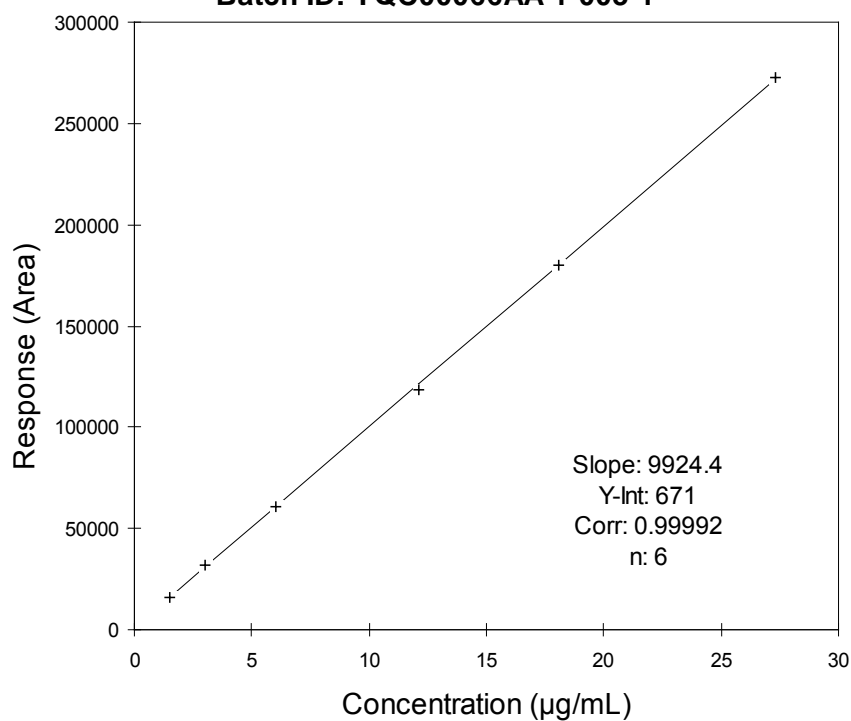
RESULTS: (Concentrations in µg/mL (standards), ppm (Samples) ND = none detected)CALIBRATION STANDARDS

Standard Description	Nominal Conc.	Response Area	Calculated Conc.	% Bias	"X" = Exclude	Criteria Limit	Standard Pass/Fail
Cal Std A1	1.505	15793	1.524	+1.3		5%	PASS
Cal Std B1	3.036	31902	3.147	+3.7		5%	PASS
Cal Std A2	6.020	60572	6.036	+0.3		5%	PASS
Cal Std B2	12.15	118771	11.90	-2.1		5%	PASS
Cal Std A3	18.06	180209	18.09	+0.2		5%	PASS
Cal Std B3	27.33	272641	27.40	+0.3		5%	PASS

CHECK STANDARDS

Standard Description	Nominal Conc.	Response Area	Dilution Factor	Conc. Found	% Bias	Criteria Limit	Standard Pass/Fail
Check Std A3	18.06	182325	1	18.30	+1.3	5%	PASS
Check Std A3	18.06	179470	1	18.02	-0.2	5%	PASS
Check Std A3	18.06	182438	1	18.32	+1.4	5%	PASS

Project Number: TQC00066AA
Analysis of Malathion in Meal Form of Certified
Rodent Diet # 5002
Batch ID: TQC00066AA-1-003-1



SAMPLES

<u>Sample Description</u>	<u>Prep Date</u>	<u>Nominal Sample Conc.</u>	<u>Replicate</u>	<u>Response Area</u>	<u>Total Dilution Factor</u>	<u>Density Corrected ppm</u>	<u>Mean ppm Found</u>	<u>% Bias</u>
Group I	02/10/11	0	A	0	19.92	ND		
			B	0	20.00	ND		
Group II	02/10/11	100	A	51595	19.92	102.2	102.9	+2.9
			B	52204	19.96	103.6		
Group III	02/10/11	500	A	125187	39.45	494.9	495.1	-1.0
			B	124400	39.72	495.2		
Group IV	02/10/11	5000	A	103203	494.6	5110	5034	+0.7
			B	100756	491.6	4958		
Group V	02/10/11	10000	A	101154	995.0	10080	10200	+2.0
			B	104584	984.3	10310		

CONCLUSIONS: Results indicate that the formulations are within the acceptable limits of $\pm 10\%$ of nominal concentrations.

ACTIONS TAKEN: None

DOSE FORMULATION ANALYSIS REPORT

Sponsor: Cheminova A/S

Study Facility: Charles River Laboratories Preclinical Services, Pennsylvania

Protocol Number: TQC00066

Analyte: Malathion Technical

Analytical Facility: Charles River Laboratories Preclinical Services, Pennsylvania

Batch ID: TQC00066AA-1-005-1

Sampling Criteria: Fifth Preparation Concentration Analysis (Week 9)

Vehicle: Meal Form of Certified Rodent Diet #5002

Storage Conditions: 2°C to 8°C, protected from light

Analytical Procedure: MALA02 Revision 03

Analysis Date: March 29, 2011

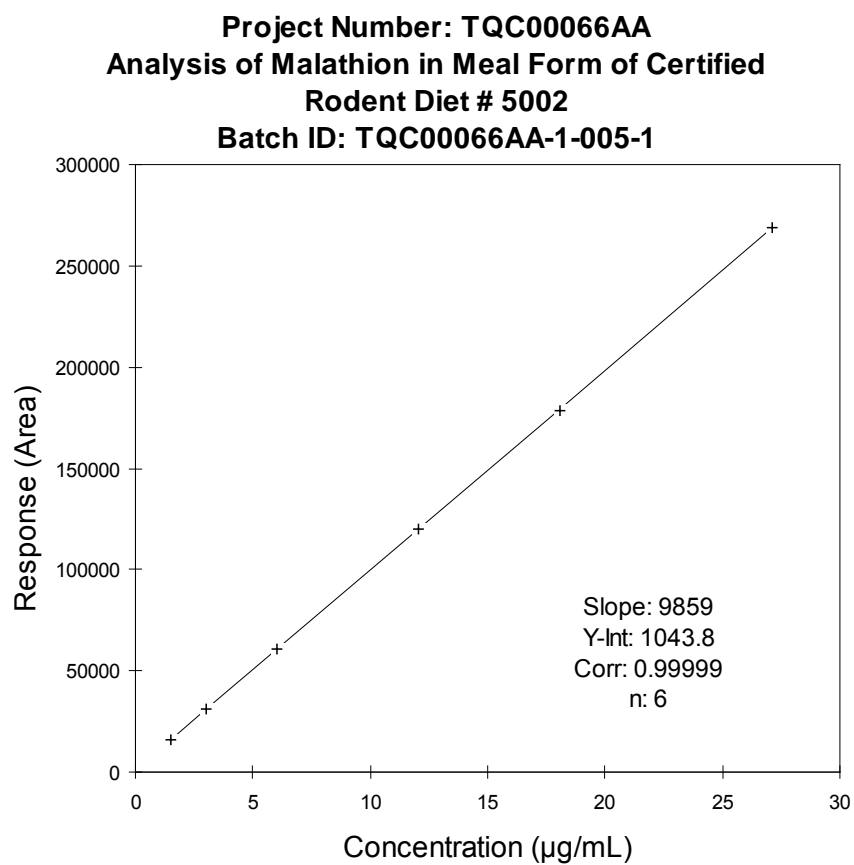
Notes: Standards were corrected for a purity of 99.6%.

RESULTS: (Concentrations in µg/mL (standards), ppm (Samples) ND = none detected)CALIBRATION STANDARDS

Standard Description	Nominal Conc.	Response Area	Calculated Conc.	% Bias	"X" = Exclude	Criteria Limit	Standard Pass/Fail
Cal Std A1	1.505	15983	1.515	+0.7		5%	PASS
Cal Std B1	3.016	30868	3.025	+0.3		5%	PASS
Cal Std A2	6.020	60661	6.047	+0.4		5%	PASS
Cal Std B2	12.06	119806	12.05	-0.1		5%	PASS
Cal Std A3	18.06	178180	17.97	-0.5		5%	PASS
Cal Std B3	27.14	269212	27.20	+0.2		5%	PASS

CHECK STANDARDS

Standard Description	Nominal Conc.	Response Area	Dilution Factor	Conc. Found	% Bias	Criteria Limit	Standard Pass/Fail
Check Std A3	18.06	180963	1	18.25	+1.1	5%	PASS
Check Std A3	18.06	181224	1	18.28	+1.2	5%	PASS



SAMPLES

<u>Sample Description</u>	<u>Prep Date</u>	<u>Nominal Sample Conc.</u>	<u>Replicate</u>	<u>Response Area</u>	<u>Total Dilution Factor</u>	<u>Density Corrected ppm</u>	<u>Mean ppm Found</u>	<u>% Bias</u>
Group I	03/10/11	0	A	0	19.90	ND		
			B	0	20.00	ND		
Group II	03/10/11	100	A	48128	20.12	96.09	95.65	-4.4
			B	47791	20.08	95.21		
Group III	03/10/11	500	A	118785	39.88	476.3	484.7	-3.1
			B	122585	40.00	493.1		
Group IV	03/10/11	5000	A	96786	502.5	4880	4854	-2.9
			B	96230	500.0	4827		
Group V	03/10/11	10000	A	96005	999.0	9622	9475	-5.3
			B	92909	1001	9327		

CONCLUSIONS: Results indicate that the formulations are within the acceptable limits of $\pm 10\%$ of nominal concentrations.

ACTIONS TAKEN: None

DOSE FORMULATION ANALYSIS REPORT

Sponsor: Cheminova A/S

Study Facility: Charles River Laboratories Preclinical Services, Pennsylvania

Protocol Number: TQC00066

Analyte: Malathion Technical

Analytical Facility: Charles River Laboratories Preclinical Services, Pennsylvania

Batch ID: TQC00066AA-1-006-1

Sampling Criteria: End of Study for Concentration Analysis (Week 13)

Vehicle: Meal Form of Certified Rodent Diet #5002

Storage Conditions: 2°C to 8°C

Analytical Procedure: MALA02 Revision 03

Analysis Date: April 11, 2011

Notes: Standards were corrected for a purity of 99.6%.

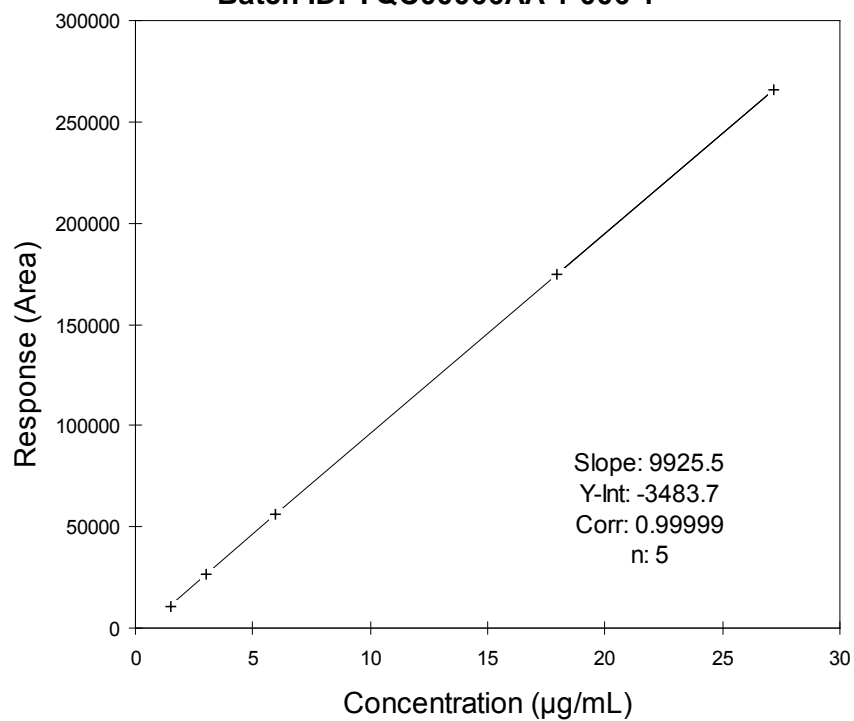
RESULTS: (Concentrations in µg/mL, ppm = samples, ND = none detected)CALIBRATION STANDARDS

Standard Description	Nominal Conc.	Response Area	Calculated Conc.	% Bias	"X" = Exclude	Criteria Limit	Standard Pass/Fail
Cal Std A1	1.494	10872	1.446	-3.2		5%	PASS
Cal Std B1	3.019	26482	3.019	0.0		5%	PASS
Cal Std A2	5.976	56313	6.025	+0.8		5%	PASS
Cal Std B2	12.08	69205	7.323	-39.4	X	5%	FAIL
Cal Std A3	17.93	174688	17.95	+0.1		5%	PASS
Cal Std B3	27.17	265975	27.15	-0.1		5%	PASS

CHECK STANDARDS

Standard Description	Nominal Conc.	Response Area	Dilution Factor	Conc. Found	% Bias	Criteria Limit	Standard Pass/Fail
Check Std A3	17.93	174143	1	17.90	-0.2	5%	PASS
Check Std A3	17.93	175210	1	18.00	+0.4	5%	PASS

Project Number: TQC00066AA
Analysis of Malathion in Meal Form of Certified
Rodent Diet #5002
Batch ID: TQC00066AA-1-006-1



SAMPLES

<u>Sample Description</u>	<u>Prep Date</u>	<u>Nominal Sample Conc.</u>	<u>Replicate</u>	<u>Response Area</u>	<u>Total Dilution Factor</u>	<u>Density Corrected ppm</u>	<u>Mean ppm Found</u>	<u>% Bias</u>
Group I	04/08/11	0	A	0	19.98	ND		
			B	0	19.94	ND		
Group II	04/08/11	100	A	44391	19.98	96.37	98.24	-1.8
			B	46453	19.90	100.1		
Group III	04/08/11	500	A	115767	40.12	482.0	479.5	-4.1
			B	114622	40.08	476.9		
Group IV	04/08/11	5000	A	92781	501.0	4859	4948	-1.0
			B	97191	496.5	5036		
Group V	04/08/11	10000	A	93938	1001	9825	9988	-0.1
			B	98015	992.1	10150		

CONCLUSIONS: Results indicate that the formulations are within the acceptable limits of $\pm 10\%$ of nominal concentrations.

ACTIONS TAKEN: None

APPENDIX 7 - CLINICAL PATHOLOGY REPORT



FINAL CLINICAL PATHOLOGY DATA SUMMARY REPORT

Study Phase: Clinical Pathology

Testing Facility Study No. TQC00066

Oral (Diet) Repeated Dose 90-Day Toxicity Study of Malathion Technical in Rats

SPONSOR:

Cheminova A/S
P.O. Box 9
DK-7620 Lemvig
DENMARK

AUTHOR:

Rebecca M. Lucke, BS, MT (ASCP)

TESTING FACILITY:

Charles River Laboratories
Preclinical Services
905 Sheehy Drive, Building A
Horsham, PA 19044
United States

TEST SITE:

Charles River Laboratories
Preclinical Services, Ohio (PCS-OH)
640 North Elizabeth Street
Spencerville, OH 45887
United States

20 December 2011

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Final Report

Page 2
Testing Facility Study No. TQC00066**1. COMPLIANCE STATEMENT**

The clinical pathology portion of this study was performed in compliance with the following Good Laboratory Practice (GLP) regulations:

- United States Code of Federal Regulations, Title 21, Part 58: Good laboratory practice for nonclinical laboratory studies.
- The Organisation for Economic Co-operation and Development (OECD) Principles on Good Laboratory Practice (C[97]186/Final).
- United States Environmental Protection Agency Code of Federal Regulations, Title 40, Parts 160 and 792: Good Laboratory Practice Standards

The clinical pathology portion of this study was conducted in accordance with the procedures described herein. The report represents an accurate and complete record of the results obtained.

There were no deviations from the above regulations that affected the overall integrity of the study or the interpretation of the study results and conclusions.



Date:

20 DEC 2011

Rebecca M. Lucke, BS, MT (ASCP)
Principal Investigator

2. QUALITY ASSURANCE STATEMENT

This study has been inspected by the Quality Assurance Unit to assure conformance with the Good Laboratory Practice (GLP) regulations promulgated by the OECD (C[97]186/Final) and EPA (CFR 40 Parts 160 and 792). Reports were submitted in accordance with Standard Operating Procedures as follows:

QA INSPECTION DATES

Dates of Inspection	Phase(s) Inspected	Date Findings Submitted to:			
		Principal Investigator	Principal Investigator Management	Study Director	Study Director Management
26-Apr-2011	Clinical Chemistry	31-May-2011	31-May-2011	20-Dec-2011	20-Dec-2011
26-Apr-2011, 27-Apr-2011, 26-May-2011	Data Audit	31-May-2011	31-May-2011	20-Dec-2011	20-Dec-2011
26-May-2011, 31-May-2011	Draft Report Review	31-May-2011	31-May-2011	20-Dec-2011	20-Dec-2011
16-Dec-2011	Final Report Review	16-Dec-2011	16-Dec-2011	20-Dec-2011	20-Dec-2011

The final clinical pathology report has been reviewed to assure that it accurately describes the materials and methods, and that the reported results accurately reflect the raw data.

Lindsay D. Langhals Date: 20 Dec 2011
Lindsay D. Langhals, BS
Quality Assurance Auditor I

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5. TEST SITE RESPONSIBLE PERSONNEL

Principal Investigator-Clinical Pathology	Rebecca M. Lucke, BS, MT (ASCP)
Site Director	Rusty E. Rush, MS, DABT
Director of Research	Mark A. Morse, PhD, DABT
Division Director, Pathology	William H. Baker, MS, DVM, DACVP
Senior Manager, Regulatory Compliance	Deanna M. Talerico, RQAP-GLP
Manager, Report Coordination	Cheryl A. Bellamy
Lead Archivist	Rebecca R. English, BS

6. INTRODUCTION

This report presents the clinical pathology data for Crl:CD(SD) rats assigned to the study entitled Oral (Diet) Repeated Dose 90-Day Toxicity Study of Malathion Technical in Rats (Study No. TQC00066). The objective of this study was to provide information on possible adverse effects of Crl:CD(SD) rats resulting from repeated exposure to Malathion over an extended period of time covering postweaning maturation and growth well into adulthood. The study was expected to provide information on toxicity, indicate target organs and the possibility of accumulation, and an estimate of a no-observed-adverse-effect level (NOAEL) of exposure that can be used for establishing safety criteria for human exposure.

The study was sponsored by Cheminova A/S, Lemvig, Denmark, where M. Jensen served as the Sponsor Representative. John F. Barnett, Jr., BS, Charles River Laboratories, Preclinical Services, Horsham, Pennsylvania, served as the Study Director.

For the clinical pathology study phase, the experimental start date was 19 Apr 2011 and the experimental completion date was 26 Apr 2011.

7. MATERIALS AND METHODS

Experimental procedures applicable to clinical pathology investigations are summarized below.

Text Table 1
Experimental Design

Group No.	No. of Animals		Test Substance	Concentration (ppm)
	Main Study			
	Male	Female		
I	10	10	Carrier Control	0
II	10	10	Malathion Technical	100
III	10	10	Malathion Technical	500
IV	10	10	Malathion Technical	5000
V	10	10	Malathion Technical	10000
The test substance was considered 95.8% active/pure for the purpose of dosage calculation.				

Blood samples for hematology and clinical chemistry evaluations were collected and processed at the Testing Facility on the day of scheduled sacrifice (DS 91).

7.1. Clinical Pathology Procedures

7.1.1. Hematology

Samples for hematological evaluation were received on refrigerator packs by overnight shipping. The samples were maintained at room temperature for immediate analysis. All samples were analyzed on the Bayer Advia® 120 Automated Hematology Analyzer in accordance with all applicable SOPs for the following parameters:

Text Table 2
Hematology Parameters

Red blood cell (erythrocyte) count	White blood cell (leukocyte) count
Hemoglobin concentration	Neutrophil count
Hematocrit	Lymphocyte count
Mean corpuscular volume	Monocyte count
Mean corpuscular hemoglobin concentration	Eosinophil count
Mean corpuscular hemoglobin	Basophil count
Reticulocyte count (absolute)	Large unstained cells
Platelet count	Other cells (as appropriate)
Mean platelet volume	

Blood smear slides were prepared for all animals for possible RBC morphology evaluation. For each interval, two slides per animal were prepared at the Testing Facility and stained at PCS-OH. Slide review was only performed on samples that met flagging criteria to confirm accurate hematology data.

Hematology summary data are presented in [Table 1](#). Individual hematology animal data are presented in [Appendix 1](#) and [Appendix 2](#).

7.1.2. Clinical Chemistry

Samples for clinical chemistry evaluation were received frozen, on dry ice, by overnight shipping. The samples were stored in a -20°C freezer and then allowed to thaw prior to analysis. All samples were analyzed on the Olympus AU640e Chemistry Analyzer in accordance with all applicable SOPs for the following parameters:

Text Table 3
Clinical Chemistry Parameters

Alanine aminotransferase	Total protein
Aspartate aminotransferase	Albumin
Alkaline phosphatase	Globulin
Gamma-glutamyltransferase	Albumin/globulin ratio
Total bilirubin	Glucose
Urea nitrogen	Cholesterol
Creatinine	Triglycerides
Calcium	Sodium
Phosphorus	Potassium
	Chloride

Clinical chemistry summary data are presented in [Table 2](#). Individual clinical chemistry animal data are presented in [Appendix 3](#).

8. COMPUTERIZED SYSTEMS

Critical computerized systems used in the study are listed. All computerized systems used in the conduct of this study have been validated; when a particular system has not satisfied all requirements, appropriate administrative and procedural controls were implemented to assure the quality and integrity of data.

Text Table 4
Critical Computerized Systems

System Name	Version No.	Description of Data Collected and/or Analyzed
Compaq Alpha DS10 Computer using the Toxicology Analysis System Customized, General Toxicology Module	1.0.0 or higher	Applicable clinical pathology data
Systems 600 Apogee Insight System	3.9.1	Temperature and/or humidity (animal rooms, refrigerators, freezers, and compound storage, as applicable)
Bayer Advia 120 [®] Automated Hematology Analyzer	3.1.8.0-MS	Hematology data
Olympus AU640e	7.3	Clinical chemistry data

The following computer study numbers were used to collect data for the various study phases: TQC66, clinical pathology phase data. The tables and appendices within this report display the applicable computer study number.

9. STATISTICAL ANALYSIS

Statistical analyses were performed for hematology and clinical chemistry.

Each data set was subjected to a statistical decision tree. Data sets for each interval were initially analyzed for homogeneity of variance using Levene's test¹ followed by the Shapiro-Wilk test² for normality. A $p < 0.001$ level of significance was required for each test to reject the null hypothesis.

If both Levene's test and the Shapiro-Wilk test were not significant, a single-factor parametric ANOVA³ was applied, with animal grouping as the factor, using a $p < 0.05$ level of significance. If the parametric ANOVA was significant at $p < 0.05$, Dunnett's test was used to identify statistically significant differences between the control group and each test substance-treated group using a minimum significance level of $p < 0.05$.

If either Levene's test and/or the Shapiro-Wilk test were significant, then the Kruskal-Wallis non-parametric ANOVA⁴ was applied, with animal grouping as the factor, using a $p < 0.05$ level of significance. If the non-parametric Kruskal-Wallis ANOVA was significant at $p < 0.05$, Dunn's test⁵ was used to identify statistically significant differences between the control group and each test substance-treated group using a minimum significance level of $p < 0.05$.

10. RETENTION OF RECORDS, SAMPLES, AND SPECIMENS

Following the completion of analysis and verification of the results, all residual clinical pathology samples were discarded in accordance with applicable SOPs.

All original data, slides, and reports from this study are the property of the Sponsor and will be returned to Charles River Laboratories, Preclinical Services, Pennsylvania for archiving at the completion of the study.

11. REPORT APPROVAL

All samples were received and analyzed in accordance with the Study Protocol and applicable Standard Operating Procedures.



Date: 20 DEC 2011

Rebecca M. Lucke, BS, MT (ASCP)
Principal Investigator

12. REFERENCES

1. Levene H. *Contributions to Probability and Statistics*. Stanford University Press; 1960.
2. Royston P, A remark on algorithm AS 181: the W-test for normality. *Applied Statistics*. 1995 44(4):547-551.
3. Gad SC and Weil CS. *Principles and Methods of Toxicology*. 3rd ed. New York, NY: Raven Press, Ltd.; 1994.
4. Siegel S. *Nonparametric Statistics for the Behavioral Sciences*; 1956.
5. Glantz SA. *Primer of Biostatistics*. 4th ed. The McGraw Hill Companies, Inc.; 1997.

Table 1
Summary of Hematology Data

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TABLE 1

ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

SUMMARY OF HEMATOLOGY DATA				MALES		
GROUP:		1	2	3	4	5
LEVEL PPM:		0	100	500	5000	10000
<hr/>						
ERYTHROCYTES		10*6/CMM				
DAY	91	MEAN	8.22 k	8.52	8.63	8.66
		S.D.	0.886	0.356	0.372	0.319
		N	10	10	10	10
		% difference vs. control		3.7	5.0	5.5
						2.9
HEMOGLOBIN		G/DL				
DAY	91	MEAN	15.1 k	15.6	15.7	15.6
		S.D.	1.63	0.38	0.39	0.51
		N	10	10	10	10
		% difference vs. control		3.3	3.4	2.8
						-0.7
HEMATOCRIT		%				
DAY	91	MEAN	43.7 k	45.3	45.3	45.3
		S.D.	4.88	1.83	2.04	1.53
		N	10	10	10	10
		% difference vs. control		3.6	3.8	3.7
						0.9
<hr/>						
STATISTICAL KEY:		k=KRUSKAL-WALLIS/DUNN'S				

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TABLE 1

ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

SUMMARY OF HEMATOLOGY DATA							MALES
GROUP:			1	2	3	4	5
LEVEL PPM:			0	100	500	5000	10000
MCH		PG					
DAY	91	MEAN	18.4 d	18.4	18.2	18.0	17.8
		S.D.	0.50	0.73	0.57	0.59	0.65
		N	10	10	10	10	10
		% difference vs. control		-0.1	-1.4	-2.4	-3.4
MCHC		G/DL					
DAY	91	MEAN	34.7 d	34.6	34.6	34.4	34.1
		S.D.	0.68	0.78	0.92	0.47	0.51
		N	10	10	10	10	10
		% difference vs. control		-0.1	-0.2	-0.8	-1.6
MCV		FL					
DAY	91	MEAN	53.2 d	53.2	52.6	52.3	52.1
		S.D.	1.48	2.13	1.34	1.56	1.86
		N	10	10	10	10	10
		% difference vs. control		-0.1	-1.2	-1.7	-2.0
STATISTICAL KEY: d=ANOVA/DUNNETT-TEST							

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TABLE 1

ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

SUMMARY OF HEMATOLOGY DATA							MALES
GROUP:			1	2	3	4	5
LEVEL PPM:			0	100	500	5000	10000
RETICULOCYTES		10*9/L					
DAY	91	MEAN	174.8 d	174.3	170.7	195.2	198.9
		S.D.	38.39	17.95	31.61	28.43	32.86
		N	10	10	10	10	10
		% difference vs. control		-0.3	-2.3	11.7	13.7
PLATELETS		10*3/CMM					
DAY	91	MEAN	1068 d	1009	1085	1178	1160
		S.D.	144.2	150.2	208.4	123.3	235.1
		N	10	10	10	10	10
		% difference vs. control		-5.6	1.5	10.3	8.6
MPV		FL					
DAY	91	MEAN	8.3 d	8.3	8.3	8.1	8.4
		S.D.	0.40	0.91	0.60	0.56	0.67
		N	10	10	10	10	10
		% difference vs. control		0.2	0.2	-1.8	2.3
STATISTICAL KEY: d=ANOVA/DUNNETT - TEST							

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TABLE 1

ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

SUMMARY OF HEMATOLOGY DATA				MALES		
GROUP:		1	2	3	4	5
LEVEL PPM:		0	100	500	5000	10000
<hr/>						
LEUKOCYTES		10*3/CMM				
DAY	91	MEAN	10.20 d	9.69	11.19	11.33
		S.D.	2.856	2.359	1.546	4.529
		N	10	10	10	10
		% difference vs. control		-5.1	9.7	11.1
						9.5
LYMPHOCYTES		10*3/CMM				
DAY	91	MEAN	7.41 d	7.43	8.67	8.93
		S.D.	2.704	2.260	0.893	4.025
		N	10	10	10	10
		% difference vs. control		0.3	17.1	20.6
						23.7
MONOCYTES		10*3/CMM				
DAY	91	MEAN	0.26 d	0.23	0.25	0.26
		S.D.	0.111	0.100	0.130	0.128
		N	10	10	10	10
		% difference vs. control		-12.1	-1.2	0.8
						2.7
<hr/>						
STATISTICAL KEY:		d=ANOVA/DUNNETT - TEST				

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TABLE 1

ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

SUMMARY OF HEMATOLOGY DATA				MALES		
GROUP:		1	2	3	4	5
LEVEL PPM:		0	100	500	5000	10000

SEGD NEUTROPHILS 10*3/CMM						
DAY	91	MEAN	2.32 k	1.80	2.02	1.88
		S.D.	2.185	0.912	1.609	1.906
		N	10	10	10	10
		% difference vs. control		-22.5	-12.9	-19.3
						-35.8
EOSINOPHILS 10*3/CMM						
DAY	91	MEAN	0.13 d	0.15	0.13	0.14
		S.D.	0.062	0.065	0.055	0.073
		N	10	10	10	10
		% difference vs. control		13.1	2.3	3.8
						-2.3
BASOPHILS 10*3/CMM						
DAY	91	MEAN	0.03 k	0.03	0.03	0.04
		S.D.	0.017	0.014	0.008	0.023
		N	10	10	10	10
		% difference vs. control		6.9	17.2	31.0
						27.6

STATISTICAL KEY: d=ANOVA/DUNNETT - TEST k=KRUSKAL-WALLIS/DUNN'S						

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TABLE 1

ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

SUMMARY OF HEMATOLOGY DATA						MALES
GROUP:		1	2	3	4	5
LEVEL PPM:		0	100	500	5000	10000
LG UNSTAIN CELL 10*3/CMM						
DAY	91	MEAN	0.061 d	0.052	0.073	0.091
		S.D.	0.0441	0.0278	0.0333	0.0472
		N	10	10	10	10
		% difference vs. control		-14.8	19.7	49.2
STATISTICAL KEY: d=ANOVA/DUNNETT-TEST						

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TABLE 1

ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

SUMMARY OF HEMATOLOGY DATA				FEMALES		
GROUP:		1	2	3	4	5
LEVEL PPM:		0	100	500	5000	10000
<hr/>						
ERYTHROCYTES		10*6/CMM				
DAY	91	MEAN	7.44 d	7.50	7.74	7.85
		S.D.	0.397	0.213	0.276	0.505
		N	9	10	10	10
		% difference vs. control		0.8	4.0	5.5
						4.7
HEMOGLOBIN		G/DL				
DAY	91	MEAN	14.8 d	14.8	15.1	15.1
		S.D.	0.68	0.35	0.57	0.79
		N	9	10	10	10
		% difference vs. control		-0.1	1.7	2.1
						-1.0
HEMATOCRIT		%				
DAY	91	MEAN	41.0 d	41.8	42.5	42.8
		S.D.	1.44	0.88	1.73	1.95
		N	9	10	10	10
		% difference vs. control		1.9	3.7	4.5
						0.5
<hr/>						
STATISTICAL KEY:		d=ANOVA/DUNNETT - TEST				

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TABLE 1

ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

SUMMARY OF HEMATOLOGY DATA							FEMALES
GROUP:			1	2	3	4	5
LEVEL PPM:			0	100	500	5000	10000
MCH		PG					
DAY	91	MEAN	20.0 d	19.8	19.5	19.3	18.8*
		S.D.	0.64	0.58	0.67	0.66	0.65
		N	9	10	10	10	10
		% difference vs. control		-0.9	-2.3	-3.2	-5.6
MCHC		G/DL					
DAY	91	MEAN	36.2 d	35.5	35.5	35.4	35.7
		S.D.	0.61	0.61	0.73	0.95	0.73
		N	9	10	10	10	10
		% difference vs. control		-1.9	-1.9	-2.2	-1.5
MCV		FL					
DAY	91	MEAN	55.1 d	55.7	54.9	54.6	52.9*
		S.D.	1.86	1.47	1.75	2.31	1.49
		N	9	10	10	10	10
		% difference vs. control		1.1	-0.3	-0.9	-4.0
STATISTICAL KEY: d=ANOVA/DUNNETT-TEST * = P<0.05							

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TABLE 1

ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

SUMMARY OF HEMATOLOGY DATA				FEMALES		
GROUP:		1	2	3	4	5
LEVEL PPM:		0	100	500	5000	10000

RETICULOCYTES 10*9/L						
DAY	91	MEAN	168.6 d	155.6	173.7	164.6
		S.D.	25.93	28.76	35.68	23.12
		N	9	10	10	10
		% difference vs. control		-7.7	3.1	-2.3
						-10.8
PLATELETS 10*3/CMM						
DAY	91	MEAN	999 d	1109	1093	1140
		S.D.	108.3	104.6	125.3	134.6
		N	9	10	10	10
		% difference vs. control		11.0	9.4	14.1
						-2.4
MPV FL						
DAY	91	MEAN	7.8 d	8.0	8.2	8.4*
		S.D.	0.39	0.31	0.45	0.45
		N	9	10	10	10
		% difference vs. control		2.9	4.9	7.7
						12.1

STATISTICAL KEY: d=ANOVA/DUNNETT-TEST * = P<0.05						

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TABLE 1

ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

SUMMARY OF HEMATOLOGY DATA				FEMALES		
GROUP:		1	2	3	4	5
LEVEL PPM:		0	100	500	5000	10000
<hr/>						
LEUKOCYTES	10*3/CMM					
DAY 91	MEAN	6.84 d	7.59	6.95	7.13	8.46
	S.D.	2.091	2.618	1.324	2.752	3.107
	N	9	10	10	10	10
	% difference vs. control		10.9	1.6	4.2	23.6
<hr/>						
LYMPHOCYTES	10*3/CMM					
DAY 91	MEAN	5.64 d	5.96	5.82	6.04	7.24
	S.D.	2.083	1.727	1.300	2.616	2.827
	N	9	10	10	10	10
	% difference vs. control		5.6	3.1	7.0	28.4
<hr/>						
MONOCYTES	10*3/CMM					
DAY 91	MEAN	0.14 k	0.20	0.14	0.13	0.19
	S.D.	0.042	0.113	0.038	0.051	0.120
	N	9	10	10	10	10
	% difference vs. control		41.4	-0.7	-4.3	32.9
<hr/>						
STATISTICAL KEY:		d=ANOVA/DUNNETT - TEST	k=KRUSKAL-WALLIS/DUNN'S			

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TABLE 1

ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

SUMMARY OF HEMATOLOGY DATA				FEMALES		
GROUP:		1	2	3	4	5
LEVEL PPM:		0	100	500	5000	10000

SEGD NEUTROPHILS 10*3/CMM						
DAY	91	MEAN	0.88 k	1.25	0.85	0.81
		S.D.	0.663	1.006	0.238	0.228
		N	9	10	10	10
		% difference vs. control		42.5	-3.2	-7.3
						-7.1
EOSINOPHILS 10*3/CMM						
DAY	91	MEAN	0.12 k	0.11	0.08	0.09
		S.D.	0.086	0.028	0.024	0.035
		N	9	10	10	10
		% difference vs. control		-10.0	-32.7	-30.3
						-0.3
BASOPHILS 10*3/CMM						
DAY	91	MEAN	0.02 k	0.02	0.01	0.02
		S.D.	0.007	0.012	0.007	0.011
		N	9	10	10	10
		% difference vs. control		-10.0	-15.6	-10.0
						23.7

STATISTICAL KEY: k=KRUSKAL-WALLIS/DUNN'S						

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TABLE 1

ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

SUMMARY OF HEMATOLOGY DATA							FEMALES
GROUP:		1	2	3	4	5	
LEVEL PPM:		0	100	500	5000	10000	
LG UNSTAIN CELL 10*3/CMM							
DAY	91	MEAN	0.046 d	0.063	0.050	0.045	0.071
		S.D.	0.0436	0.0306	0.0245	0.0363	0.0605
		N	9	10	10	10	10
		% difference vs. control		38.3	9.8	-1.2	55.9
STATISTICAL KEY:							d=ANOVA/DUNNETT-TEST

Table 2
Summary of Clinical Chemistry Data

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TABLE 2

ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

SUMMARY OF CLINICAL CHEMISTRY DATA				MALES		
GROUP:		1	2	3	4	5
LEVEL PPM:		0	100	500	5000	10000
<hr/>						
AST	IU/L					
DAY 91	MEAN	119 d	110	109	84*	83*
	S.D.	38.4	24.9	36.9	13.8	20.9
	N	10	10	10	10	10
	% difference vs. control		-7.2	-8.0	-29.1	-30.3
ALT	IU/L					
DAY 91	MEAN	32 k	29	27	23	24
	S.D.	20.2	8.4	4.3	4.1	7.9
	N	10	10	10	10	10
	% difference vs. control		-11.5	-17.6	-28.5	-24.8
ALK PHOS'TASE	IU/L					
DAY 91	MEAN	95 d	72*	87	72*	66*
	S.D.	28.5	15.8	20.6	18.6	14.8
	N	10	10	10	10	10
	% difference vs. control		-24.4	-8.7	-24.2	-30.3
<hr/>						
STATISTICAL KEY: d=ANOVA/DUNNETT-TEST k=KRUSKAL-WALLIS/DUNN'S * = P<0.05						

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TABLE 2

ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

SUMMARY OF CLINICAL CHEMISTRY DATA				MALES		
GROUP:		1	2	3	4	5
LEVEL PPM:		0	100	500	5000	10000
<hr/>						
GGT, SERUM		IU/L				
DAY	91	MEAN	0.00 k	0.00	0.00	2.20*
		S.D.	0.000	0.000	0.009	2.027
		N	10	10	10	10
		% difference vs. control				
<hr/>						
TOTAL BILIRUBIN		MG/DL				
DAY	91	MEAN	0.15 d	0.15	0.14	0.15
		S.D.	0.029	0.037	0.031	0.020
		N	10	10	10	10
		% difference vs. control		4.1	-3.4	4.1
<hr/>						
CHOLESTEROL		MG/DL				
DAY	91	MEAN	64 k	59	96*	118*
		S.D.	17.5	14.4	19.5	30.9
		N	10	10	10	10
		% difference vs. control		-7.6	51.2	85.4
<hr/>						
STATISTICAL KEY: d=ANOVA/DUNNETT-TEST k=KRUSKAL-WALLIS/DUNN'S * = P<0.05						

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TABLE 2

ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

SUMMARY OF CLINICAL CHEMISTRY DATA				MALES		
GROUP:		1	2	3	4	5
LEVEL PPM:		0	100	500	5000	10000
<hr/>						
TRIGLYCERIDE	MG/DL					
DAY 91	MEAN	72 k	49	58	66	73
	S.D.	47.9	15.9	14.0	15.3	47.9
	N	10	10	10	10	10
	% difference vs. control		-32.0	-20.5	-9.3	1.4
<hr/>						
TOTAL PROTEIN	G/DL					
DAY 91	MEAN	5.78 d	5.76	5.88	6.28*	6.32*
	S.D.	0.487	0.267	0.249	0.375	0.342
	N	10	10	10	10	10
	% difference vs. control		-0.3	1.7	8.6	9.3
<hr/>						
ALBUMIN	G/DL					
DAY 91	MEAN	3.01 d	2.99	3.04	3.21*	3.21*
	S.D.	0.204	0.112	0.127	0.181	0.155
	N	10	10	10	10	10
	% difference vs. control		-0.9	0.8	6.6	6.6
<hr/>						
STATISTICAL KEY: d=ANOVA/DUNNETT-TEST k=KRUSKAL-WALLIS/DUNN'S * = P<0.05						

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TABLE 2

ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

			SUMMARY OF CLINICAL CHEMISTRY DATA				MALES
			1	2	3	4	5
			0	100	500	5000	10000
GLOBULIN							
			G/DL				
DAY	91	MEAN	2.77 d	2.78	2.84	3.06*	3.11*
		S.D.	0.330	0.249	0.175	0.231	0.229
		N	10	10	10	10	10
		% difference vs. control		0.3	2.7	10.7	12.3
A/G RATIO							
			RATIO				
DAY	91	MEAN	1.10 d	1.08	1.07	1.05	1.04
		S.D.	0.113	0.105	0.063	0.059	0.069
		N	10	10	10	10	10
		% difference vs. control		-1.5	-2.6	-4.5	-5.5
GLUCOSE							
			MG/DL				
DAY	91	MEAN	141 d	122	132	147	153
		S.D.	27.5	19.6	12.6	12.8	16.5
		N	10	10	10	10	10
		% difference vs. control		-13.4	-5.8	4.6	9.0
STATISTICAL KEY: d=ANOVA/DUNNETT-TEST * = P<0.05							

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ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

SUMMARY OF CLINICAL CHEMISTRY DATA				MALES		
GROUP:		1	2	3	4	5
LEVEL PPM:		0	100	500	5000	10000
<hr/>						
UREA NITROGEN		MG/DL				
DAY	91	MEAN	15 k	12	11	11
		S.D.	8.6	2.2	1.5	1.5
		N	10	10	10	10
		% difference vs. control		-20.7	-24.7	-29.3
CREATININE		MG/DL				
DAY	91	MEAN	0.31 d	0.28	0.30	0.25*
		S.D.	0.058	0.031	0.032	0.022
		N	10	10	10	10
		% difference vs. control		-8.7	-5.4	-11.2
CALCIUM		MG/DL				
DAY	91	MEAN	9.87 d	9.82	10.04	10.11
		S.D.	0.357	0.289	0.330	0.231
		N	10	10	10	10
		% difference vs. control		-0.5	1.7	2.4
<hr/>						
STATISTICAL KEY: d=ANOVA/DUNNETT-TEST k=KRUSKAL-WALLIS/DUNN'S * = P<0.05						

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ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

SUMMARY OF CLINICAL CHEMISTRY DATA				MALES		
GROUP:		1	2	3	4	5
LEVEL PPM:		0	100	500	5000	10000
<hr/>						
PHOSPHORUS	MG/DL					
DAY 91	MEAN	6.57 k	6.65	6.91	6.68	6.68
	S.D.	0.879	0.412	0.235	0.230	0.453
	N	10	10	10	10	10
	% difference vs. control		1.2	5.2	1.7	1.6
SODIUM	MMOL/L					
DAY 91	MEAN	142 k	143	142	142	143
	S.D.	1.9	1.1	1.0	0.7	1.0
	N	10	10	10	10	10
	% difference vs. control		0.2	0.1	0.1	0.3
POTASSIUM	MMOL/L					
DAY 91	MEAN	4.86 d	4.84	4.95	5.01	5.07
	S.D.	0.342	0.312	0.305	0.196	0.296
	N	10	10	10	10	10
	% difference vs. control		-0.5	1.9	3.2	4.3
<hr/>						
STATISTICAL KEY:		d=ANOVA/DUNNETT - TEST	k=KRUSKAL-WALLIS/DUNN'S			

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TABLE 2

ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

SUMMARY OF CLINICAL CHEMISTRY DATA							MALES
GROUP:		1	2	3	4	5	
LEVEL PPM:		0	100	500	5000	10000	
CHLORIDE							
MMOL/L							
DAY	91	MEAN	103 d	104	104	105	
		S.D.	2.0	1.3	1.2	1.3	
		N	10	10	10	10	
		% difference vs. control		1.1	0.7	1.2	
STATISTICAL KEY: d=ANOVA/DUNNETT-TEST							

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TABLE 2

ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

SUMMARY OF CLINICAL CHEMISTRY DATA							FEMALES
GROUP:			1	2	3	4	5
LEVEL PPM:			0	100	500	5000	10000
AST		IU/L					
DAY	91	MEAN	118 k	104	98	96	77
		S.D.	90.8	18.1	17.5	20.0	18.2
		N	10	10	10	10	10
		% difference vs. control		-12.5	-17.3	-19.3	-35.3
ALT		IU/L					
DAY	91	MEAN	39 k	27	27	24	22
		S.D.	43.6	7.4	11.0	8.8	8.8
		N	10	10	10	10	10
		% difference vs. control		-30.3	-31.1	-38.3	-43.7
ALK PHOS'TASE		IU/L					
DAY	91	MEAN	61 k	55	43	49	35*
		S.D.	22.7	25.9	12.4	13.9	8.5
		N	10	10	10	10	10
		% difference vs. control		-9.7	-29.7	-20.3	-42.5
STATISTICAL KEY: k=KRUSKAL-WALLIS/DUNN'S * = P<0.05							

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ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

SUMMARY OF CLINICAL CHEMISTRY DATA							FEMALES
GROUP:			1	2	3	4	5
LEVEL PPM:			0	100	500	5000	10000
GGT,SERUM		IU/L					
DAY	91	MEAN	0.11 k	0.15	0.11	0.55	0.87*
		S.D.	0.163	0.199	0.252	0.381	0.816
		N	10	10	10	10	10
		% difference vs. control		39.8	0.0	405.6	701.9
TOTAL BILIRUBIN		MG/DL					
DAY	91	MEAN	0.14 d	0.15	0.16	0.15	0.13
		S.D.	0.028	0.031	0.026	0.019	0.012
		N	10	10	10	10	10
		% difference vs. control		6.4	10.6	7.1	-5.0
CHOLESTEROL		MG/DL					
DAY	91	MEAN	71 d	75	74	88	119*
		S.D.	19.6	15.3	11.9	25.4	22.6
		N	10	10	10	10	10
		% difference vs. control		6.2	3.7	23.8	68.3
STATISTICAL KEY:			d=ANOVA/DUNNETT-TEST	k=KRUSKAL-WALLIS/DUNN'S	* = P<0.05		

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TABLE 2

ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

SUMMARY OF CLINICAL CHEMISTRY DATA				FEMALES		
GROUP:		1	2	3	4	5
LEVEL PPM:		0	100	500	5000	10000
<hr/>						
TRIGLYCERIDE	MG/DL					
DAY 91	MEAN	49 d	42	50	50	44
	S.D.	15.9	6.8	15.8	11.4	7.9
	N	10	10	10	10	10
	% difference vs. control		-15.0	1.2	1.4	-10.0
<hr/>						
TOTAL PROTEIN	G/DL					
DAY 91	MEAN	6.27 d	6.12	6.34	6.39	6.57
	S.D.	0.420	0.131	0.446	0.492	0.309
	N	10	10	10	10	10
	% difference vs. control		-2.4	1.1	1.8	4.8
<hr/>						
ALBUMIN	G/DL					
DAY 91	MEAN	3.45 d	3.35	3.54	3.54	3.61
	S.D.	0.245	0.192	0.307	0.214	0.166
	N	10	10	10	10	10
	% difference vs. control		-3.0	2.3	2.6	4.5
<hr/>						
STATISTICAL KEY: d=ANOVA/DUNNETT - TEST						

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ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

SUMMARY OF CLINICAL CHEMISTRY DATA				FEMALES		
GROUP:		1	2	3	4	5
LEVEL PPM:		0	100	500	5000	10000
<hr/>						
GLOBULIN	G/DL					
DAY 91	MEAN	2.82 d	2.77	2.80	2.84	2.97
	S.D.	0.210	0.173	0.189	0.315	0.168
	N	10	10	10	10	10
	% difference vs. control		-1.7	-0.5	0.9	5.3
A/G RATIO	RATIO					
DAY 91	MEAN	1.23 d	1.22	1.26	1.26	1.22
	S.D.	0.069	0.135	0.092	0.097	0.051
	N	10	10	10	10	10
	% difference vs. control		-1.1	2.7	2.2	-0.9
GLUCOSE	MG/DL					
DAY 91	MEAN	135 d	133	134	148	149
	S.D.	15.1	19.5	11.2	23.7	12.8
	N	10	10	10	10	10
	% difference vs. control		-1.5	-1.2	9.2	10.1
<hr/>						
STATISTICAL KEY:		d=ANOVA/DUNNETT-TEST				

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ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

SUMMARY OF CLINICAL CHEMISTRY DATA				FEMALES		
GROUP:		1	2	3	4	5
LEVEL PPM:		0	100	500	5000	10000
<hr/>						
UREA NITROGEN		MG/DL				
DAY	91	MEAN	13 d	13	12	10*
		S.D.	1.7	2.0	1.3	1.7
		N	10	10	10	10
		% difference vs. control		4.8	-0.8	-19.2
<hr/>						
CREATININE		MG/DL				
DAY	91	MEAN	0.37 d	0.37	0.35	0.31*
		S.D.	0.029	0.041	0.061	0.032
		N	10	10	10	10
		% difference vs. control		0.0	-4.9	-15.5
<hr/>						
CALCIUM		MG/DL				
DAY	91	MEAN	10.20 d	10.08	10.36	10.32
		S.D.	0.321	0.226	0.461	0.246
		N	10	10	10	10
		% difference vs. control		-1.2	1.6	1.2
<hr/>						
STATISTICAL KEY: d=ANOVA/DUNNETT-TEST * = P<0.05						

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TABLE 2

ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

SUMMARY OF CLINICAL CHEMISTRY DATA				FEMALES		
GROUP:		1	2	3	4	5
LEVEL PPM:		0	100	500	5000	10000
<hr/>						
PHOSPHORUS	MG/DL					
DAY 91	MEAN	5.78 d	5.99	5.94	6.13	5.77
	S.D.	0.722	0.588	0.459	0.330	0.364
	N	10	10	10	10	10
	% difference vs. control		3.6	2.8	6.1	-0.2
SODIUM	MMOL/L					
DAY 91	MEAN	143 d	143	143	144	143
	S.D.	1.3	1.3	1.5	1.1	0.8
	N	10	10	10	10	10
	% difference vs. control		-0.2	0.1	0.5	-0.3
POTASSIUM	MMOL/L					
DAY 91	MEAN	4.12 d	4.16	4.45*	4.41	4.45*
	S.D.	0.314	0.314	0.277	0.235	0.251
	N	10	10	10	10	10
	% difference vs. control		1.1	8.2	7.2	8.2
<hr/>						
STATISTICAL KEY: d=ANOVA/DUNNETT-TEST * = P<0.05						

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ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

SUMMARY OF CLINICAL CHEMISTRY DATA						FEMALES
GROUP:		1	2	3	4	5
LEVEL PPM:		0	100	500	5000	10000

CHLORIDE	MMOL/L					
DAY 91	MEAN	106 d	106	106	106	105
	S.D.	1.9	1.4	1.2	1.0	1.5
	N	10	10	10	10	10
	% difference vs. control		-0.1	-0.5	-0.6	-1.2

STATISTICAL KEY:		d=ANOVA/DUNNETT-TEST				

Appendix 1
Individual Hematology Data

Hematology Explanation Page**Bayer Advia 120® Automated Hematology Analyzer**

Analyzed Parameter Descriptions			
Parameter	Abbreviation	Units	Methodology
Leukocytes	--	10 ³ /cmm	Flow Cytometry
Erythrocytes	--	10 ⁶ /cmm	Flow Cytometry
Hemoglobin	--	g/dL	Colormetric
Hematocrit	--	%	Calculation
Mean Corpuscular Volume	MCV	fL	
Mean Corpuscular Hemoglobin	MCH	pg	Calculation
Mean Corpuscular Hemoglobin Concentration	MCHC	g/dL	Calculation
Platelets	--	10 ³ /cmm	Flow Cytometry
Segmented Neutrophils (relative)	Segd Neutrophils	% WBC	Flow Cytometry
Lymphocytes (relative)	--	% WBC	Flow Cytometry
Monocytes (relative)	--	% WBC	Flow Cytometry
Basophils (relative)	--	% WBC	Flow Cytometry
Eosinophils (relative)	--	% WBC	Flow Cytometry
Non-Segmented Neutrophils (Bands) (relative)	--	% WBC	Visual Observation
Nucleated Red Blood Cells	--	#100 WBC	Visual Observation
Reticulocytes (relative)	--	% RBC	Flow Cytometry
Erythrocyte Sed. Rate	--	mm/hr	Visual Observation
Clotting Time	--	Minutes	Timed Observation
Segmented Neutrophils (absolute)	Segd Neutrophils	10 ³ /cmm	Flow Cytometry
Lymphocytes (absolute)	--	10 ³ /cmm	Flow Cytometry
Monocytes (absolute)	--	10 ³ /cmm	Flow Cytometry
Basophils (absolute)	--	10 ³ /cmm	Flow Cytometry
Eosinophils (absolute)	--	10 ³ /cmm	Flow Cytometry
Non-Segmented Neutrophils (Bands) (absolute)	--	10 ³ /cmm	Visual Observation
Platelet Crit	--	%	Calculation
Hgb Distribution Width	--	g/dL	Calculation
Platelet Distribution Width	--	%	Calculation
Mean Platelet Volume	MPV	fL	
Red Distribution Width	--	%	Calculation
Reticulocytes (absolute)	--	10 ⁹ /L	Flow Cytometry
Large Unstained Cells (absolute)	Lg Unstain Cell	10 ³ /cmm	Flow Cytometry
Large Unstained Cells (relative)	Lg Unstain Cell	% WBC	Flow Cytometry
CHCM	--	g/dL	Calculation

Other Abbreviations

Abbreviation	Description	Abbreviation	Description
N/A	Not applicable	fL	Femtoliter
N	Number of observations	g/dL	Grams per deciliter
S.D.	Standard deviation	pg	Picogram
QNS	Quantity not sufficient for analysis		

Note: This is a comprehensive list of parameters and abbreviations. All of the parameters and abbreviations listed may not be applicable to this report.

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APPENDIX 1

ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL HEMATOLOGY DATA

DAY	91	MALES										
ANIMAL#	ERYTHRO- CYTES 10*6/CMM	HEMO- GLOBIN G/DL	HEMA- TOCRIT %	MCH PG	MCHC G/DL	MCV FL	RETICU- LOCYTES 10*9/L	PLATE- LETS 10*3/CMM	MPV FL	LEUKO- CYTES 10*3/CMM	LYMPHO- CYTES 10*3/CMM	MONO- CYTES 10*3/CMM
GROUP 1 :0 PPM												
3776 M	9.20	16.3	48.0	17.7	33.9	52.2	145.6	1025	8.3	9.01	7.05	0.23
3777 M	8.60	16.4	48.2	19.1	34.1	56.1	265.5	874	8.9	9.54	8.10	0.16
3778 M	5.91	10.8	31.4	18.2	34.3	53.2	144.5	1123	8.0	10.38	2.49	0.22
3779 M	8.67	15.9	47.1	18.3	33.7	54.4	198.0	1377	8.5	16.60	11.13	0.34
3780 M	8.77	16.0	46.3	18.2	34.5	52.9	181.5	1136	8.3	9.01	6.91	0.28
3781 M	7.91	14.8	42.3	18.8	35.1	53.4	169.2	990	8.4	6.06	4.01	0.26
3782 M	8.28	14.7	41.9	17.7	35.1	50.6	153.3	1117	8.7	8.12	6.58	0.21
3783 M	8.24	15.5	44.5	18.8	34.8	54.0	128.9	880	7.6	12.47	9.69	0.53
3784 M	8.21	15.6	43.7	19.0	35.8	53.2	178.9	1092	7.9	11.52	10.48	0.16
3785 M	8.36	15.4	43.5	18.4	35.4	52.1	182.8	1068	7.9	9.32	7.63	0.18
MEAN	8.22	15.1	43.7	18.4	34.7	53.2	174.8	1068	8.3	10.20	7.41	0.26
S.D.	0.886	1.63	4.88	0.50	0.68	1.48	38.39	144.2	0.40	2.856	2.704	0.111
N	10	10	10	10	10	10	10	10	10	10	10	10

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APPENDIX 1

ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL HEMATOLOGY DATA

DAY	91	MALES										
ANIMAL#	ERYTHRO- CYTES 10*6/CMM	HEMO- GLOBIN G/DL	HEMA- TOCRIT %	MCH PG	MCHC G/DL	MCV FL	RETICU- LOCYTES 10*9/L	PLATE- LETS 10*3/CMM	MPV FL	LEUKO- CYTES 10*3/CMM	LYMPHO- CYTES 10*3/CMM	MONO- CYTES 10*3/CMM
GROUP 2 :100 PPM												
3726 M	8.27	15.9	46.4	19.3	34.3	56.1	188.9	978	8.0	7.47	6.06	0.11
3727 M	9.29	16.4	49.1	17.7	33.5	52.8	158.3	1119	7.9	6.74	5.80	0.10
3728 M	8.64	15.4	45.6	17.9	33.9	52.8	207.0	948	8.8	9.54	7.71	0.22
3729 M	8.34	15.5	45.8	18.6	33.9	55.0	154.7	1136	8.7	9.60	4.94	0.40
3730 M	8.69	15.8	46.3	18.2	34.2	53.3	193.2	941	8.6	7.92	5.92	0.20
3731 M	8.37	16.0	44.9	19.1	35.6	53.7	174.0	666	10.4	10.26	7.65	0.24
3732 M	8.13	15.5	44.5	19.1	34.9	54.8	166.0	1028	7.8	8.62	6.28	0.29
3733 M	8.18	15.5	43.5	19.0	35.7	53.2	152.1	1226	7.7	10.63	8.15	0.13
3734 M	8.84	15.2	42.8	17.1	35.4	48.3	179.6	1015	7.5	15.10	12.76	0.35
3735 M	8.40	15.2	43.6	18.1	35.0	51.8	168.8	1030	7.3	10.98	9.04	0.22
MEAN	8.52	15.6	45.3	18.4	34.6	53.2	174.3	1009	8.3	9.69	7.43	0.23
S.D.	0.356	0.38	1.83	0.73	0.78	2.13	17.95	150.2	0.91	2.359	2.260	0.100
N	10	10	10	10	10	10	10	10	10	10	10	10

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ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL HEMATOLOGY DATA

DAY	91	MALES										
ANIMAL#	ERYTHRO- CYTES 10*6/CMM	HEMO- GLOBIN G/DL	HEMA- TOCRIT %	MCH PG	MCHC G/DL	MCV FL	RETICU- LOCYTES 10*9/L	PLATE- LETS 10*3/CMM	MPV FL	LEUKO- CYTES 10*3/CMM	LYMPHO- CYTES 10*3/CMM	MONO- CYTES 10*3/CMM
GROUP 3 :500 PPM												
3801 M	8.77	16.0	46.8	18.3	34.3	53.4	180.0	1390	8.5	11.13	9.53	0.15
3802 M	8.86	15.9	47.0	17.9	33.8	53.1	168.7	1210	8.5	14.26	7.14	0.41
3803 M	8.98	15.9	47.5	17.7	33.4	53.0	217.2	1454	8.9	11.45	8.36	0.20
3804 M	8.78	16.3	47.9	18.5	34.0	54.5	224.2	997	9.0	13.06	9.85	0.54
3805 M	8.53	15.3	45.2	17.9	33.9	53.0	179.6	907	8.8	10.49	8.89	0.25
12250 M	8.31	15.1	43.2	18.2	35.0	52.0	158.2	902	8.4	8.81	7.34	0.14
3807 M	8.28	15.3	42.4	18.5	36.2	51.2	126.6	1108	8.0	10.58	8.91	0.27
3808 M	7.93	15.4	42.8	19.4	35.9	53.9	148.1	1087	7.5	11.34	9.06	0.24
3809 M	9.18	15.9	46.2	17.3	34.4	50.3	136.3	878	7.9	10.97	9.33	0.12
3810 M	8.66	15.5	44.3	17.9	35.0	51.2	168.3	912	7.2	9.80	8.29	0.22
MEAN	8.63	15.7	45.3	18.2	34.6	52.6	170.7	1085	8.3	11.19	8.67	0.25
S.D.	0.372	0.39	2.04	0.57	0.92	1.34	31.61	208.4	0.60	1.546	0.893	0.130
N	10	10	10	10	10	10	10	10	10	10	10	10

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ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL HEMATOLOGY DATA

DAY	91	MALES										
ANIMAL#	ERYTHRO- CYTES 10*6/CMM	HEMO- GLOBIN G/DL	HEMA- TOCRIT %	MCH PG	MCHC G/DL	MCV FL	RETICU- LOCYTES 10*9/L	PLATE- LETS 10*3/CMM	MPV FL	LEUKO- CYTES 10*3/CMM	LYMPHO- CYTES 10*3/CMM	MONO- CYTES 10*3/CMM
GROUP 4 :5000 PPM												
3751 M	8.54	16.1	46.5	18.8	34.5	54.5	229.4	1235	8.2	10.31	8.36	0.26
3752 M	8.39	15.4	45.1	18.3	34.1	53.8	185.0	1123	9.1	5.28	4.19	0.09
3753 M	8.66	15.5	44.8	17.9	34.7	51.7	154.5	1212	8.3	6.51	5.03	0.10
3754 M	9.19	15.5	46.3	16.9	33.6	50.4	234.4	1241	8.3	7.48	6.45	0.12
3755 M	8.70	15.4	45.3	17.7	33.9	52.1	191.7	1235	8.4	15.10	7.37	0.37
3756 M	8.77	16.4	47.4	18.7	34.6	54.1	178.3	1087	8.6	10.63	9.29	0.24
3757 M	8.77	15.2	44.2	17.3	34.4	50.4	197.5	1020	7.7	13.37	11.26	0.26
3758 M	9.03	16.0	45.8	17.8	35.1	50.7	174.2	1094	7.3	20.72	18.43	0.48
3759 M	8.54	15.6	45.7	18.2	34.1	53.4	234.5	1449	7.5	12.69	10.66	0.36
3760 M	8.05	14.6	41.8	18.1	34.9	52.0	172.4	1086	7.6	11.23	8.30	0.31
MEAN	8.66	15.6	45.3	18.0	34.4	52.3	195.2	1178	8.1	11.33	8.93	0.26
S.D.	0.319	0.51	1.53	0.59	0.47	1.56	28.43	123.3	0.56	4.529	4.025	0.128
N	10	10	10	10	10	10	10	10	10	10	10	10

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ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL HEMATOLOGY DATA

DAY	91	MALES										
ANIMAL#	ERYTHRO- CYTES 10*6/CMM	HEMO- GLOBIN G/DL	HEMA- TOCRIT %	MCH PG	MCHC G/DL	MCV FL	RETICU- LOCYTES 10*9/L	PLATE- LETS 10*3/CMM	MPV FL	LEUKO- CYTES 10*3/CMM	LYMPHO- CYTES 10*3/CMM	MONO- CYTES 10*3/CMM
GROUP 5 :10000 PPM												
3701 M	8.10	14.8	43.3	18.3	34.2	53.4	183.3	1214	8.5	6.58	5.80	0.11
18077 M	8.97	15.9	47.1	17.7	33.8	52.5	186.5	1323	8.7	9.55	5.95	0.26
3703 M	8.34	15.0	44.4	18.0	33.7	53.3	191.6	1316	8.6	12.42	11.25	0.20
3704 M	8.04	13.6	40.5	17.0	33.6	50.4	137.3	1076	8.3	7.70	5.57	0.11
3705 M	8.80	15.3	46.2	17.4	33.2	52.4	198.0	1040	8.8	8.85	7.42	0.16
3706 M	8.51	14.7	42.7	17.3	34.4	50.2	182.3	1411	8.5	11.64	9.81	0.39
3707 M	8.40	14.1	40.8	16.8	34.6	48.5	258.4	1360	7.8	9.45	7.41	0.28
3708 M	8.45	15.9	46.2	18.8	34.3	54.7	200.7	1075	7.5	13.86	12.02	0.36
3709 M	8.52	15.6	44.8	18.3	34.9	52.6	213.6	1183	7.8	13.49	11.87	0.30
3710 M	8.43	15.4	44.9	18.3	34.3	53.3	236.8	602	9.9	18.22	14.51	0.47
MEAN	8.46	15.0	44.1	17.8	34.1	52.1	198.9	1160	8.4	11.18	9.16	0.26
S.D.	0.280	0.75	2.25	0.65	0.51	1.86	32.86	235.1	0.67	3.467	3.154	0.121
N	10	10	10	10	10	10	10	10	10	10	10	10

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ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL HEMATOLOGY DATA

DAY 91 MALES

ANIMAL#	SEGD NEUTRO- PHILS 10*3/CMM	EOSINO- PHILS 10*3/CMM	BASO- PHILS 10*3/CMM	LG UNSTAIN CELL 10*3/CMM
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GROUP 1 :0 PPM

3776 M	1.45	0.22	0.04	0.030
3777 M	1.08	0.12	0.04	0.050
3778 M	7.61	0.03	0.01	0.030
3779 M	4.83	0.08	0.06	0.170
3780 M	1.54	0.19	0.02	0.080
3781 M	1.65	0.11	0.01	0.030
3782 M	1.11	0.17	0.01	0.030
3783 M	2.03	0.13	0.03	0.060
3784 M	0.70	0.06	0.03	0.090
3785 M	1.24	0.19	0.04	0.040
MEAN	2.32	0.13	0.03	0.061
S.D.	2.185	0.062	0.017	0.0441
N	10	10	10	10

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INDIVIDUAL HEMATOLOGY DATA

DAY 91 MALES

ANIMAL#	SEGD NEUTRO- PHILS 10*3/CMM	EOSINO- PHILS 10*3/CMM	BASO- PHILS 10*3/CMM	LG UNSTAIN CELL 10*3/CMM
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GROUP 2 :100 PPM

3726 M	1.12	0.14	0.02	0.020
3727 M	0.72	0.08	0.02	0.030
3728 M	1.44	0.11	0.03	0.030
3729 M	4.11	0.07	0.02	0.060
3730 M	1.60	0.15	0.02	0.030
3731 M	2.04	0.24	0.03	0.060
3732 M	1.78	0.22	0.02	0.040
3733 M	2.11	0.09	0.06	0.080
3734 M	1.71	0.13	0.04	0.110
3735 M	1.37	0.24	0.05	0.060
MEAN	1.80	0.15	0.03	0.052
S.D.	0.912	0.065	0.014	0.0278
N	10	10	10	10

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INDIVIDUAL HEMATOLOGY DATA

DAY 91 MALES

ANIMAL#	SEGD NEUTRO- PHILS 10*3/CMM	EOSINO- PHILS 10*3/CMM	BASO- PHILS 10*3/CMM	LG UNSTAIN CELL 10*3/CMM
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GROUP 3 :500 PPM

3801 M	1.27	0.11	0.03	0.040
3802 M	6.35	0.16	0.04	0.160
3803 M	2.52	0.27	0.03	0.080
3804 M	2.39	0.14	0.05	0.080
3805 M	1.19	0.07	0.04	0.060
12250 M	1.12	0.11	0.03	0.060
3807 M	1.18	0.15	0.03	0.050
3808 M	1.81	0.11	0.03	0.080
3809 M	1.33	0.09	0.04	0.060
3810 M	1.08	0.12	0.02	0.060
MEAN	2.02	0.13	0.03	0.073
S.D.	1.609	0.055	0.008	0.0333
N	10	10	10	10

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INDIVIDUAL HEMATOLOGY DATA

DAY 91 MALES

ANIMAL#	SEGD NEUTRO- PHILS 10*3/CMM	EOSINO- PHILS 10*3/CMM	BASO- PHILS 10*3/CMM	LG UNSTAIN CELL 10*3/CMM
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GROUP 4 :5000 PPM

3751 M	1.38	0.11	0.04	0.150
3752 M	0.87	0.07	0.02	0.030
3753 M	1.28	0.07	0.02	0.030
3754 M	0.76	0.06	0.02	0.060
3755 M	7.15	0.09	0.04	0.080
3756 M	0.83	0.14	0.03	0.100
3757 M	1.52	0.20	0.03	0.090
3758 M	1.32	0.29	0.10	0.100
3759 M	1.32	0.13	0.04	0.180
3760 M	2.32	0.19	0.04	0.090
MEAN	1.88	0.14	0.04	0.091
S.D.	1.906	0.073	0.023	0.0472
N	10	10	10	10

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INDIVIDUAL HEMATOLOGY DATA

DAY 91 MALES

ANIMAL#	SEGD NEUTRO- PHILS 10*3/CMM	EOSINO- PHILS 10*3/CMM	BASO- PHILS 10*3/CMM	LG UNSTAIN CELL 10*3/CMM
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GROUP 5 :10000 PPM

3701 M	0.54	0.07	0.02	0.050
18077 M	3.15	0.11	0.02	0.050
3703 M	0.73	0.11	0.04	0.090
3704 M	1.87	0.08	0.02	0.050
3705 M	1.15	0.05	0.02	0.060
3706 M	1.12	0.10	0.04	0.180
3707 M	1.53	0.13	0.03	0.070
3708 M	1.07	0.20	0.06	0.140
3709 M	1.02	0.11	0.04	0.160
3710 M	2.75	0.31	0.08	0.090
MEAN	1.49	0.13	0.04	0.094
S.D.	0.858	0.076	0.020	0.0488
N	10	10	10	10

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ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL HEMATOLOGY DATA

DAY	91	FEMALES										
ANIMAL#	ERYTHRO- CYTES 10*6/CMM	HEMO- GLOBIN G/DL	HEMA- TOCRIT %	MCH PG	MCHC G/DL	MCV FL	RETICU- LOCYTES 10*9/L	PLATE- LETS 10*3/CMM	MPV FL	LEUKO- CYTES 10*3/CMM	LYMPHO- CYTES 10*3/CMM	MONO- CYTES 10*3/CMM
GROUP 1 :0 PPM												
3901 F	7.07	13.8	39.0	19.5	35.3	55.1	178.4	1038	8.3	7.61	4.45	0.21
3902 F	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS	CS
3903 F	7.87	16.0	42.6	20.3	37.5	54.1	151.3	907	7.9	7.51	6.29	0.11
3904 F	7.18	14.6	40.4	20.4	36.1	56.3	144.7	1007	7.4	11.44	10.56	0.12
3905 F	7.52	14.9	41.7	19.8	35.7	55.5	180.0	1123	7.4	7.34	6.53	0.11
3906 F	7.16	14.1	39.1	19.7	36.2	54.5	159.3	1079	7.8	4.61	4.01	0.11
3907 F	7.93	15.4	42.5	19.4	36.2	53.6	169.6	910	7.7	5.86	4.92	0.18
3908 F	7.44	14.6	40.0	19.7	36.6	53.7	138.4	964	7.3	4.52	3.76	0.10
3909 F	7.91	15.4	42.5	19.5	36.2	53.7	169.4	818	8.4	5.74	4.56	0.13
3910 F	6.87	14.7	40.8	21.4	36.0	59.4	225.9	1141	7.8	6.97	5.70	0.19
MEAN	7.44	14.8	41.0	20.0	36.2	55.1	168.6	999	7.8	6.84	5.64	0.14
S.D.	0.397	0.68	1.44	0.64	0.61	1.86	25.93	108.3	0.39	2.091	2.083	0.042
N	9	9	9	9	9	9	9	9	9	9	9	9

CS=CLOTTED SAMPLE

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ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL HEMATOLOGY DATA

DAY	91	FEMALES										
ANIMAL#	ERYTHRO- CYTES 10*6/CMM	HEMO- GLOBIN G/DL	HEMA- TOCRIT %	MCH PG	MCHC G/DL	MCV FL	RETICU- LOCYTES 10*9/L	PLATE- LETS 10*3/CMM	MPV FL	LEUKO- CYTES 10*3/CMM	LYMPHO- CYTES 10*3/CMM	MONO- CYTES 10*3/CMM
GROUP 2 :100 PPM												
3851 F	7.76	15.5	42.9	20.0	36.1	55.3	179.4	1047	7.6	7.68	6.69	0.16
3852 F	7.63	14.8	42.7	19.4	34.7	55.9	111.5	1147	7.8	8.51	6.70	0.38
3853 F	7.44	14.3	40.1	19.2	35.7	53.9	213.1	1205	7.8	6.54	5.71	0.12
3854 F	7.53	14.8	41.1	19.7	36.1	54.6	152.1	1126	8.1	10.78	8.16	0.32
3855 F	7.17	15.1	41.7	21.0	36.1	58.1	149.6	932	7.6	5.04	4.35	0.15
3856 F	7.30	14.3	41.6	19.6	34.5	56.9	163.2	1212	8.2	12.07	7.70	0.35
3857 F	7.45	14.9	42.6	20.1	35.0	57.3	166.3	1267	7.9	5.90	5.04	0.11
3858 F	7.89	14.9	42.2	18.9	35.3	53.5	159.2	1090	8.3	3.90	3.02	0.07
3859 F	7.43	14.9	41.7	20.1	35.8	56.1	121.5	985	8.2	5.96	4.41	0.10
3860 F	7.39	14.7	40.9	19.9	36.0	55.4	140.4	1076	8.5	9.55	7.79	0.22
MEAN	7.50	14.8	41.8	19.8	35.5	55.7	155.6	1109	8.0	7.59	5.96	0.20
S.D.	0.213	0.35	0.88	0.58	0.61	1.47	28.76	104.6	0.31	2.618	1.727	0.113
N	10	10	10	10	10	10	10	10	10	10	10	10

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ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL HEMATOLOGY DATA

DAY	91	FEMALES										
ANIMAL#	ERYTHRO- CYTES 10*6/CMM	HEMO- GLOBIN G/DL	HEMA- TOCRIT %	MCH PG	MCHC G/DL	MCV FL	RETICU- LOCYTES 10*9/L	PLATE- LETS 10*3/CMM	MPV FL	LEUKO- CYTES 10*3/CMM	LYMPHO- CYTES 10*3/CMM	MONO- CYTES 10*3/CMM
GROUP 3 :500 PPM												
3926 F	7.50	15.1	41.7	20.2	36.3	55.6	151.3	1242	8.3	6.43	5.26	0.12
3927 F	7.96	15.1	42.5	19.0	35.5	53.4	115.9	1037	7.8	9.53	8.29	0.23
3928 F	7.48	14.3	39.2	19.1	36.4	52.4	143.3	1334	7.5	7.12	5.77	0.16
3929 F	7.89	14.8	42.6	18.7	34.7	54.0	190.0	1078	7.7	6.17	5.53	0.14
3930 F	7.26	14.7	42.3	20.3	34.9	58.3	251.7	1044	8.0	6.24	5.37	0.12
3931 F	7.52	14.4	40.1	19.1	35.7	53.4	179.6	1059	9.0	6.84	5.43	0.13
3932 F	7.97	15.7	44.0	19.7	35.7	55.2	171.7	968	8.4	8.63	7.59	0.16
3933 F	8.08	15.1	44.1	18.6	34.2	54.6	165.9	986	8.3	4.97	3.84	0.11
3934 F	7.95	16.0	44.0	20.1	36.3	55.4	180.2	974	8.6	6.13	4.79	0.10
3935 F	7.76	15.7	44.1	20.2	35.6	56.8	187.8	1206	8.0	7.49	6.32	0.12
MEAN	7.74	15.1	42.5	19.5	35.5	54.9	173.7	1093	8.2	6.95	5.82	0.14
S.D.	0.276	0.57	1.73	0.67	0.73	1.75	35.68	125.3	0.45	1.324	1.300	0.038
N	10	10	10	10	10	10	10	10	10	10	10	10

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ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL HEMATOLOGY DATA

DAY	91	FEMALES										
ANIMAL#	ERYTHRO- CYTES 10*6/CMM	HEMO- GLOBIN G/DL	HEMA- TOCRIT %	MCH PG	MCHC G/DL	MCV FL	RETICU- LOCYTES 10*9/L	PLATE- LETS 10*3/CMM	MPV FL	LEUKO- CYTES 10*3/CMM	LYMPHO- CYTES 10*3/CMM	MONO- CYTES 10*3/CMM
GROUP 4 :5000 PPM												
3951 F	7.05	14.1	41.0	20.0	34.4	58.2	190.3	1249	7.8	5.74	4.44	0.13
3952 F	8.66	15.4	42.6	17.8	36.2	49.2	131.7	1097	7.7	10.99	9.62	0.20
3953 F	8.20	16.0	45.3	19.5	35.4	55.2	212.8	1264	8.2	6.27	4.97	0.08
3954 F	7.32	13.9	39.8	19.0	35.0	54.3	173.3	1036	8.9	6.99	5.56	0.17
3955 F	7.67	14.9	42.3	19.4	35.2	55.1	158.9	1194	8.8	6.83	5.84	0.14
3956 F	7.70	15.0	43.1	19.5	34.8	56.0	167.5	1180	8.5	4.86	4.30	0.08
3957 F	8.23	16.1	43.6	19.6	36.9	53.0	158.0	916	8.8	5.86	4.90	0.13
3958 F	8.30	16.2	45.8	19.5	35.3	55.2	146.4	1104	8.3	3.70	2.76	0.12
3959 F	7.42	14.9	40.6	20.1	36.7	54.7	156.2	1000	8.0	12.78	11.47	0.22
3960 F	7.94	14.9	43.7	18.8	34.0	55.1	151.1	1358	8.8	7.30	6.52	0.07
MEAN	7.85	15.1	42.8	19.3	35.4	54.6	164.6	1140	8.4	7.13	6.04	0.13
S.D.	0.505	0.79	1.95	0.66	0.95	2.31	23.12	134.6	0.45	2.752	2.616	0.051
N	10	10	10	10	10	10	10	10	10	10	10	10

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ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL HEMATOLOGY DATA

DAY	91	FEMALES										
ANIMAL#	ERYTHRO- CYTES 10*6/CMM	HEMO- GLOBIN G/DL	HEMA- TOCRIT %	MCH PG	MCHC G/DL	MCV FL	RETICU- LOCYTES 10*9/L	PLATE- LETS 10*3/CMM	MPV FL	LEUKO- CYTES 10*3/CMM	LYMPHO- CYTES 10*3/CMM	MONO- CYTES 10*3/CMM
GROUP 5 :10000 PPM												
3876 F	8.30	14.8	41.1	17.8	35.9	49.5	121.0	1170	8.4	7.88	6.89	0.27
3877 F	8.00	15.4	42.9	19.3	36.0	53.6	176.4	944	8.7	11.30	9.55	0.47
3878 F	7.42	13.7	39.5	18.5	34.7	53.3	129.8	859	8.5	4.38	3.68	0.07
3879 F	7.70	14.6	41.0	18.9	35.5	53.2	193.6	983	8.8	11.10	10.35	0.09
3880 F	7.16	14.2	38.8	19.8	36.6	54.2	176.9	1028	8.6	13.41	11.90	0.18
3881 F	7.47	13.8	39.4	18.4	35.0	52.7	113.8	1129	8.7	4.79	4.05	0.10
3882 F	7.66	14.7	41.7	19.1	35.2	54.4	125.9	1139	8.3	9.29	7.95	0.24
3883 F	7.53	14.7	39.8	19.5	37.0	52.8	134.7	841	8.6	4.52	3.82	0.16
3884 F	8.01	15.3	43.1	19.1	35.5	53.8	173.8	677	10.3	8.69	7.14	0.10
3885 F	8.66	15.6	44.4	18.0	35.1	51.2	158.1	977	8.3	9.26	7.12	0.18
MEAN	7.79	14.7	41.2	18.8	35.7	52.9	150.4	975	8.7	8.46	7.24	0.19
S.D.	0.452	0.64	1.85	0.65	0.73	1.49	28.53	153.7	0.58	3.107	2.827	0.120
N	10	10	10	10	10	10	10	10	10	10	10	10

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ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL HEMATOLOGY DATA

DAY 91 FEMALES

ANIMAL#	SEGD NEUTRO- PHILS 10*3/CMM	EOSINO- PHILS 10*3/CMM	BASO- PHILS 10*3/CMM	LG UNSTAIN CELL 10*3/CMM
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GROUP 1 :0 PPM

3901 F	2.58	0.32	0.02	0.030
3902 F	CS	CS	CS	CS
3903 F	0.88	0.17	0.02	0.040
3904 F	0.46	0.11	0.03	0.160
3905 F	0.61	0.04	0.02	0.040
3906 F	0.40	0.05	0.01	0.030
3907 F	0.64	0.10	0.01	0.020
3908 F	0.58	0.05	0.01	0.020
3909 F	0.85	0.14	0.02	0.030
3910 F	0.89	0.13	0.02	0.040
MEAN	0.88	0.12	0.02	0.046
S.D.	0.663	0.086	0.007	0.0436
N	9	9	9	9

CS=CLOTTED SAMPLE

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APPENDIX 1

ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL HEMATOLOGY DATA

DAY 91 FEMALES

ANIMAL#	SEGD NEUTRO- PHILS 10*3/CMM	EOSINO- PHILS 10*3/CMM	BASO- PHILS 10*3/CMM	LG UNSTAIN CELL 10*3/CMM
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GROUP 2 :100 PPM

3851 F	0.63	0.11	0.01	0.070
3852 F	1.17	0.12	0.02	0.120
3853 F	0.58	0.08	0.01	0.040
3854 F	2.06	0.13	0.03	0.080
3855 F	0.40	0.09	0.01	0.050
3856 F	3.73	0.16	0.04	0.090
3857 F	0.58	0.12	0.00	0.050
3858 F	0.72	0.07	0.01	0.020
3859 F	1.32	0.09	0.01	0.030
3860 F	1.30	0.14	0.02	0.080
MEAN	1.25	0.11	0.02	0.063
S.D.	1.006	0.028	0.012	0.0306
N	10	10	10	10

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APPENDIX 1

ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL HEMATOLOGY DATA

DAY 91 FEMALES

ANIMAL#	SEGD NEUTRO- PHILS 10*3/CMM	EOSINO- PHILS 10*3/CMM	BASO- PHILS 10*3/CMM	LG UNSTAIN CELL 10*3/CMM
---------	--------------------------------------	------------------------------	----------------------------	-----------------------------------

GROUP 3 :500 PPM

3926 F	0.93	0.08	0.01	0.040
3927 F	0.81	0.12	0.03	0.060
3928 F	0.98	0.12	0.01	0.080
3929 F	0.40	0.05	0.01	0.040
3930 F	0.57	0.06	0.02	0.100
3931 F	1.15	0.09	0.01	0.030
3932 F	0.71	0.09	0.02	0.050
3933 F	0.88	0.09	0.01	0.030
3934 F	1.15	0.06	0.01	0.020
3935 F	0.91	0.07	0.02	0.050
MEAN	0.85	0.08	0.01	0.050
S.D.	0.238	0.024	0.007	0.0245
N	10	10	10	10

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APPENDIX 1

ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL HEMATOLOGY DATA

DAY 91 FEMALES

ANIMAL#	SEGD NEUTRO- PHILS 10*3/CMM	EOSINO- PHILS 10*3/CMM	BASO- PHILS 10*3/CMM	LG UNSTAIN CELL 10*3/CMM
---------	--------------------------------------	------------------------------	----------------------------	-----------------------------------

GROUP 4 :5000 PPM

3951 F	1.06	0.06	0.01	0.050
3952 F	0.94	0.11	0.04	0.080
3953 F	1.10	0.08	0.01	0.030
3954 F	1.05	0.16	0.01	0.040
3955 F	0.70	0.08	0.02	0.040
3956 F	0.41	0.04	0.01	0.020
3957 F	0.72	0.08	0.01	0.010
3958 F	0.75	0.05	0.01	0.010
3959 F	0.84	0.09	0.03	0.130
3960 F	0.56	0.11	0.01	0.040
MEAN	0.81	0.09	0.02	0.045
S.D.	0.228	0.035	0.011	0.0363
N	10	10	10	10

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ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL HEMATOLOGY DATA

DAY 91 FEMALES

ANIMAL#	SEGD NEUTRO- PHILS 10*3/CMM	EOSINO- PHILS 10*3/CMM	BASO- PHILS 10*3/CMM	LG UNSTAIN CELL 10*3/CMM
---------	--------------------------------------	------------------------------	----------------------------	-----------------------------------

GROUP 5 :10000 PPM

3876 F	0.52	0.09	0.02	0.090
3877 F	0.89	0.16	0.05	0.180
3878 F	0.55	0.04	0.01	0.020
3879 F	0.48	0.07	0.03	0.080
3880 F	1.03	0.10	0.03	0.170
3881 F	0.54	0.07	0.00	0.030
3882 F	0.90	0.12	0.03	0.060
3883 F	0.45	0.06	0.01	0.010
3884 F	1.02	0.38	0.02	0.030
3885 F	1.76	0.14	0.02	0.040
MEAN	0.81	0.12	0.02	0.071
S.D.	0.404	0.098	0.014	0.0605
N	10	10	10	10

Appendix 2
Individual Red Cell Morphology Data

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APPENDIX 2

ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL RED CELL MORPHOLOGY DATA

FEMALE GROUP 5 :10000 PPM

DAY 91

ANIMAL NO.	RBC MORPH- OLOGY	ANISO- CYTOSIS	POIKILO- CYTOSIS	POLY- CHROM- ASIA	SPHERO- CYTES	MACRO- CYTOSIS	MICRO- CYTOSIS	HYP0- CHRO- MASIA	MISCELLANEOUS AND PLATELET MORPHOLOGY
3884 F									PLTC
1+ = SLIGHT 2+ = MODERATE 3+ = MODERATE TO MARKED 4+ = MARKED PLTC=PLATELET CLUMPS									

Appendix 3
Individual Clinical Chemistry Data

Clinical Chemistry Explanation Page**Olympus AU640e**

Analyzed Parameter Descriptions

Parameter	Abbreviation	Units	Methodology
Albumin/Globulin Ratio	A/G Ratio	Ratio	Calculated
Albumin	--	g/dL	Dye binding-BCG
Alkaline Phosphatase	Alk Phos'tase	IU/L	Kinetic
Amylase	--	IU/L	Kinetic
Urea Nitrogen	--	mg/dL	Urease with GLDH
Calcium	--	mg/dL	Arsenazo III Dye
Chloride	--	mmol/L	Ion Selectivity
Cholesterol	--	mg/dL	Endpoint-Cholesterol Esterase
Creatine Kinase	--	IU/L	Kinetic
Creatinine	--	mg/dL	Kinetic-Alk. Picrate
Direct Bilirubin	--	mg/dL	Diazonium Salt/Ion w/BL
Gamma-glutamyltransferase	GGT, serum	IU/L	Kinetic
Indirect Bilirubin	Indir. bilirubin	mg/dL	Calculated
Globulin	--	g/dL	Calculated
Glucose	--	mg/dL	Hexokinase, UV
Aspartate Aminotransferase	AST	IU/L	Kinetic
Alanine Aminotransferase	ALT	IU/L	Kinetic
Sorbitol Dehydrogenase	--	IU/L	Oxidation Reduction Reaction
Iron	--	Ug/dL	TPZ without PPR
Potassium	--	mmol/L	Ion Selectivity
LDL Cholesterol	--	mg/dL	Calculated
Magnesium	--	mg/dL	Color-Dye-Xylidyl Mago
Sodium	--	mmol/L	Ion Selectivity
Bile Acids	BA	mm/L	Endpoint
Phosphorus	--	mg/dL	Endpoint
Total Bilirubin	--	mg/dL	Diazonium Salt/Ion w/BL
Total Protein	--	g/dL	Biuret
Lipase	--	U/L	Kinetic
Lactate Dehydrogenase	--	IU/L	Kinetic
Triglycerides	--	mg/dL	Enz Color without GB with SB
Uric Acid	--	mg/dL	Uricase
HDL Cholesterol	--	mg/dL	Endpoint-Cholesterol Esterase

Other Abbreviations

Abbreviation	Description	Abbreviation	Description
N/A	Not applicable	QNS	Quantity not sufficient for analysis
N	Number of observations	g/dL	Grams per deciliter
S.D.	Standard deviation		

Note: This is a comprehensive list of parameters and abbreviations. All of the parameters and abbreviations listed may not be applicable to this report.

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APPENDIX 3

ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL CLINICAL CHEMISTRY DATA

DAY 91 MALES

ANIMAL#	AST IU/L	ALT IU/L	ALK PHOS 'TASE IU/L	GGT, SERUM IU/L	TOTAL BILI- RUBIN MG/DL	CHOLE- STEROL MG/DL	TRIGLY- CERIDE MG/DL	TOTAL PROTEIN G/DL	ALBUMIN G/DL	GLOB- ULIN G/DL	A/G RATIO	GLUCOSE MG/DL
GROUP 1 :0 PPM												
3776 M	110	27	133	0.00	0.14	51	37	6.19	3.20	2.99	1.07	140
3777 M a	176	28	108	0.00	0.20	109	204	6.31	3.25	3.06	1.06	161
3778 M	99	26	84	0.00	0.10	54	62	4.77	2.62	2.15	1.22	196
3779 M	124	38	84	0.00	0.13	62	78	5.69	3.00	2.69	1.12	143
3780 M a	86	23	85	0.00	0.17	60	51	6.28	3.13	3.15	0.99	168
3781 M	186	88	61	0.00	0.13	54	72	5.49	3.15	2.34	1.35	117
3782 M	139	25	138	0.00	0.12	58	56	5.70	2.85	2.85	1.00	113
3783 M	88	19	49	0.00	0.15	51	42	5.47	2.90	2.57	1.13	111
3784 M a	110	23	111	0.00	0.17	75	59	5.66	2.84	2.82	1.01	124
3785 M a	69	26	96	0.00	0.15	61	62	6.23	3.18	3.05	1.04	132
MEAN	119	32	95	0.00	0.15	64	72	5.78	3.01	2.77	1.10	141
S.D.	38.4	20.2	28.5	0.000	0.029	17.5	47.9	0.487	0.204	0.330	0.113	27.5
N	10	10	10	10	10	10	10	10	10	10	10	10

a MINIMALLY HEMOLYZED.

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APPENDIX 3

ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL CLINICAL CHEMISTRY DATA

DAY	91	MALES											
ANIMAL#		AST IU/L	ALT IU/L	ALK PHOS 'TASE IU/L	GGT, SERUM IU/L	TOTAL BILI- RUBIN MG/DL	CHOLE- STEROL MG/DL	TRIGLY- CERIDE MG/DL	TOTAL PROTEIN G/DL	ALBUMIN G/DL	GLOB- ULIN G/DL	A/G RATIO	GLUCOSE MG/DL
GROUP 2 :100 PPM													
3726	M a	130	27	66	0.00	0.20	48	39	5.41	3.00	2.41	1.24	141
3727	M b	133	30	75	0.00	0.14	52	62	5.70	2.99	2.71	1.10	146
3728	M a	156	50	92	0.00	0.22	84	45	6.28	3.00	3.28	0.91	135
3729	M b	96	23	55	0.00	0.15	78	40	5.53	2.76	2.77	1.00	139
3730	M b	85	21	62	0.00	0.13	40	30	5.79	2.89	2.90	1.00	116
3731	M b	130	32	65	0.00	0.14	59	60	5.62	2.99	2.63	1.14	119
3732	M	92	29	78	0.00	0.11	45	38	5.87	2.93	2.94	1.00	109
3733	M	86	22	46	0.00	0.11	53	47	5.49	3.02	2.47	1.22	80
3734	M	91	24	83	0.00	0.14	70	85	6.00	3.13	2.87	1.09	114
3735	M	103	28	95	0.00	0.18	58	46	5.93	3.15	2.78	1.13	118
MEAN		110	29	72	0.00	0.15	59	49	5.76	2.99	2.78	1.08	122
S.D.		24.9	8.4	15.8	0.000	0.037	14.4	15.9	0.267	0.112	0.249	0.105	19.6
N		10	10	10	10	10	10	10	10	10	10	10	10

a MILDLY HEMOLYZED.

b MINIMALLY HEMOLYZED.

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ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL CLINICAL CHEMISTRY DATA

DAY 91 MALES

ANIMAL#	AST IU/L	ALT IU/L	ALK PHOS 'TASE IU/L	GGT, SERUM IU/L	TOTAL BILI- RUBIN MG/DL	CHOLE- STEROL MG/DL	TRIGLY- CERIDE MG/DL	TOTAL PROTEIN G/DL	ALBUMIN G/DL	GLOB- ULIN G/DL	A/G RATIO	GLUCOSE MG/DL
GROUP 3 :500 PPM												
3801 M	122	28	82	0.00	0.16	51	40	5.81	2.98	2.83	1.05	120
3802 M	193	37	79	0.00	0.13	57	54	5.62	2.91	2.71	1.07	124
3803 M a	118	23	70	0.00	0.18	95	80	6.08	3.17	2.91	1.09	139
3804 M	117	25	71	0.00	0.19	77	81	5.51	2.94	2.57	1.14	143
3805 M	83	29	81	0.00	0.14	66	65	6.20	3.05	3.15	0.97	136
12250 M	120	24	82	0.00	0.13	69	51	5.79	3.10	2.69	1.15	121
3807 M	112	24	136	0.00	0.12	44	56	5.68	2.85	2.83	1.01	122
3808 M	93	28	84	0.00	0.16	58	48	5.96	2.98	2.98	1.00	133
3809 M	79	22	72	0.00	0.14	56	44	5.85	3.12	2.73	1.14	126
3810 M	55	26	109	0.00	0.12	67	56	6.27	3.26	3.01	1.08	160
MEAN	109	27	87	0.00	0.15	64	58	5.88	3.04	2.84	1.07	132
S.D.	36.9	4.3	20.6	0.000	0.025	14.5	14.0	0.249	0.127	0.175	0.063	12.6
N	10	10	10	10	10	10	10	10	10	10	10	10

a MINIMALLY HEMOLYZED.

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APPENDIX 3

ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL CLINICAL CHEMISTRY DATA

DAY	91	MALES										
ANIMAL#	AST IU/L	ALT IU/L	ALK PHOS 'TASE IU/L	GGT, SERUM IU/L	TOTAL BILI- RUBIN MG/DL	CHOLE- STEROL MG/DL	TRIGLY- CERIDE MG/DL	TOTAL PROTEIN G/DL	ALBUMIN G/DL	GLOB- ULIN G/DL	A/G RATIO	GLUCOSE MG/DL
GROUP 4 :5000 PPM												
3751 M	75	16	43	0.00	0.15	133	74	6.36	3.13	3.23	0.97	135
3752 M	92	23	55	0.00	0.15	92	60	6.54	3.32	3.22	1.03	143
3753 M	85	28	78	0.03	0.12	92	62	6.13	3.27	2.86	1.14	144
3754 M	78	21	55	0.00	0.15	125	81	6.96	3.57	3.39	1.05	165
3755 M	87	23	82	0.00	0.20	96	43	5.90	3.07	2.83	1.08	172
3756 M	91	20	63	0.00	0.17	83	83	6.65	3.42	3.23	1.06	146
3757 M	106	22	94	0.00	0.14	72	55	6.11	3.18	2.93	1.09	130
3758 M	97	29	102	0.00	0.10	76	88	5.74	3.00	2.74	1.09	142
3759 M	57	21	80	0.00	0.13	92	62	6.39	3.10	3.29	0.94	151
3760 M	74	28	67	0.00	0.10	99	48	5.97	3.06	2.91	1.05	142
MEAN	84	23	72	0.00	0.14	96	66	6.28	3.21	3.06	1.05	147
S.D.	13.8	4.1	18.6	0.009	0.031	19.5	15.3	0.375	0.181	0.231	0.059	12.8
N	10	10	10	10	10	10	10	10	10	10	10	10

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ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL CLINICAL CHEMISTRY DATA

DAY	91	MALES										
ANIMAL#	AST IU/L	ALT IU/L	ALK PHOS 'TASE IU/L	GGT, SERUM IU/L	TOTAL BILI- RUBIN MG/DL	CHOLE- STEROL MG/DL	TRIGLY- CERIDE MG/DL	TOTAL PROTEIN G/DL	ALBUMIN G/DL	GLOB- ULIN G/DL	A/G RATIO	GLUCOSE MG/DL
GROUP 5 :10000 PPM												
3701 M	91	14	49	0.91	0.14	86	33	6.29	3.20	3.09	1.04	140
18077 M a	93	27	63	0.82	0.15	131	68	6.54	3.33	3.21	1.04	166
3703 M	76	22	69	2.02	0.18	130	50	6.15	2.96	3.19	0.93	160
3704 M	83	21	55	2.31	0.14	103	42	5.50	2.96	2.54	1.17	177
3705 M a	45	19	61	1.02	0.14	92	65	6.24	3.29	2.95	1.12	167
3706 M	77	21	53	2.40	0.13	166	113	6.79	3.47	3.32	1.05	145
3707 M	122	38	78	7.38	0.17	134	71	6.39	3.26	3.13	1.04	126
3708 M a	93	23	55	0.26	0.14	62	54	6.27	3.19	3.08	1.04	154
3709 M	88	38	85	1.66	0.14	136	43	6.53	3.23	3.30	0.98	133
3710 M	59	20	93	3.22	0.19	137	194	6.47	3.21	3.26	0.98	163
MEAN	83	24	66	2.20	0.15	118	73	6.32	3.21	3.11	1.04	153
S.D.	20.9	7.9	14.8	2.027	0.020	30.9	47.9	0.342	0.155	0.229	0.069	16.5
N	10	10	10	10	10	10	10	10	10	10	10	10

a MINIMALLY HEMOLYZED.

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ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL CLINICAL CHEMISTRY DATA

DAY	91	MALES					
ANIMAL#	UREA NITROGEN MG/DL	CREA- TININE MG/DL	CALCIUM MG/DL	PHOS- PHORUS MG/DL	SODIUM MMOL/L	POTAS- SIUM MMOL/L	CHLO- RIDE MMOL/L
GROUP 1 :0 PPM							
3776 M	12	0.25	10.43	6.58	142	5.08	102
3777 M a	14	0.27	10.42	8.03	138	5.54	99
3778 M	39	0.43	9.58	7.47	143	4.39	102
3779 M	14	0.30	9.83	7.14	141	4.94	103
3780 M a	10	0.28	9.72	5.92	142	4.97	103
3781 M	11	0.36	9.59	5.15	144	4.56	106
3782 M	14	0.34	9.55	5.97	144	4.80	104
3783 M	12	0.31	9.63	5.75	143	4.50	105
3784 M a	14	0.34	9.71	7.02	144	4.72	104
3785 M a	10	0.24	10.27	6.68	141	5.10	105
MEAN	15	0.31	9.87	6.57	142	4.86	103
S.D.	8.6	0.058	0.357	0.879	1.9	0.342	2.0
N	10	10	10	10	10	10	10

a MINIMALLY HEMOLYZED.

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APPENDIX 3

ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL CLINICAL CHEMISTRY DATA

DAY	91	MALES						
ANIMAL#		UREA NITROGEN MG/DL	CREA- TININE MG/DL	CALCIUM MG/DL	PHOS- PHORUS MG/DL	SODIUM MMOL /L	POTAS- SIUM MMOL /L	CHLO- RIDE MMOL /L
GROUP 2 :100 PPM								
3726	M a	9	0.23	9.79	6.37	142	5.10	106
3727	M b	14	0.26	9.77	6.13	141	4.83	104
3728	M a	13	0.27	10.27	7.41	141	5.44	102
3729	M b	9	0.29	9.74	6.20	142	4.75	104
3730	M b	11	0.28	9.72	6.46	143	4.86	106
3731	M b	13	0.29	9.53	6.90	144	4.68	104
3732	M	14	0.35	9.31	6.65	143	4.28	105
3733	M	11	0.30	9.86	6.45	144	4.64	106
3734	M	15	0.30	10.16	7.14	143	5.06	104
3735	M	10	0.28	10.08	6.80	142	4.74	103
MEAN		12	0.28	9.82	6.65	143	4.84	104
S.D.		2.2	0.031	0.289	0.412	1.1	0.312	1.3
N		10	10	10	10	10	10	10

a MILDLY HEMOLYZED.

b MINIMALLY HEMOLYZED.

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ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL CLINICAL CHEMISTRY DATA

DAY	91	MALES					
ANIMAL#	UREA NITROGEN MG/DL	CREA- TININE MG/DL	CALCIUM MG/DL	PHOS- PHORUS MG/DL	SODIUM MMOL/L	POTAS- SIUM MMOL/L	CHLO- RIDE MMOL/L
GROUP 3 :500 PPM							
3801 M	11	0.26	10.08	7.19	143	5.49	103
3802 M	14	0.36	9.52	6.64	142	4.76	104
3803 M a	10	0.29	10.23	6.87	141	5.44	102
3804 M	9	0.27	10.03	7.01	142	5.06	104
3805 M	12	0.27	10.36	6.66	142	4.67	103
12250 M	13	0.32	9.84	6.71	143	4.75	106
3807 M	12	0.31	9.91	7.27	143	4.75	105
3808 M	11	0.28	10.12	6.67	141	4.96	103
3809 M	10	0.32	9.69	6.99	144	4.98	105
3810 M	11	0.27	10.66	7.11	143	4.64	105
MEAN	11	0.30	10.04	6.91	142	4.95	104
S.D.	1.5	0.032	0.330	0.235	1.0	0.305	1.2
N	10	10	10	10	10	10	10

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APPENDIX 3

ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL CLINICAL CHEMISTRY DATA

DAY	91	MALES					
ANIMAL#	UREA NITROGEN MG/DL	CREA- TININE MG/DL	CALCIUM MG/DL	PHOS- PHORUS MG/DL	SODIUM MMOL/L	POTAS- SIUM MMOL/L	CHLO- RIDE MMOL/L
GROUP 4 :5000 PPM							
3751 M	11	0.26	10.00	6.61	142	5.16	103
3752 M	11	0.31	10.16	6.42	142	5.17	103
3753 M	11	0.27	9.95	6.41	143	4.95	104
3754 M	10	0.28	10.64	6.49	142	5.27	103
3755 M	11	0.30	9.90	6.42	143	5.08	106
3756 M	11	0.26	10.12	6.89	141	5.18	101
3757 M	10	0.25	10.14	6.89	142	4.71	104
3758 M	11	0.27	9.80	6.92	142	4.88	104
3759 M	10	0.31	10.12	6.83	143	5.03	105
3760 M	10	0.26	10.24	6.92	143	4.72	105
MEAN	11	0.28	10.11	6.68	142	5.01	104
S.D.	0.5	0.022	0.231	0.230	0.7	0.196	1.4
N	10	10	10	10	10	10	10

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ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL CLINICAL CHEMISTRY DATA

DAY	91	MALES					
ANIMAL#	UREA NITROGEN MG/DL	CREA- TININE MG/DL	CALCIUM MG/DL	PHOS- PHORUS MG/DL	SODIUM MMOL/L	POTAS- SIUM MMOL/L	CHLO- RIDE MMOL/L
GROUP 5 :10000 PPM							
3701 M	12	0.24	9.95	6.59	144	5.05	105
18077 M a	9	0.26	10.18	6.34	142	5.44	103
3703 M	13	0.26	9.85	6.83	144	4.83	107
3704 M	11	0.23	9.85	6.02	141	5.13	106
3705 M a	10	0.21	10.30	5.98	142	4.45	104
3706 M	13	0.25	10.32	6.91	142	5.52	103
3707 M	10	0.26	9.90	6.81	143	5.01	104
3708 M a	13	0.27	10.08	6.75	143	5.09	105
3709 M	10	0.29	10.08	7.26	143	5.10	104
3710 M	12	0.26	10.37	7.28	142	5.08	104
MEAN	11	0.25	10.09	6.68	143	5.07	105
S.D.	1.5	0.022	0.198	0.452	1.0	0.296	1.3
N	10	10	10	10	10	10	10

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APPENDIX 3

ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL CLINICAL CHEMISTRY DATA

DAY 91 FEMALES

ANIMAL#	AST IU/L	ALT IU/L	ALK PHOS 'TASE IU/L	GGT, SERUM IU/L	TOTAL BILI- RUBIN MG/DL	CHOLE- STEROL MG/DL	TRIGLY- CERIDE MG/DL	TOTAL PROTEIN G/DL	ALBUMIN G/DL	GLOB- ULIN G/DL	A/G RATIO	GLUCOSE MG/DL
GROUP 1 :0 PPM												
3901 F	368	162	43	0.51	0.17	98	49	7.03	3.90	3.13	1.25	132
3902 F a	142	32	59	0.06	0.19	73	49	5.73	3.23	2.50	1.29	122
3903 F	90	24	83	0.03	0.14	48	26	6.30	3.53	2.77	1.27	119
3904 F	73	25	41	0.25	0.13	108	50	6.28	3.58	2.70	1.33	135
3905 F	82	23	41	0.00	0.14	62	37	6.12	3.43	2.69	1.28	115
3906 F	103	21	43	0.00	0.15	78	74	6.41	3.45	2.96	1.17	167
3907 F	78	24	70	0.00	0.16	74	77	6.89	3.77	3.12	1.21	147
3908 F	72	20	45	0.08	0.10	58	39	5.92	3.25	2.67	1.22	140
3909 F	113	38	106	0.15	0.11	54	51	6.15	3.21	2.94	1.09	140
3910 F	63	20	79	0.00	0.12	56	40	5.88	3.19	2.69	1.19	136
MEAN	118	39	61	0.11	0.14	71	49	6.27	3.45	2.82	1.23	135
S.D.	90.8	43.6	22.7	0.163	0.028	19.6	15.9	0.420	0.245	0.210	0.069	15.1
N	10	10	10	10	10	10	10	10	10	10	10	10

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ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL CLINICAL CHEMISTRY DATA

DAY 91 FEMALES

ANIMAL#	AST IU/L	ALT IU/L	ALK PHOS 'TASE IU/L	GGT, SERUM IU/L	TOTAL BILI- RUBIN MG/DL	CHOLE- STEROL MG/DL	TRIGLY- CERIDE MG/DL	TOTAL PROTEIN G/DL	ALBUMIN G/DL	GLOB- ULIN G/DL	A/G RATIO	GLUCOSE MG/DL
GROUP 2 :100 PPM												
3851 F	127	25	33	0.03	0.16	70	42	6.15	3.60	2.55	1.41	130
3852 F a	113	30	48	0.55	0.22	93	48	6.17	3.41	2.76	1.24	127
3853 F	102	18	123	0.14	0.16	64	41	6.25	3.49	2.76	1.26	168
3854 F	116	24	44	0.00	0.14	109	43	6.13	3.16	2.97	1.06	106
3855 F	91	44	52	0.00	0.14	66	47	5.88	3.40	2.48	1.37	148
3856 F	128	24	42	0.15	0.14	81	39	5.89	2.96	2.93	1.01	105
3857 F	108	33	67	0.45	0.17	66	35	6.18	3.53	2.65	1.33	147
3858 F	77	20	37	0.00	0.12	60	55	6.21	3.43	2.78	1.23	142
3859 F	95	25	59	0.00	0.11	68	33	6.23	3.23	3.00	1.08	122
3860 F	79	28	46	0.19	0.14	76	35	6.13	3.31	2.82	1.17	138
MEAN	104	27	55	0.15	0.15	75	42	6.12	3.35	2.77	1.22	133
S.D.	18.1	7.4	25.9	0.199	0.031	15.3	6.8	0.131	0.192	0.173	0.135	19.5
N	10	10	10	10	10	10	10	10	10	10	10	10

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ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL CLINICAL CHEMISTRY DATA

DAY	91	FEMALES										
ANIMAL#	AST IU/L	ALT IU/L	ALK PHOS 'TASE IU/L	GGT, SERUM IU/L	TOTAL BILI- RUBIN MG/DL	CHOLE- STEROL MG/DL	TRIGLY- CERIDE MG/DL	TOTAL PROTEIN G/DL	ALBUMIN G/DL	GLOB- ULIN G/DL	A/G RATIO	GLUCOSE MG/DL
GROUP 3 :500 PPM												
3926 F	81	18	69	0.00	0.14	71	34	6.66	3.70	2.96	1.25	158
3927 F a	127	34	42	0.05	0.16	60	58	6.06	3.36	2.70	1.24	138
3928 F a	100	35	36	0.80	0.18	62	39	5.77	3.07	2.70	1.14	124
3929 F	120	52	29	0.00	0.18	67	34	6.46	3.51	2.95	1.19	131
3930 F	89	19	48	0.00	0.20	79	52	6.60	3.81	2.79	1.37	137
3931 F	75	24	44	0.02	0.14	74	56	5.75	3.34	2.41	1.39	128
3932 F	112	28	48	0.21	0.13	68	62	6.13	3.43	2.70	1.27	127
3933 F b	99	21	34	0.00	0.14	73	40	6.33	3.54	2.79	1.27	136
3934 F	96	15	52	0.00	0.12	79	39	6.37	3.40	2.97	1.14	117
3935 F	80	22	27	0.00	0.17	102	84	7.24	4.19	3.05	1.37	141
MEAN	98	27	43	0.11	0.16	74	50	6.34	3.54	2.80	1.26	134
S.D.	17.5	11.0	12.4	0.252	0.026	11.9	15.8	0.446	0.307	0.189	0.092	11.2
N	10	10	10	10	10	10	10	10	10	10	10	10

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ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL CLINICAL CHEMISTRY DATA

DAY	91	FEMALES										
ANIMAL#	AST IU/L	ALT IU/L	ALK PHOS 'TASE IU/L	GGT, SERUM IU/L	TOTAL BILI- RUBIN MG/DL	CHOLE- STEROL MG/DL	TRIGLY- CERIDE MG/DL	TOTAL PROTEIN G/DL	ALBUMIN G/DL	GLOB- ULIN G/DL	A/G RATIO	GLUCOSE MG/DL
GROUP 4 :5000 PPM												
3951 F	88	14	64	0.00	0.14	91	37	6.65	3.44	3.21	1.07	135
3952 F a	127	30	50	1.40	0.19	93	63	6.34	3.59	2.75	1.31	130
3953 F	97	31	34	0.33	0.14	71	41	6.70	3.76	2.94	1.28	152
3954 F	115	38	57	0.82	0.16	133	67	5.88	3.37	2.51	1.34	212
3955 F	114	26	40	0.73	0.16	76	38	5.91	3.29	2.62	1.26	137
3956 F	108	29	68	0.48	0.16	113	55	7.17	3.95	3.22	1.23	141
3957 F	83	28	65	0.53	0.13	83	61	6.37	3.55	2.82	1.26	135
3958 F	84	13	39	0.22	0.14	38	53	6.23	3.54	2.69	1.32	139
3959 F	72	15	34	0.45	0.16	81	38	5.64	3.27	2.37	1.38	146
3960 F	67	16	35	0.50	0.13	99	46	6.96	3.68	3.28	1.12	151
MEAN	96	24	49	0.55	0.15	88	50	6.39	3.54	2.84	1.26	148
S.D.	20.0	8.8	13.9	0.381	0.019	25.4	11.4	0.492	0.214	0.315	0.097	23.7
N	10	10	10	10	10	10	10	10	10	10	10	10

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ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL CLINICAL CHEMISTRY DATA

DAY	91	FEMALES										
ANIMAL#	AST IU/L	ALT IU/L	ALK PHOS 'TASE IU/L	GGT, SERUM IU/L	TOTAL BILI- RUBIN MG/DL	CHOLE- STEROL MG/DL	TRIGLY- CERIDE MG/DL	TOTAL PROTEIN G/DL	ALBUMIN G/DL	GLOB- ULIN G/DL	A/G RATIO	GLUCOSE MG/DL
GROUP 5 :10000 PPM												
3876 F	90	18	44	0.27	0.14	130	40	6.76	3.66	3.10	1.18	145
3877 F	83	27	22	0.78	0.15	106	49	6.37	3.48	2.89	1.20	160
3878 F	72	14	39	1.28	0.13	126	39	6.16	3.49	2.67	1.31	177
3879 F	67	16	27	1.23	0.12	99	36	6.23	3.41	2.82	1.21	151
3880 F	85	30	51	0.03	0.13	150	37	6.66	3.66	3.00	1.22	153
3881 F	72	24	29	0.05	0.11	144	49	7.22	3.95	3.27	1.21	145
3882 F	81	17	30	1.19	0.14	94	36	6.57	3.50	3.07	1.14	131
3883 F	111	41	38	2.77	0.14	147	59	6.79	3.81	2.98	1.28	149
3884 F	62	20	35	0.49	0.14	103	46	6.56	3.55	3.01	1.18	142
3885 F	43	12	36	0.57	0.14	94	52	6.43	3.58	2.85	1.26	137
MEAN	77	22	35	0.87	0.13	119	44	6.57	3.61	2.97	1.22	149
S.D.	18.2	8.8	8.5	0.816	0.012	22.6	7.9	0.309	0.166	0.168	0.051	12.8
N	10	10	10	10	10	10	10	10	10	10	10	10

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ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL CLINICAL CHEMISTRY DATA

DAY	91	FEMALES					
ANIMAL#	UREA NITROGEN MG/DL	CREA- TININE MG/DL	CALCIUM MG/DL	PHOS- PHORUS MG/DL	SODIUM MMOL/L	POTAS- SIUM MMOL/L	CHLO- RIDE MMOL/L
GROUP 1 :0 PPM							
3901 F	11	0.33	10.78	6.04	142	4.24	104
3902 F a	13	0.34	9.93	6.35	142	4.78	108
3903 F	12	0.32	10.23	6.03	141	4.17	104
3904 F	13	0.38	10.15	6.25	144	3.82	107
3905 F	12	0.38	10.26	6.48	144	3.74	105
3906 F	9	0.35	10.29	5.31	142	4.45	105
3907 F	14	0.40	10.66	5.06	144	4.09	106
3908 F	14	0.39	9.92	5.43	145	3.87	109
3909 F	15	0.39	9.84	4.33	144	3.99	109
3910 F	12	0.39	9.91	6.53	143	4.01	107
MEAN	13	0.37	10.20	5.78	143	4.12	106
S.D.	1.7	0.029	0.321	0.722	1.3	0.314	1.9
N	10	10	10	10	10	10	10

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ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL CLINICAL CHEMISTRY DATA

DAY	91	FEMALES					
ANIMAL#	UREA NITROGEN MG/DL	CREA- TININE MG/DL	CALCIUM MG/DL	PHOS- PHORUS MG/DL	SODIUM MMOL/L	POTAS- SIUM MMOL/L	CHLO- RIDE MMOL/L
GROUP 2 :100 PPM							
3851 F	13	0.40	9.99	5.47	144	4.12	106
3852 F a	15	0.43	9.98	6.58	143	3.88	105
3853 F	11	0.37	10.10	4.99	142	4.53	105
3854 F	15	0.43	10.12	6.52	142	4.43	105
3855 F	9	0.32	10.33	5.56	143	3.87	107
3856 F	14	0.33	9.72	5.78	141	4.62	105
3857 F	15	0.37	10.12	6.03	145	4.04	109
3858 F	13	0.34	10.17	6.70	144	4.06	108
3859 F	14	0.33	9.79	5.66	143	3.68	107
3860 F	12	0.35	10.47	6.60	141	4.38	106
MEAN	13	0.37	10.08	5.99	143	4.16	106
S.D.	2.0	0.041	0.226	0.588	1.3	0.314	1.4
N	10	10	10	10	10	10	10

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ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL CLINICAL CHEMISTRY DATA

DAY	91	FEMALES					
ANIMAL#	UREA NITROGEN MG/DL	CREA- TININE MG/DL	CALCIUM MG/DL	PHOS- PHORUS MG/DL	SODIUM MMOL/L	POTAS- SIUM MMOL/L	CHLO- RIDE MMOL/L
GROUP 3 :500 PPM							
3926 F	12	0.28	10.42	5.70	141	4.49	105
3927 F a	14	0.42	10.14	4.97	143	4.34	106
3928 F a	12	0.35	10.20	6.27	143	5.09	108
3929 F	11	0.31	10.53	6.03	144	4.39	106
3930 F	10	0.29	10.47	5.50	143	4.43	106
3931 F	14	0.41	9.98	5.82	142	4.11	107
3932 F	12	0.37	9.88	6.13	144	4.16	105
3933 F b	13	0.45	10.09	6.43	145	4.69	107
3934 F	13	0.30	10.39	6.46	146	4.37	105
3935 F	13	0.31	11.52	6.10	142	4.45	104
MEAN	12	0.35	10.36	5.94	143	4.45	106
S.D.	1.3	0.061	0.461	0.459	1.5	0.277	1.2
N	10	10	10	10	10	10	10

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ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL CLINICAL CHEMISTRY DATA

DAY	91	FEMALES					
ANIMAL#	UREA NITROGEN MG/DL	CREA- TININE MG/DL	CALCIUM MG/DL	PHOS- PHORUS MG/DL	SODIUM MMOL/L	POTAS- SIUM MMOL/L	CHLO- RIDE MMOL/L
GROUP 4 :5000 PPM							
3951 F	12	0.31	10.42	6.17	145	4.56	107
3952 F a	11	0.31	10.60	6.78	144	4.60	107
3953 F	11	0.31	10.58	5.85	145	4.47	106
3954 F	8	0.31	10.12	6.23	143	4.47	106
3955 F	13	0.37	10.09	6.40	145	4.34	107
3956 F	10	0.30	10.58	5.92	143	4.55	104
3957 F	10	0.34	10.27	6.13	143	4.56	105
3958 F	9	0.28	10.06	5.76	145	3.81	106
3959 F	8	0.25	9.98	6.36	142	4.48	105
3960 F	9	0.32	10.53	5.73	143	4.27	105
MEAN	10	0.31	10.32	6.13	144	4.41	106
S.D.	1.7	0.032	0.246	0.330	1.1	0.235	1.0
N	10	10	10	10	10	10	10

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ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY IN RATS

INDIVIDUAL CLINICAL CHEMISTRY DATA

DAY	91	FEMALES					
ANIMAL#	UREA NITROGEN MG/DL	CREA- TININE MG/DL	CALCIUM MG/DL	PHOS- PHORUS MG/DL	SODIUM MMOL/L	POTAS- SIUM MMOL/L	CHLO- RIDE MMOL/L
GROUP 5 :10000 PPM							
3876 F	16	0.30	10.31	6.31	144	4.66	105
3877 F	9	0.33	10.27	6.05	142	4.31	105
3878 F	12	0.31	10.05	5.19	143	4.81	107
3879 F	9	0.29	10.19	5.38	142	4.66	107
3880 F	10	0.28	10.71	5.65	142	4.05	102
3881 F	10	0.31	11.18	6.10	144	4.11	104
3882 F	11	0.28	10.36	6.12	143	4.37	106
3883 F	9	0.32	10.72	5.75	143	4.58	106
3884 F	9	0.27	10.26	5.60	142	4.61	105
3885 F	8	0.32	9.98	5.53	142	4.37	104
MEAN	10	0.30	10.40	5.77	143	4.45	105
S.D.	2.3	0.020	0.365	0.364	0.8	0.251	1.5
N	10	10	10	10	10	10	10

APPENDIX 8 - HISTOPATHOLOGICAL REPORT



FINAL REPORT

Study Phase: Pathology

Test Site Phase Reference No. 0020004833

Testing Facility Study No. TQC00066

Oral (Diet) Repeated Dose 90-Day Toxicity Study of Malathion Technical in Rats

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3. COMPLIANCE STATEMENT

The portion of this study performed by Charles River Laboratories, Pathology Associates - Illinois was conducted in compliance with the following Good Laboratory Practice (GLP) regulations:

- United States Environmental Protection Agency, Code of Federal Regulations, Title 40, Part 160/792; 1989: Federal Insecticide, Fungicide and Rodenticide Act/Toxic Substance Control Act.
- The Organisation for Economic Cooperation and Development (OECD) Principles on Good Laboratory Practice (C[97]186/Final).

This study was conducted in accordance with the procedures described herein. The report represents an accurate and complete record of the results obtained. There were no deviations from the above regulations that affected the overall integrity of the study or the interpretation of the study results and conclusions.



Date: 11-JAN-2012

Carol J. Detrisac, DVM, PhD, DACVP

Study Pathologist


Charles River Laboratories, Pathology Associates – Illinois

4. QUALITY ASSURANCE STATEMENT

This report has been inspected by the Pathology Associates' Quality Assurance Unit (QAU) as required by the Good Laboratory Practice (GLP) regulations promulgated by the Environmental Protection Agency (EPA) and the Organisation for Economic Cooperation and Development (OECD). The report is an accurate reflection of the recorded data. The following table is a record of the inspections/audits performed and reported by the QAU.

Dates Findings Submitted to:

<u>Dates of Inspection</u>	<u>Phase(s) Inspected</u>	<u>Study Pathologist and Pathology Associates Management</u>	<u>Study Director, Testing Facility Management, and Lead QAU</u>
13-May-2011	Tissue Trimming	17-May-2011	20-May-2011
17, 22-Jun-2011	Draft Pathology Report and Supporting Documentation	23-Jun-2011	30-Jun-2011
22, 28-Jun-2011	Individual Animal Data	28-Jun-2011	29-Dec-2011
27-Dec-2011	2 nd Draft Pathology Report and Supporting Documentation	27-Dec-2011	29-Dec-2011
10-Jan-2012	Final Pathology Report	10-Jan-2012	10-Jan-2012


Enosha Simmons
Senior Quality Assurance Auditor
Charles River Laboratories, Pathology Associates

11-Jan-2012
Date

5. RESPONSIBLE PERSONNEL

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6. INTRODUCTION

This report presents the pathology findings in rats assigned to the study entitled *Oral (Diet) Repeated Dose 90-Day Toxicity Study of Malathion Technical in Rats* (Study No. TQC00066). The objective of this study was to provide information on possible adverse effects on Crl:CD(SD) rats resulting from repeated exposure to Malathion Technical over an extended period of time covering post weaning maturation and growth well into adulthood. The study should provide information on toxicity, indicate target organs and the possibility of accumulation, and may provide an estimate of a no-observed-adverse-effect level (NOAEL) of exposure that can be used for establishing safety criteria for human exposure.

The study was sponsored by Cheminova A/S, Lemvig, Denmark, where M. Jensen served as the Sponsor representative. John F. Barnett, Jr., B.S., Charles River Laboratories, Preclinical Services, Horsham, Pennsylvania, served as the Study Director.

7. MATERIALS AND METHODS

Experimental procedures applicable to pathology investigations are summarized in [Text Table 1](#) and [Text Table 2](#). Deviations to the pathology procedures performed by Charles River Laboratories, Pathology Associates - Illinois are listed in [Appendix 1](#).

Text Table 1
Experimental Design

Dosage Group	No. of Rats		Test Material	Concentration (ppm)	Batch Number
	Male	Female			
I	10 ^a + 15 ^b	10 ^a + 15 ^b	Carrier Control	0	B-TQC00066-A
II	10 ^a + 15 ^b	10 ^a + 15 ^b	Malathion Technical	100	B-TQC00066-B
III	10 ^a + 15 ^b	10 ^a + 15 ^b	Malathion Technical	500	B-TQC00066-C
IV	10 ^a + 15 ^b	10 ^a + 15 ^b	Malathion Technical	5000	B-TQC00066-D
V	10 ^a + 15 ^b	10 ^a + 15 ^b	Malathion Technical	10000	B-TQC00066-E

^a The first 10 rats/sex/group were assigned to the main study.

^b The remaining 15 rats/sex/group were assigned to the cholinesterase subset.

All main study animals were submitted for necropsy on Day 91 (Schedule Sacrificed / Scheduled Euthanasia). Necropsies were performed and organ weights were collected by Testing Facility

personnel. Except as noted in [Text Table 2](#), tissues were collected in 10% neutral buffered formalin. Animals assigned to the cholinesterase subset were submitted for necropsy, but only the gross lesions were collected and retained.

Text Table 2
Tissue Collection and Examination

Provantis Tissue Term	Protocol Tissue Term	Weigh	Collect	Micro Eval	Comment
-	Animal identification	-	X	-	-
AORTA	Artery, aorta	-	X	X	From thoracic segment.
-	Bone marrow smear	-	X	X ^a	Two bone marrow smears per animal were collected from the sternum.
BONE MARROW, FEMUR	Bone marrow, femur	-	X	X	Collected with bone, femur
BONE, FEMUR	Bone, femur	-	X	X	Collected distal end to include femoral tibial joint
BONE, STERNUM	Bone, sternum	-	X	X	-
BRAIN	Brain	X	X	X	Forebrain, midbrain, cerebellum, and medulla oblongata.
CERVIX	Cervix	X	X	X	Collected and weighed with uterus.
EPIDIDYMIS	Epididymis	X	X	X	Paired weight and examination.
ESOPHAGUS	Esophagus	-	X	X	-
EYE	Eye	-	X	X	Paired examination; Preserved in Davidson's fixative.
ADRENAL GLAND	Gland, adrenal	X	X	X	Paired weight and examination.
HARDERIAN GLAND	Gland, harderian	-	X	X	Paired examination. Collected with eye (preserved in Davidson's fixative).
MAMMARY GLAND	Gland, mammary	-	X	X	Collected with inguinal skin in female rats.
PARATHYROID GLAND	Gland, parathyroid	-	X	X	Collect with thyroid: Examine only if present in the routine section of thyroid.
PITUITARY GLAND	Gland, pituitary	-	X	X	-
PROSTATE GLAND	Gland, prostate	X	X	X	-
SALIVARY GLAND	Gland, salivary	-	X	X	Submandibular.
COAGULATING GLAND	Gland, seminal vesicle with coagulating gland	X	X	X	Paired examination.
SEMINAL VESICLE					
THYROID GLAND	Gland, thyroid	X	X	X	Weighed after fixation.
-	Gross lesions/masses	-	X	X	-
PEYER'S PATCH	Gut-associated lymphoid tissue	-	X	X	Collect with small intestine.
HEART	Heart	X	X	X	-
KIDNEY	Kidney	X	X	X	Paired weight and examination.

Provantis Tissue Term	Protocol Tissue Term	Weigh	Collect	Micro Eval	Comment
INTESTINE, CECUM	Large intestine, cecum	-	X	X	-
INTESTINE, COLON	Large intestine, colon	-	X	X	-
INTESTINE, RECTUM	Large intestine, rectum	-	X	X	-
LIVER	Liver	X	X	X	-
LUNG	Lung	X	X	X	Infused with 10% neutral buffered formalin.
LYMPH NODE, MANDIBULAR	Lymph node, mandibular	-	X	X	-
LYMPH NODE, MESENTERIC	Lymph node, mesenteric	-	X	X	-
SKELETAL MUSCLE	Muscle, skeletal	-	X	X	From thigh
NOSE, LEVELS 1-5	Nasal Passages	-	X	X	Collect with sinuses.
NERVE, OPTIC	Nerve, optic	-	X	X	Preserve in Davidson's fixative; Examine only if present in the routine section of the eye.
NERVE, SCIATIC	Nerve, sciatic	-	X	X	-
OVARY	Ovary	X	X	X	Paired weight and examination.
OVIDUCT	Oviduct	X	X	X	Collect and weigh with uterus.
PANCREAS	Pancreas	-	X	X	-
SKIN, MAMMARY	Skin	-	X	X	-
INTESTINE, DUODENUM	Small intestine, duodenum	-	X	X	-
INTESTINE, ILEUM	Small intestine, ileum	-	X	X	-
INTESTINE, JEJUNUM	Small intestine, jejunum	-	X	X	-
SPINAL CORD	Spinal cord	-	X	X	Cervical, thoracic, lumbar.
SPLEEN	Spleen	X	X	X	-
STOMACH	Stomach	-	X	X	Glandular and nonglandular regions.
TESTIS	Testis	X	X	X	Paired weight and examination; Preserve in Modified Davidson's fixative.
THYMUS	Thymus	X	X	X	-
TONGUE	Tongue	-	X	X	Collect with larynx and pharynx.
TRACHEA	Trachea	-	X	X	-
URETER	Ureter	-	X	X	-
URINARY BLADDER	Urinary bladder	-	X	X	-
UTERUS	Uterus	X	X	X	-
VAGINA	Vagina	-	X	X	-

Micro Eval = Microscopic Evaluation; X = procedure to be conducted; - = not required

^a Bone marrow smear evaluation was performed by Charles River Laboratories, Preclinical Services Nevada and reported separately.

Tissues required for microscopic evaluation were trimmed, processed routinely, embedded in paraffin, and stained with hematoxylin and eosin (H&E) by Charles River Laboratories, Pathology Associates - Maryland. The nasal tissue was evaluated consistent with the procedure

described by Young¹ (levels 2-5), with an additional rostral section to include the nares (level 1). Microscopic evaluation was conducted by the undersigned board-certified veterinary pathologist on protocol-specified tissues from main study animals in the 0 ppm and 10000 ppm dosage groups. Additionally, nasal passages and gross lesions were evaluated in all animals from the remaining main study animals. Gross lesions from all animals (including cholinesterase set) were requested by the Study Director to be evaluated. Tissues were evaluated by light microscopy, and the results were entered directly into a validated pathology computer program (Text Table 3) for preparation of data tables.

7.1. Computerized Systems

Critical computerized systems used in the study by the Test Site are listed below (See Text Table 3).

Text Table 3
Computerized Systems

System Name	Version Number	Description of Data Collected and/or Analyzed
Provantis NT 2000	V3.4	Histopathology (Test Site)
See Main Study Report	See Main Study Report	Necropsy and Organ Weight (Testing Facility)

7.2. Disposition of Study Materials

Prior to finalization of the report, pathology materials were sent to Charles River Laboratories, Preclinical Services, Horsham, Pennsylvania, and the Final Report was sent to the Study Director. The signed hard copy of the pathology report is considered raw data.

8. RESULTS AND DISCUSSIONS

8.1. Gross Pathology

8.1.1. Scheduled Euthanasia Animals (Day 91)

(Table 1, Appendix 2)

No test article-related gross findings were noted. The gross findings observed were considered incidental, of the nature commonly observed in this strain and age of rat, and/or were of similar incidence in control and treated animals and, therefore, were considered unrelated to administration of Malathion Technical.

8.2. Organ Weights

8.2.1. Scheduled Euthanasia Animals (Day 91)

(Table 2, Appendix 2)

Test article-related organ weight changes are summarized in [Text Table 4](#).

Text Table 4
Summary Organ Weight Data – Scheduled Euthanasia (Day 91)

Group Dose (ppm) No. animals per group	Males					Females				
	I	II	III	IV	V	I	II	III	IV	V
	0	100	500	5000	10000	0	100	500	5000	10000
	10	10	10	10	10	10	10	10	10	10
Liver (No. weighed)^a										
Absolute value	15.61± 3.35	14.49± 1.59	14.73± 2.46	16.30± 2.70	19.96± 4.06*	8.22± 1.36	7.65± 0.88	7.91± 1.27	8.72± 1.42	8.93± 1.35
% of body weight	2.489± 0.252	2.460± 0.123	2.539± 0.297	2.986± 0.151*	3.589± 0.308*	2.349± 0.177	2.374± 0.133	2.436± 0.244	2.494± 0.178	3.029± 0.385*
% of brain weight	703.6± 144.4	645.5± 63.8	682.8± 112.3	755.0± 115.7	920.0± 169.1*	405.5± 67.3	378.0± 50.7	388.9± 58.3	432.9± 77.0	433.9± 72.9
Kidneys (No. weighed)										
Absolute value	3.57± 0.42	3.42± 0.39	3.42± 0.36	3.31± 0.46	4.39± 0.80*	2.00± 0.23	2.03± 0.14	2.04± 0.27	2.23± 0.26	2.17± 0.25
% of body weight	0.575± 0.055	0.580± 0.051	0.591± 0.057	0.619± 0.113	0.794± 0.075*	0.574± 0.066	0.635± 0.060	0.633± 0.095	0.640± 0.045	0.739± 0.095*
% of brain weight	160.8± 17.0	152.1± 14.3	158.8± 18.4	153.7± 22.2	202.7± 34.3*	98.4± 10.5	100.2± 6.9	100.4± 12.7	110.8± 14.6	105.4± 14.9

^a All values expressed as mean ± standard deviation.

* Significantly different from the carrier group value ($p \leq 0.01$).

There were no microscopic findings in the liver or kidney that explain these changes in organ weights.

No other test article-related organ weight changes were noted. There were other isolated organ weight values that were statistically different from their respective controls. There were, however, no patterns, trends, or correlating data to suggest these values were toxicologically relevant. Thus, other organ weight differences observed were considered incidental and unrelated to administration of Malathion Technical.

8.3. Histopathology

8.3.1. Scheduled Euthanasia (Day 91)

([Table 3](#), [Appendix 2](#))

Test article-related microscopic findings are summarized in [Text Table 5](#).

Text Table 5
Summary Microscopic Findings – Scheduled Euthanasia (Day 91)

Group Dose (ppm) No. animals examined	Males					Females				
	I	II	III	IV	V	I	II	III	IV	V
	0	100	500	5000	10000	0	100	500	5000	10000
	10	10	10	10	10	10	10	10	10	10
Nose, Level 2 (No. Examined)	10	10	10	10	10	10	10	10	10	10
Depletion, Goblet Cell	(0) ^a	(0)	(5)	(10)	(9)	(0)	(0)	(5)	(8)	(10)
Minimal	0	0	5	1	3	0	0	3	4	1
Mild	0	0	0	7	2	0	0	2	3	2
Moderate	0	0	0	2	4	0	0	0	1	6
Marked	0	0	0	0	0	0	0	0	0	1
Nose, Level 3 (No. Examined)	10	10	10	10	10	10	10	10	10	10
Hyperplasia, Olfactory Epithelium	(0)	(0)	(0)	(9)	(10)	(0)	(0)	(0)	(9)	(10)
Minimal	0	0	0	6	7	0	0	0	5	3
Mild	0	0	0	3	3	0	0	0	4	6
Moderate	0	0	0	0	0	0	0	0	0	1
Nose, Level 4 (No. Examined)	10	10	10	10	10	10	10	10	10	10
Hyperplasia, Olfactory Epithelium	(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(10)	(10)
Minimal	0	0	0	0	0	0	0	0	1	0
Mild	0	0	0	7	7	0	0	0	4	5
Moderate	0	0	0	3	3	0	0	0	5	5
Nose, Level 5 (No. Examined)	10	8	10	10	10	10	10	10	9	10
Hyperplasia, Olfactory Epithelium	(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(9)	(10)
Minimal	0	0	0	0	1	0	0	0	0	0
Mild	0	0	0	4	2	0	0	0	4	3
Moderate	0	0	0	6	7	0	0	0	5	7

^a Numbers in parentheses represent the number of animals with the finding.

Depletion of the goblet cells was noted on the nasal septum of Nose, Level 2. Small numbers of cells with abundant non-staining cytoplasm were also interspersed where there was depletion of goblet cells. Hyperplasia of olfactory epithelium was a diffuse change noted at Nose, Levels 3, 4 and 5, and consisted of increased numbers of nuclei. The hyperplasia was judged to be minimal when there was preservation of the nuclear free layer, mild when there was loss of the nuclear free layer and moderate when the olfactory epithelium had no nuclear free layer and the surface of the normally straight lining was undulating and/or contained multiple invaginations forming rosette like structures.

Other microscopic findings observed were considered incidental, of the nature commonly observed in this strain and age of rat, and/or were of similar incidence and severity in control and treated animals and, therefore, were considered unrelated to administration of Malathion Technical.

9. CONCLUSIONS

Oral (diet) administration of Malathion Technical to rats for 90 days at concentration of 5,000 or 10,000 ppm resulted in organ weight increases in the liver (males and females) and kidney (males only at 10,000 ppm only). There were no microscopic correlates for these organ weight changes. Microscopic findings related to the test article in rats provided diet at 5000 or 10,000

ppm Malathion Technical were present in the nasal cavity (depletion of goblet cells and olfactory epithelial hyperplasia).

Oral (diet) administration of Malathion Technical to rats for 90 days at concentration of 500 ppm resulted in no organ weight changes. Microscopic findings related to the test article in rats provided diet at 500 ppm Malathion Technical were present in the rostral nasal cavity (minimal to mild depletion of goblet cells).

Oral (diet) administration of Malathion Technical to rats for 90 days at concentration of 100 ppm resulted in no organ weight, gross or microscopic findings associated with dietary Malathion Technical.

10. REPORT APPROVAL



Date: 11-JAN-2012

Carol J. Detrisac, DVM, PhD, DACVP

Study Pathologist

Charles River Laboratories, Pathology Associates - Illinois

11. REFERENCES

- ¹ Young, J.T., Histopathologic Examination of the Rat Nasal Cavity. *Fund. Appl. Toxicol.* 1:309-312, 1981.

Table 1
Pathology - Intergroup Comparison of Gross Pathology Observations (Day 91)

Final Pathology Report

PTA005-01/04

Charles River Laboratories
Pathology - Intergroup Comparison of Gross Pathology Observations

Date: 22-Dec-2011 08:49

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Removal Reason: SCHEDULE SACRIFICED		----- MALES -----					----- FEMALES -----				
		0 ppm 10 (10)	100 ppm 10 (10)	500 ppm 10 (10)	5000 ppm 10 (10)	10000 ppm 10 (10)	0 ppm 10 (10)	100 ppm 10 (10)	500 ppm 10 (10)	5000 ppm 10 (10)	10000 ppm 10 (10)
Number of Animals on Study :											
Number of Animals Completed:											
ADRENAL GLAND;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10
AORTA;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10
BONE MARROW, FEMUR;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10
BONE, FEMUR;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10
BONE, STERNUM;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10
BRAIN;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10
CERVIX;											
Submitted.....		(-)	(-)	(-)	(-)	(-)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		-	-	-	-	-	10	10	10	10	10
COAGULATING GLAND;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(-)	(-)	(-)	(-)	(-)
No Visible Lesions.....		10	10	10	10	10	-	-	-	-	-
EPIDIDYMIS;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(-)	(-)	(-)	(-)	(-)
No Visible Lesions.....		10	10	10	10	10	-	-	-	-	-
ESOPHAGUS;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)

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Testing Facility Study No. TQC00066

PTA005-01/04

Charles River Laboratories
Pathology - Intergroup Comparison of Gross Pathology Observations

Date: 22-Dec-2011 08:49

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Removal Reason: SCHEDULE SACRIFICED		----- MALES -----					----- FEMALES -----				
	Number of Animals on Study : Number of Animals Completed:	0 ppm 10 (10)	100 ppm 10 (10)	500 ppm 10 (10)	5000 ppm 10 (10)	10000 ppm 10 (10)	0 ppm 10 (10)	100 ppm 10 (10)	500 ppm 10 (10)	5000 ppm 10 (10)	10000 ppm 10 (10)
ESOPHAGUS; (continued)											
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10
EYE;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10
HARDERIAN GLAND;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10
HEART;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10
INTESTINE, CECUM;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10
INTESTINE, COLON;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10
INTESTINE, DUODENUM;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10
INTESTINE, ILEUM;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10
INTESTINE, JEJUNUM;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10
INTESTINE, RECTUM;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10

Final Pathology Report

PTA005-01/04

Charles River Laboratories
Pathology - Intergroup Comparison of Gross Pathology Observations

Date: 22-Dec-2011 08:49

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Removal Reason: SCHEDULE SACRIFICED		----- MALES -----					----- FEMALES -----				
		0 ppm 10 (10)	100 ppm 10 (10)	500 ppm 10 (10)	5000 ppm 10 (10)	10000 ppm 10 (10)	0 ppm 10 (10)	100 ppm 10 (10)	500 ppm 10 (10)	5000 ppm 10 (10)	10000 ppm 10 (10)
Number of Animals on Study :											
Number of Animals Completed:											
KIDNEY;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		10	10	10	9	9	10	10	10	10	10
Dilation		0	0	0	1	1	0	0	0	0	0
LARYNX;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10
LIVER;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		9	10	10	10	10	10	10	10	10	10
Misshapen		1	0	0	0	0	0	0	0	0	0
LUNG;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10
LYMPH NODE, MANDIBULAR;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		9	9	10	9	10	10	9	10	10	10
Dark Red		1	1	0	1	0	0	0	0	0	0
Red		0	0	0	0	0	0	1	0	0	0
LYMPH NODE, MESENTERIC;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10
MAMMARY GLAND;											
Submitted.....		(-)	(-)	(-)	(-)	(-)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		-	-	-	-	-	10	10	10	10	10
NERVE, OPTIC;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10
NERVE, SCIATIC;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)

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Date: 22-Dec-2011 08:49

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Removal Reason: SCHEDULE SACRIFICED		----- MALES -----					----- FEMALES -----				
	Number of Animals on Study : Number of Animals Completed:	0 ppm 10 (10)	100 ppm 10 (10)	500 ppm 10 (10)	5000 ppm 10 (10)	10000 ppm 10 (10)	0 ppm 10 (10)	100 ppm 10 (10)	500 ppm 10 (10)	5000 ppm 10 (10)	10000 ppm 10 (10)
NERVE, SCIATIC; (continued)											
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10
NOSE, LEVEL 1;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10
NOSE, LEVEL 2;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10
NOSE, LEVEL 3;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10
NOSE, LEVEL 4;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10
NOSE, LEVEL 5;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10
OVARY;											
Submitted.....		(-)	(-)	(-)	(-)	(-)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		-	-	-	-	-	10	10	10	10	10
OVIDUCT;											
Submitted.....		(-)	(-)	(-)	(-)	(-)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		-	-	-	-	-	10	10	10	10	10
PANCREAS;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10
PARATHYROID GLAND;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10

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Pathology - Intergroup Comparison of Gross Pathology Observations

Date: 22-Dec-2011 08:49

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Removal Reason: SCHEDULE SACRIFICED		----- MALES -----					----- FEMALES -----				
		0 ppm 10 (10)	100 ppm 10 (10)	500 ppm 10 (10)	5000 ppm 10 (10)	10000 ppm 10 (10)	0 ppm 10 (10)	100 ppm 10 (10)	500 ppm 10 (10)	5000 ppm 10 (10)	10000 ppm 10 (10)
Number of Animals on Study :											
Number of Animals Completed:											
PEYERS PATCH;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10
PHARYNX;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10
PITUITARY GLAND;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10
PROSTATE GLAND;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(-)	(-)	(-)	(-)	(-)
No Visible Lesions.....		10	10	10	10	10	-	-	-	-	-
SALIVARY GLAND;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10
SEMINAL VESICLE;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(-)	(-)	(-)	(-)	(-)
No Visible Lesions.....		10	10	10	10	10	-	-	-	-	-
SKELETAL MUSCLE;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10
SKIN, MAMMARY;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10
SPINAL CORD;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
No Visible Lesions.....		10	10	10	10	10	10	10	10	10	10
SPLEEN;											
Submitted.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Removal Reason: SCHEDULE SACRIFICED		----- MALES -----					----- FEMALES -----				
		0 ppm 10 (10)	100 ppm 10 (10)	500 ppm 10 (10)	5000 ppm 10 (10)	10000 ppm 10 (10)	0 ppm 10 (10)	100 ppm 10 (10)	500 ppm 10 (10)	5000 ppm 10 (10)	10000 ppm 10 (10)
	Number of Animals on Study :										
	Number of Animals Completed:										
SPLEEN; (continued)											
	No Visible Lesions.....	9	10	10	10	10	10	10	10	10	10
	Constricted Area	1	0	0	0	0	0	0	0	0	0
STOMACH;											
	Submitted.....	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
	No Visible Lesions.....	10	10	10	10	10	10	10	10	10	10
TESTIS;											
	Submitted.....	(10)	(10)	(10)	(10)	(10)	(-)	(-)	(-)	(-)	(-)
	No Visible Lesions.....	10	10	10	10	10	-	-	-	-	-
THYMUS;											
	Submitted.....	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
	No Visible Lesions.....	9	10	10	10	10	10	10	10	10	10
	Red Areas	1	0	0	0	0	0	0	0	0	0
THYROID GLAND;											
	Submitted.....	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
	No Visible Lesions.....	10	10	10	10	10	10	10	10	10	10
TONGUE;											
	Submitted.....	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
	No Visible Lesions.....	10	10	10	10	10	10	10	10	10	10
TRACHEA;											
	Submitted.....	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
	No Visible Lesions.....	10	10	10	10	10	10	10	10	10	10
URETER;											
	Submitted.....	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
	No Visible Lesions.....	10	10	10	10	10	10	10	10	10	10
URINARY BLADDER;											
	Submitted.....	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
	No Visible Lesions.....	10	10	10	10	10	10	10	10	10	10

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 TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
 Malathion Technical in Rats

Date: 22-Dec-2011 08:49

Removal Reason: SCHEDULE SACRIFICED		----- MALES -----					----- FEMALES -----				
		0	100	500	5000	10000	0	100	500	5000	10000
		ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	Number of Animals on Study :	10	10	10	10	10	10	10	10	10	10
	Number of Animals Completed:	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
UTERUS;											
	Submitted.....	(-)	(-)	(-)	(-)	(-)	(10)	(10)	(10)	(10)	(10)
	No Visible Lesions.....	-	-	-	-	-	10	10	10	10	10
VAGINA;											
	Submitted.....	(-)	(-)	(-)	(-)	(-)	(10)	(10)	(10)	(10)	(10)
	No Visible Lesions.....	-	-	-	-	-	10	10	10	10	10
SKIN;											
	Submitted.....	(0)	(0)	(0)	(0)	(1)	(0)	(0)	(0)	(1)	(0)
	No Visible Lesions.....	0	0	0	0	0	0	0	0	0	0
	Hernia	0	0	0	0	1	0	0	0	1	0
ADIPOSE;											
	Submitted.....	(0)	(0)	(0)	(0)	(0)	(1)	(0)	(0)	(0)	(0)
	No Visible Lesions.....	0	0	0	0	0	0	0	0	0	0
	Mass	0	0	0	0	0	1	0	0	0	0

Table 2
Summary and Individual Organ Weights (Absolute, Percent Body Weight, and Percent
Brain Weight) (Day 91)

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PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 1 (PAGE 1): ORGAN WEIGHT, RATIO OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT AND RATIO OF ORGAN WEIGHT TO BRAIN WEIGHT
INDIVIDUAL AND SUMMARY DATA - MALE RATS

SUMMARY OF ORGAN WEIGHTS							
DOSAGE GROUP CONCENTRATION (PPM)a		I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000	
RATS TESTED	N	10	10	10	10	10	
TERMINAL BODY WEIGHT	MEAN±S.D.	623.3 ± 74.4	589.4 ± 61.2	580.1 ± 70.1	544.3 ± 75.8	552.3 ± 77.1	
EPIDIDYMIDES PAIRED	MEAN±S.D.	1.61 ± 0.18	1.60 ± 0.10	1.59 ± 0.17	1.41 ± 0.13**	1.45 ± 0.11*	
TESTES PAIRED	MEAN±S.D.	3.78 ± 0.30	3.90 ± 0.23	3.64 ± 0.46	3.60 ± 0.45	3.96 ± 0.35	
PROSTATE	MEAN±S.D.	1.32 ± 0.25	1.31 ± 0.19	1.12 ± 0.23	1.05 ± 0.15*	1.03 ± 0.22**	
BRAIN	MEAN±S.D.	2.218 ± 0.058	2.244 ± 0.088	2.159 ± 0.089	2.156 ± 0.064	2.166 ± 0.112	
LIVER	MEAN±S.D.	15.61 ± 3.35	14.49 ± 1.59	14.73 ± 2.46	16.30 ± 2.70	19.96 ± 4.06**	
KIDNEYS PAIRED	MEAN±S.D.	3.57 ± 0.42	3.42 ± 0.39	3.42 ± 0.36	3.31 ± 0.46	4.39 ± 0.80**	
ADRENALS PAIRED	MEAN±S.D.	0.065 ± 0.009	0.067 ± 0.009	0.060 ± 0.011	0.055 ± 0.008	0.058 ± 0.009	
SPLEEN	MEAN±S.D.	0.91 ± 0.16	1.01 ± 0.17	0.96 ± 0.14	0.85 ± 0.14	0.91 ± 0.12	
LUNGS	MEAN±S.D.	1.92 ± 0.17	1.84 ± 0.23	1.88 ± 0.16	1.71 ± 0.16	1.80 ± 0.27	
THYMUS	MEAN±S.D.	0.35 ± 0.11	0.34 ± 0.07	0.38 ± 0.12	0.32 ± 0.08	0.36 ± 0.08	
HEART	MEAN±S.D.	1.85 ± 0.27	1.79 ± 0.17	1.71 ± 0.12	1.68 ± 0.19	1.77 ± 0.25	
FIXED THYROID/PARATHYROID	MEAN±S.D.	0.04 ± 0.01	0.03 ± 0.01	0.04 ± 0.01	0.04 ± 0.01	0.04 ± 0.00	
SEMINAL VESICLES/ COAGULATING GLAND	MEAN±S.D.	1.88 ± 0.34	1.97 ± 0.42	1.88 ± 0.39	1.69 ± 0.28	1.76 ± 0.27	

ALL WEIGHTS WERE RECORDED IN GRAMS (G).

a. Rats were given continual access to the carrier control or test substance in the diet.

* Significantly different from the carrier group value (p≤0.05).

** Significantly different from the carrier group value (p≤0.01).

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Testing Facility Study No. TQC00066

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 1 (PAGE 2): ORGAN WEIGHT, RATIO OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT AND RATIO OF ORGAN WEIGHT TO BRAIN WEIGHT
INDIVIDUAL AND SUMMARY DATA - MALE RATS

SUMMARY OF RATIOS OF ORGAN WEIGHTS TO TERMINAL BODY WEIGHTS						
DOSAGE GROUP CONCENTRATION (PPM)a		I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS TESTED	N	10	10	10	10	10
TERMINAL BODY WEIGHT	MEAN±S.D.	623.3 ± 74.4	589.4 ± 61.2	580.1 ± 70.1	544.3 ± 75.8	552.3 ± 77.1
EPIDIDYMIDES PAIRED (%)	MEAN±S.D.	0.261 ± 0.038	0.274 ± 0.026	0.276 ± 0.035	0.263 ± 0.043	0.267 ± 0.036
TESTES PAIRED (%)	MEAN±S.D.	0.609 ± 0.060	0.667 ± 0.062	0.632 ± 0.092	0.668 ± 0.102	0.725 ± 0.080**
PROSTATE (%)	MEAN±S.D.	0.213 ± 0.047	0.227 ± 0.044	0.194 ± 0.041	0.197 ± 0.042	0.187 ± 0.030
BRAIN (%)	MEAN±S.D.	0.359 ± 0.039	0.382 ± 0.033	0.376 ± 0.047	0.403 ± 0.050	0.398 ± 0.051
LIVER (%)	MEAN±S.D.	2.489 ± 0.252	2.460 ± 0.123	2.539 ± 0.297	2.986 ± 0.151**	3.589 ± 0.308**
KIDNEYS PAIRED (%)	MEAN±S.D.	0.575 ± 0.055	0.580 ± 0.051	0.591 ± 0.057	0.619 ± 0.113	0.794 ± 0.075**
ADRENALS PAIRED (%)b	MEAN±S.D.	10.461 ± 1.782	11.361 ± 1.520	10.270 ± 1.556	10.306 ± 1.804	10.615 ± 1.768
SPLEEN (%)	MEAN±S.D.	0.147 ± 0.026	0.171 ± 0.024	0.165 ± 0.025	0.156 ± 0.023	0.167 ± 0.027
LUNGS (%)	MEAN±S.D.	0.310 ± 0.027	0.314 ± 0.036	0.325 ± 0.033	0.316 ± 0.039	0.327 ± 0.030
THYMUS (%)	MEAN±S.D.	0.056 ± 0.020	0.058 ± 0.013	0.067 ± 0.020	0.059 ± 0.015	0.064 ± 0.013
HEART (%)	MEAN±S.D.	0.296 ± 0.040	0.305 ± 0.018	0.295 ± 0.027	0.309 ± 0.021	0.319 ± 0.026
FIXED THYROID/PARATHYROID (%)b	MEAN±S.D.	5.594 ± 1.514	5.840 ± 1.589	7.848 ± 2.315**	7.103 ± 1.645	6.594 ± 1.181
SEMINAL VESICLES/ COAGULATING GLAND (%)b	MEAN±S.D.	306.1 ± 67.2	340.6 ± 88.6	327.4 ± 72.7	315.7 ± 73.3	323.4 ± 56.0

ALL WEIGHTS WERE RECORDED IN GRAMS (G).

RATIOS (%) = (ORGAN WEIGHT/TERMINAL BODY WEIGHT) X 100.

a. Rats were given continual access to the carrier control or test substance in the diet.

b. Value was multiplied by 1000.

** Significantly different from the carrier group value (p≤0.01).

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Testing Facility Study No. TQC00066

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 1 (PAGE 3): ORGAN WEIGHT, RATIO OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT AND RATIO OF ORGAN WEIGHT TO BRAIN WEIGHT
INDIVIDUAL AND SUMMARY DATA - MALE RATS

SUMMARY OF RATIOS OF ORGAN WEIGHTS TO BRAIN WEIGHTS						
DOSAGE GROUP CONCENTRATION (PPM)a		I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS TESTED	N	10	10	10	10	10
BRAIN WEIGHT	MEAN±S.D.	2.218 ± 0.058	2.244 ± 0.088	2.159 ± 0.089	2.156 ± 0.064	2.166 ± 0.112
EPIDIDYMIDES PAIRED (%)	MEAN±S.D.	72.4 ± 7.7	71.5 ± 3.6	74.0 ± 9.0	65.3 ± 6.2*	67.1 ± 2.6
TESTES PAIRED (%)	MEAN±S.D.	170.4 ± 14.4	174.1 ± 10.9	169.0 ± 22.5	167.0 ± 20.0	182.7 ± 12.7
PROSTATE (%)	MEAN±S.D.	59.3 ± 10.8	58.6 ± 8.7	51.7 ± 9.3	48.8 ± 7.7*	47.2 ± 8.7**
LIVER (%)	MEAN±S.D.	703.6 ± 144.4	645.5 ± 63.8	682.8 ± 112.3	755.0 ± 115.7	920.0 ± 169.1**
KIDNEYS PAIRED (%)	MEAN±S.D.	160.8 ± 17.0	152.1 ± 14.3	158.8 ± 18.4	153.7 ± 22.2	202.7 ± 34.3**
ADRENALS PAIRED (%)	MEAN±S.D.	2.9 ± 0.4	3.0 ± 0.4	2.8 ± 0.5	2.6 ± 0.4	2.7 ± 0.4
SPLEEN (%)	MEAN±S.D.	41.0 ± 7.0	45.1 ± 7.3	44.4 ± 7.1	39.7 ± 6.7	42.3 ± 6.0
LUNGS (%)	MEAN±S.D.	86.8 ± 7.4	82.1 ± 10.4	87.0 ± 7.3	79.3 ± 6.7	83.0 ± 10.5
THYMUS (%)	MEAN±S.D.	15.7 ± 4.6	15.4 ± 3.0	17.7 ± 6.0	14.8 ± 4.0	16.5 ± 3.3
HEART (%)	MEAN±S.D.	83.6 ± 12.7	79.9 ± 6.4	79.5 ± 7.6	77.8 ± 9.0	81.5 ± 10.6
FIXED THYROID/PARATHYROID (%)	MEAN±S.D.	1.6 ± 0.5	1.5 ± 0.4	2.1 ± 0.6	1.8 ± 0.5	1.7 ± 0.2
SEMINAL VESICLES/ COAGULATING GLAND (%)	MEAN±S.D.	84.7 ± 14.4	88.3 ± 20.2	86.8 ± 16.9	78.3 ± 13.4	81.3 ± 10.5

ALL WEIGHTS WERE RECORDED IN GRAMS (G).

RATIOS (%) = (ORGAN WEIGHT/BRAIN WEIGHT) X 100.

a. Rats were given continual access to the carrier control or test substance in the diet.

* Significantly different from the carrier group value (p≤0.05).

** Significantly different from the carrier group value (p≤0.01).

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Testing Facility Study No. TQC00066

PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 1 (PAGE 4): ORGAN WEIGHT, RATIO OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT AND RATIO OF ORGAN WEIGHT TO BRAIN WEIGHT
INDIVIDUAL AND SUMMARY DATA - FEMALE RATS

SUMMARY OF ORGAN WEIGHTS						
DOSAGE GROUP CONCENTRATION (PPM)a		I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS TESTED	N	10	10	10	10	10
TERMINAL BODY WEIGHT	MEAN±S.D.	351.5 ± 60.0	322.6 ± 36.1	324.8 ± 39.4	349.8 ± 52.2	296.0 ± 40.6
BRAIN	MEAN±S.D.	2.030 ± 0.082	2.029 ± 0.068	2.033 ± 0.094	2.019 ± 0.049	2.064 ± 0.100
LIVER	MEAN±S.D.	8.22 ± 1.36	7.65 ± 0.88	7.91 ± 1.27	8.72 ± 1.42	8.93 ± 1.35
KIDNEYS PAIRED	MEAN±S.D.	2.00 ± 0.23	2.03 ± 0.14	2.04 ± 0.27	2.23 ± 0.26	2.17 ± 0.25
ADRENALS PAIRED	MEAN±S.D.	0.067 ± 0.015	0.064 ± 0.012	0.068 ± 0.012	0.061 ± 0.004	0.069 ± 0.026
SPLEEN	MEAN±S.D.	0.69 ± 0.16	0.64 ± 0.11	0.63 ± 0.06	0.65 ± 0.14	0.57 ± 0.08
LUNGS	MEAN±S.D.	1.36 ± 0.15	1.35 ± 0.12	1.34 ± 0.10	1.33 ± 0.07	1.24 ± 0.10
THYMUS	MEAN±S.D.	0.37 ± 0.08	0.34 ± 0.09	0.32 ± 0.07	0.36 ± 0.08	0.32 ± 0.07
OVARIES PAIRED	MEAN±S.D.	0.094 ± 0.022	0.101 ± 0.019	0.099 ± 0.017	0.101 ± 0.010	0.089 ± 0.023
UTERUS NON- GRAVID W/ CERVIX	MEAN±S.D.	0.73 ± 0.24	0.67 ± 0.19	0.84 ± 0.25	0.80 ± 0.31	0.70 ± 0.33
HEART	MEAN±S.D.	1.19 ± 0.20	1.14 ± 0.15	1.09 ± 0.15	1.10 ± 0.11	1.05 ± 0.08
FIXED THYROID/PARATHYROID	MEAN±S.D.	0.02 ± 0.01	0.04 ± 0.01	0.04 ± 0.01	0.03 ± 0.01	0.03 ± 0.01

ALL WEIGHTS WERE RECORDED IN GRAMS (G).

a. Rats were given continual access to the carrier control or test substance in the diet.

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PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 1 (PAGE 5): ORGAN WEIGHT, RATIO OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT AND RATIO OF ORGAN WEIGHT TO BRAIN WEIGHT
INDIVIDUAL AND SUMMARY DATA - FEMALE RATS

SUMMARY OF RATIOS OF ORGAN WEIGHTS TO TERMINAL BODY WEIGHTS						
DOSAGE GROUP CONCENTRATION (PPM)a		I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS TESTED	N	10	10	10	10	10
TERMINAL BODY WEIGHT	MEAN±S.D.	351.5 ± 60.0	322.6 ± 36.1	324.8 ± 39.4	349.8 ± 52.2	296.0 ± 40.6
BRAIN (%)	MEAN±S.D.	0.591 ± 0.101	0.637 ± 0.078	0.633 ± 0.061	0.588 ± 0.082	0.709 ± 0.095**
LIVER (%)	MEAN±S.D.	2.349 ± 0.177	2.374 ± 0.133	2.436 ± 0.244	2.494 ± 0.178	3.029 ± 0.385**
KIDNEYS PAIRED (%)	MEAN±S.D.	0.574 ± 0.066	0.635 ± 0.060	0.633 ± 0.095	0.640 ± 0.045	0.739 ± 0.095**
ADRENALS PAIRED (%)b	MEAN±S.D.	19.638 ± 5.988	20.097 ± 3.828	20.928 ± 3.616	17.645 ± 2.727	23.843 ± 10.244
SPLEEN (%)	MEAN±S.D.	0.195 ± 0.027	0.199 ± 0.033	0.197 ± 0.020	0.189 ± 0.049	0.195 ± 0.027
LUNGS (%)	MEAN±S.D.	0.394 ± 0.068	0.421 ± 0.036	0.416 ± 0.040	0.384 ± 0.044	0.424 ± 0.047
THYMUS (%)	MEAN±S.D.	0.105 ± 0.020	0.105 ± 0.025	0.097 ± 0.017	0.102 ± 0.022	0.112 ± 0.033
OVARIES PAIRED (%)	MEAN±S.D.	0.028 ± 0.006	0.033 ± 0.007	0.030 ± 0.007	0.029 ± 0.007	0.029 ± 0.006
UTERUS NON- GRAVID W/ CERVIX (%)	MEAN±S.D.	0.215 ± 0.089	0.210 ± 0.062	0.269 ± 0.109	0.235 ± 0.104	0.236 ± 0.112
HEART (%)	MEAN±S.D.	0.343 ± 0.054	0.356 ± 0.053	0.337 ± 0.028	0.316 ± 0.032	0.360 ± 0.054
FIXED THYROID/PARATHYROID (%)b	MEAN±S.D.	7.220 ± 1.980	11.390 ± 4.032*	10.752 ± 2.246*	8.364 ± 3.974	8.948 ± 3.771

ALL WEIGHTS WERE RECORDED IN GRAMS (G).

RATIOS (%) = (ORGAN WEIGHT/TERMINAL BODY WEIGHT) X 100.

a. Rats were given continual access to the carrier control or test substance in the diet.

b. Value was multiplied by 1000.

* Significantly different from the carrier group value (p≤0.05).

** Significantly different from the carrier group value (p≤0.01).

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PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 1 (PAGE 6): ORGAN WEIGHT, RATIO OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT AND RATIO OF ORGAN WEIGHT TO BRAIN WEIGHT
INDIVIDUAL AND SUMMARY DATA - FEMALE RATS

SUMMARY OF RATIOS OF ORGAN WEIGHTS TO BRAIN WEIGHTS						
DOSAGE GROUP CONCENTRATION (PPM)a		I 0 (CARRIER CONTROL)	II 100	III 500	IV 5000	V 10000
RATS TESTED	N	10	10	10	10	10
BRAIN WEIGHT	MEAN±S.D.	2.030 ± 0.082	2.029 ± 0.068	2.033 ± 0.094	2.019 ± 0.049	2.064 ± 0.100
LIVER (%)	MEAN±S.D.	405.5 ± 67.3	378.0 ± 50.7	388.9 ± 58.3	432.9 ± 77.0	433.9 ± 72.9
KIDNEYS PAIRED (%)	MEAN±S.D.	98.4 ± 10.5	100.2 ± 6.9	100.4 ± 12.7	110.8 ± 14.6	105.4 ± 14.9
ADRENALS PAIRED (%)	MEAN±S.D.	3.3 ± 0.7	3.2 ± 0.6	3.3 ± 0.6	3.0 ± 0.2	3.4 ± 1.3
SPLEEN (%)	MEAN±S.D.	33.7 ± 7.0	31.7 ± 5.5	31.1 ± 3.2	32.4 ± 7.0	27.8 ± 4.3
LUNGS (%)	MEAN±S.D.	66.9 ± 6.4	66.7 ± 6.6	66.0 ± 4.8	65.7 ± 3.8	60.2 ± 3.9*
THYMUS (%)	MEAN±S.D.	18.1 ± 3.8	16.6 ± 4.6	15.8 ± 3.1	17.6 ± 4.0	15.9 ± 4.1
OVARIES PAIRED (%)	MEAN±S.D.	4.6 ± 0.9	5.0 ± 1.0	4.9 ± 0.8	5.0 ± 0.5	4.3 ± 1.1
UTERUS NON- GRAVID W/ CERVIX (%)	MEAN±S.D.	36.1 ± 11.6	33.0 ± 8.8	41.8 ± 13.7	39.8 ± 15.7	34.1 ± 17.4
HEART (%)	MEAN±S.D.	58.7 ± 9.1	56.2 ± 7.6	53.7 ± 6.5	54.5 ± 6.6	50.9 ± 5.0
FIXED THYROID/PARATHYROID (%)	MEAN±S.D.	1.2 ± 0.4	1.8 ± 0.5	1.7 ± 0.4	1.4 ± 0.6	1.3 ± 0.5

ALL WEIGHTS WERE RECORDED IN GRAMS (G).

RATIOS (%) = (ORGAN WEIGHT/BRAIN WEIGHT) X 100.

a. Rats were given continual access to the carrier control or test substance in the diet.

* Significantly different from the carrier group value (p≤0.05).

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PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 1 (PAGE 7): ORGAN WEIGHT, RATIO OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT AND RATIO OF ORGAN WEIGHT TO BRAIN WEIGHT
INDIVIDUAL AND SUMMARY DATA - MALE RATS

INDIVIDUAL ORGAN WEIGHTS AND RATIOS (%) OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT													
DOSAGE GROUP I 0 (CARRIER CONTROL) PPM													
RAT NUMBER	TERMINAL BODY WEIGHT	EPIDIDYMITES PAIRED		TESTES PAIRED		PROSTATE		BRAIN		LIVER		KIDNEYS PAIRED	
		ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW
3776	542.	1.69	0.31	3.52	0.65	1.69	0.31	2.236	0.41	13.88	2.56	3.56	0.66
3777	785.	1.69	0.22	4.37	0.56	1.54	0.20	2.274	0.29	24.14	3.08	4.19	0.53
3778	613.	1.52	0.25	4.00	0.65	1.18	0.19	2.168	0.35	14.58	2.38	3.53	0.58
3779	529.	1.58	0.30	3.71	0.70	1.17	0.22	2.195	0.41	12.13	2.29	3.00	0.57
3780	576.	1.57	0.27	3.94	0.68	1.35	0.23	2.129	0.37	14.92	2.59	3.29	0.57
3781	660.	1.35	0.20	3.57	0.54	1.21	0.18	2.161	0.33	15.36	2.33	3.22	0.49
3782	579.	1.38	0.24	3.38	0.58	1.13	0.20	2.306	0.40	12.96	2.24	3.28	0.57
3783	635.	1.88	0.30	4.03	0.63	1.49	0.23	2.252	0.35	14.52	2.29	3.83	0.60
3784	665.	1.51	0.23	3.57	0.54	0.86	0.13	2.188	0.33	16.40	2.47	3.49	0.52
3785	649.	1.90	0.29	3.67	0.56	1.55	0.24	2.269	0.35	17.26	2.66	4.31	0.66

RAT NUMBER	TERMINAL BODY WEIGHT	ADRENALS PAIRED		SPLEEN		LUNGS		THYMUS		HEART		FIXED THYROID/ PARATHYROID	
		ABS. WT.	REL. % TBW a	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW a
3776	542.	0.078	14.39	0.74	0.14	1.68	0.31	0.31	0.06	1.59	0.29	0.02	3.69
3777	785.	0.066	8.41	1.02	0.13	2.12	0.27	0.44	0.06	2.12	0.27	0.05	6.37
3778	613.	0.062	10.11	0.70	0.11	1.79	0.29	0.31	0.05	1.96	0.32	0.05	8.16
3779	529.	0.050	9.45	0.90	0.17	1.88	0.36	0.30	0.06	1.44	0.27	0.03	5.67
3780	576.	0.061	10.59	1.00	0.17	1.88	0.33	0.20	0.03	2.22	0.38	0.04	6.94
3781	660.	0.074	11.21	0.63	0.10	1.92	0.29	0.29	0.04	1.55	0.23	0.02	3.03
3782	579.	0.061	10.54	1.01	0.17	1.74	0.30	0.57	0.10	1.82	0.31	0.03	5.18
3783	635.	0.076	11.97	1.06	0.17	2.06	0.32	0.28	0.04	1.78	0.28	0.03	4.72
3784	665.	0.063	9.47	1.08	0.16	1.94	0.29	0.46	0.07	2.15	0.32	0.04	6.02
3785	649.	0.055	8.47	0.97	0.15	2.24	0.34	0.34	0.05	1.90	0.29	0.04	6.16

ALL WEIGHTS WERE RECORDED IN GRAMS (G). ABS. WT. = ORGAN WEIGHT. REL. % TBW = (ORGAN WEIGHT/TERMINAL BODY WEIGHT) X 100.
a. Value was multiplied by 1000.

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TABLE 1 (PAGE 8): ORGAN WEIGHT, RATIO OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT AND RATIO OF ORGAN WEIGHT TO BRAIN WEIGHT
INDIVIDUAL AND SUMMARY DATA - MALE RATS

INDIVIDUAL ORGAN WEIGHTS AND RATIOS (%) OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT			
DOSAGE GROUP I		0 (CARRIER CONTROL) PPM	
RAT NUMBER	TERMINAL BODY WEIGHT	SEMINAL VESICLES/ COAGULATING GLAND	
		ABS.	REL.
		WT.	% TBW a
3776	542.	2.21	407.75
3777	785.	1.62	206.37
3778	613.	1.35	220.23
3779	529.	1.55	293.00
3780	576.	1.85	321.18
3781	660.	2.08	315.15
3782	579.	2.12	366.15
3783	635.	2.32	365.35
3784	665.	1.57	236.09
3785	649.	2.14	329.74

ALL WEIGHTS WERE RECORDED IN GRAMS (G). ABS. WT. = ORGAN WEIGHT. REL. % TBW = (ORGAN WEIGHT/TERMINAL BODY WEIGHT) X 100.
a. Value was multiplied by 1000.

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PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 1 (PAGE 9): ORGAN WEIGHT, RATIO OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT AND RATIO OF ORGAN WEIGHT TO BRAIN WEIGHT
INDIVIDUAL AND SUMMARY DATA - MALE RATS

INDIVIDUAL ORGAN WEIGHTS AND RATIOS (%) OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT													
DOSAGE GROUP II		100 PPM											
RAT NUMBER	TERMINAL BODY WEIGHT	EPIDIDYMIDES PAIRED		TESTES PAIRED		PROSTATE		BRAIN		LIVER		KIDNEYS PAIRED	
		ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW
3726	525.	1.54	0.29	3.83	0.73	1.46	0.28	2.198	0.42	12.12	2.31	3.09	0.59
3727	569.	1.67	0.29	3.92	0.69	1.27	0.22	2.348	0.41	13.31	2.34	3.49	0.61
3728	671.	1.53	0.23	4.21	0.63	1.48	0.22	2.224	0.33	16.90	2.52	3.98	0.59
3729	589.	1.73	0.29	4.12	0.70	1.35	0.23	2.312	0.39	15.58	2.64	3.78	0.64
3730	487.	1.47	0.30	3.57	0.73	1.25	0.26	2.054	0.42	11.94	2.45	2.84	0.58
3731	612.	1.58	0.26	3.61	0.59	1.28	0.21	2.336	0.38	15.12	2.47	3.70	0.60
3732	579.	1.49	0.26	3.72	0.64	1.25	0.22	2.215	0.38	14.65	2.53	3.28	0.57
3733	606.	1.65	0.27	4.18	0.69	1.10	0.18	2.200	0.36	15.31	2.53	2.84	0.47
3734	564.	1.76	0.31	4.04	0.72	1.67	0.30	2.245	0.40	14.43	2.56	3.58	0.63
3735	692.	1.63	0.24	3.84	0.55	1.03	0.15	2.307	0.33	15.56	2.25	3.60	0.52

RAT NUMBER	TERMINAL BODY WEIGHT	ADRENALS PAIRED		SPLEEN		LUNGS		THYMUS		HEART		FIXED THYROID/ PARATHYROID	
		ABS. WT.	REL. % TBW a	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW a
3726	525.	0.058	11.05	0.97	0.18	1.78	0.34	0.44	0.08	1.68	0.32	0.03	5.71
3727	569.	0.070	12.30	0.81	0.14	1.68	0.30	0.24	0.04	1.81	0.32	0.04	7.03
3728	671.	0.087	12.97	1.22	0.18	2.36	0.35	0.38	0.06	2.13	0.32	0.03	4.47
3729	589.	0.063	10.70	1.01	0.17	2.07	0.35	0.37	0.06	1.80	0.30	0.05	8.49
3730	487.	0.066	13.55	0.87	0.18	1.57	0.32	0.32	0.06	1.50	0.31	0.03	6.16
3731	612.	0.060	9.80	1.22	0.20	1.71	0.28	0.42	0.07	1.88	0.31	0.03	4.90
3732	579.	0.057	9.84	0.76	0.13	1.78	0.31	0.40	0.07	1.86	0.32	0.04	6.91
3733	606.	0.074	12.21	1.20	0.20	1.80	0.30	0.31	0.05	1.71	0.28	0.02	3.30
3734	564.	0.069	12.23	1.02	0.18	1.98	0.35	0.29	0.05	1.68	0.30	0.04	7.09
3735	692.	0.062	8.96	1.04	0.15	1.69	0.24	0.28	0.04	1.89	0.27	0.03	4.34

ALL WEIGHTS WERE RECORDED IN GRAMS (G). ABS. WT. = ORGAN WEIGHT. REL. % TBW = (ORGAN WEIGHT/TERMINAL BODY WEIGHT) X 100.
a. Value was multiplied by 1000.

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PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 1 (PAGE 10): ORGAN WEIGHT, RATIO OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT AND RATIO OF ORGAN WEIGHT TO BRAIN WEIGHT
INDIVIDUAL AND SUMMARY DATA - MALE RATS

INDIVIDUAL ORGAN WEIGHTS AND RATIOS (%) OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT				
DOSAGE GROUP II		100 PPM		
RAT NUMBER	TERMINAL BODY WEIGHT	SEMINAL VESICLES/ COAGULATING GLAND		
		ABS.	REL.	
		WT.	% TBW a	
3726	525.	2.61	497.14	
3727	569.	1.54	270.65	
3728	671.	2.41	359.16	
3729	589.	2.04	346.35	
3730	487.	2.02	414.78	
3731	612.	1.78	290.85	
3732	579.	2.13	367.88	
3733	606.	1.92	316.83	
3734	564.	2.12	375.89	
3735	692.	1.15	166.18	

ALL WEIGHTS WERE RECORDED IN GRAMS (G). ABS. WT. = ORGAN WEIGHT. REL. % TBW = (ORGAN WEIGHT/TERMINAL BODY WEIGHT) X 100.
a. Value was multiplied by 1000.

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PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 1 (PAGE 11): ORGAN WEIGHT, RATIO OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT AND RATIO OF ORGAN WEIGHT TO BRAIN WEIGHT
INDIVIDUAL AND SUMMARY DATA - MALE RATS

INDIVIDUAL ORGAN WEIGHTS AND RATIOS (%) OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT													
DOSAGE GROUP III		500 PPM											
RAT NUMBER	TERMINAL BODY WEIGHT	EPIDIDYMIDES PAIRED		TESTES PAIRED		PROSTATE		BRAIN		LIVER		KIDNEYS PAIRED	
		ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW
3801	525.	1.43	0.27	3.16	0.60	1.30	0.25	2.247	0.43	11.84	2.26	3.07	0.58
3802	590.	1.53	0.26	3.81	0.64	1.11	0.19	2.128	0.36	14.18	2.40	3.09	0.52
3803	711.	1.38	0.19	3.55	0.50	1.24	0.17	2.210	0.31	16.65	2.34	3.48	0.49
3804	648.	1.74	0.27	3.43	0.53	1.02	0.16	1.964	0.30	15.31	2.36	3.78	0.58
3805	602.	1.74	0.29	3.50	0.58	0.99	0.16	2.210	0.37	19.48	3.24	3.52	0.58
12250	522.	1.43	0.27	2.99	0.57	1.13	0.22	2.197	0.42	11.86	2.27	3.02	0.58
3807	508.	1.58	0.31	3.92	0.77	1.00	0.20	2.096	0.41	12.68	2.50	3.17	0.62
3808	615.	1.84	0.30	4.63	0.75	1.05	0.17	2.166	0.35	16.12	2.62	3.88	0.63
3809	486.	1.46	0.30	3.51	0.72	0.74	0.15	2.103	0.43	13.03	2.68	3.23	0.66
3810	594.	1.81	0.30	3.93	0.66	1.61	0.27	2.266	0.38	16.13	2.72	3.97	0.67

RAT NUMBER	TERMINAL BODY WEIGHT	ADRENALS PAIRED		SPLEEN		LUNGS		THYMUS		HEART		FIXED THYROID/ PARATHYROID	
		ABS. WT.	REL. % TBW a	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW a
3801	525.	0.047	8.95	0.97	0.18	1.79	0.34	0.46	0.09	1.60	0.30	0.03	5.71
3802	590.	0.047	7.97	1.12	0.19	1.74	0.29	0.36	0.06	1.91	0.32	0.05	8.47
3803	711.	0.080	11.25	0.78	0.11	1.91	0.27	0.34	0.05	1.65	0.23	0.04	5.62
3804	648.	0.053	8.18	0.98	0.15	1.98	0.30	0.63	0.10	1.88	0.29	0.06	9.26
3805	602.	0.060	9.97	1.03	0.17	1.88	0.31	0.40	0.07	1.76	0.29	0.05	8.30
12250	522.	0.050	9.58	0.82	0.16	1.89	0.36	0.46	0.09	1.64	0.31	0.05	9.58
3807	508.	0.062	12.20	0.83	0.16	1.67	0.33	0.24	0.05	1.64	0.32	0.03	5.90
3808	615.	0.071	11.54	1.24	0.20	1.95	0.32	0.26	0.04	1.74	0.28	0.03	4.88
3809	486.	0.054	11.11	0.88	0.18	1.73	0.36	0.30	0.06	1.55	0.32	0.06	12.34
3810	594.	0.071	11.95	0.91	0.15	2.22	0.37	0.34	0.06	1.74	0.29	0.05	8.42

ALL WEIGHTS WERE RECORDED IN GRAMS (G). ABS. WT. = ORGAN WEIGHT. REL. % TBW = (ORGAN WEIGHT/TERMINAL BODY WEIGHT) X 100.
a. Value was multiplied by 1000.

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TABLE 1 (PAGE 12): ORGAN WEIGHT, RATIO OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT AND RATIO OF ORGAN WEIGHT TO BRAIN WEIGHT
INDIVIDUAL AND SUMMARY DATA - MALE RATS

INDIVIDUAL ORGAN WEIGHTS AND RATIOS (%) OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT				
DOSAGE GROUP III		500 PPM		
RAT NUMBER	TERMINAL BODY WEIGHT	SEMINAL VESICLES/ COAGULATING GLAND		
		ABS.	REL.	
		WT.	% TBW a	
3801	525.	2.10	400.00	
3802	590.	1.82	308.47	
3803	711.	1.27	178.62	
3804	648.	1.92	296.30	
3805	602.	2.04	338.87	
12250	522.	1.42	272.03	
3807	508.	1.73	340.55	
3808	615.	2.05	333.33	
3809	486.	1.74	358.02	
3810	594.	2.66	447.81	

ALL WEIGHTS WERE RECORDED IN GRAMS (G). ABS. WT. = ORGAN WEIGHT. REL. % TBW = (ORGAN WEIGHT/TERMINAL BODY WEIGHT) X 100.
a. Value was multiplied by 1000.

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PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 1 (PAGE 13): ORGAN WEIGHT, RATIO OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT AND RATIO OF ORGAN WEIGHT TO BRAIN WEIGHT
INDIVIDUAL AND SUMMARY DATA - MALE RATS

INDIVIDUAL ORGAN WEIGHTS AND RATIOS (%) OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT													
DOSAGE GROUP IV		5000 PPM											
RAT NUMBER	TERMINAL BODY WEIGHT	EPIDIDYMIDES PAIRED		TESTES PAIRED		PROSTATE		BRAIN		LIVER		KIDNEYS PAIRED	
		ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW
3751	514.	1.35	0.26	3.61	0.70	1.02	0.20	2.144	0.42	14.11	2.74	3.14	0.61
3752	658.	1.12	0.17	3.74	0.57	0.90	0.14	2.218	0.34	19.87	3.02	3.95	0.60
3753	498.	1.53	0.31	4.28	0.86	1.18	0.24	2.231	0.45	14.87	2.98	3.08	0.62
3754	611.	1.47	0.24	3.96	0.65	0.91	0.15	2.183	0.36	19.41	3.18	3.76	0.62
3755	485.	1.40	0.29	3.84	0.79	1.29	0.26	2.052	0.42	15.38	3.17	3.32	0.68
3756	654.	1.54	0.24	3.57	0.54	1.11	0.17	2.225	0.34	20.41	3.12	2.22	0.34
3757	423.	1.31	0.31	2.64	0.62	0.94	0.22	2.131	0.50	12.58	2.97	3.33	0.79
3758	545.	1.42	0.26	3.42	0.63	1.06	0.19	2.054	0.38	16.51	3.03	3.35	0.61
3759	512.	1.55	0.30	3.76	0.73	1.23	0.24	2.148	0.42	14.34	2.80	3.38	0.66
3760	543.	1.38	0.25	3.20	0.59	0.85	0.16	2.175	0.40	15.48	2.85	3.56	0.66

RAT NUMBER	TERMINAL BODY WEIGHT	ADRENALS PAIRED		SPLEEN		LUNGS		THYMUS		HEART		FIXED THYROID/ PARATHYROID	
		ABS. WT.	REL. % TBW a	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW a
3751	514.	0.062	12.06	0.73	0.14	1.75	0.34	0.23	0.04	1.56	0.30	0.02	3.89
3752	658.	0.064	9.73	0.87	0.13	1.75	0.26	0.29	0.04	1.78	0.27	0.05	7.60
3753	498.	0.057	11.45	0.62	0.12	1.46	0.29	0.23	0.05	1.51	0.30	0.04	8.03
3754	611.	0.047	7.69	0.95	0.16	1.78	0.29	0.34	0.06	1.87	0.31	0.04	6.55
3755	485.	0.061	12.58	0.84	0.17	1.47	0.30	0.27	0.06	1.53	0.32	0.03	6.18
3756	654.	0.068	10.40	0.93	0.14	2.01	0.31	0.31	0.05	1.93	0.30	0.06	9.17
3757	423.	0.051	12.06	0.69	0.16	1.69	0.40	0.30	0.07	1.36	0.32	0.03	7.09
3758	545.	0.041	7.52	1.06	0.19	1.63	0.30	0.50	0.09	1.92	0.35	0.03	5.50
3759	512.	0.054	10.55	0.92	0.18	1.75	0.34	0.32	0.06	1.65	0.32	0.04	7.81
3760	543.	0.049	9.02	0.93	0.17	1.81	0.33	0.40	0.07	1.66	0.30	0.05	9.21

ALL WEIGHTS WERE RECORDED IN GRAMS (G). ABS. WT. = ORGAN WEIGHT. REL. % TBW = (ORGAN WEIGHT/TERMINAL BODY WEIGHT) X 100.
a. Value was multiplied by 1000.

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PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 1 (PAGE 14): ORGAN WEIGHT, RATIO OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT AND RATIO OF ORGAN WEIGHT TO BRAIN WEIGHT
INDIVIDUAL AND SUMMARY DATA - MALE RATS-----
INDIVIDUAL ORGAN WEIGHTS AND RATIOS (%) OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT
-----DOSAGE GROUP IV 5000 PPM

RAT NUMBER	TERMINAL BODY WEIGHT	SEMINAL VESICLES/ COAGULATING GLAND	
		ABS. WT.	REL. % TBW a
3751	514.	1.24	241.24
3752	658.	1.81	275.08
3753	498.	1.31	263.05
3754	611.	1.70	278.23
3755	485.	1.88	387.63
3756	654.	1.54	235.47
3757	423.	1.88	444.44
3758	545.	1.54	282.57
3759	512.	1.82	355.47
3760	543.	2.14	394.11

-----ALL WEIGHTS WERE RECORDED IN GRAMS (G). ABS. WT. = ORGAN WEIGHT. REL. % TBW = (ORGAN WEIGHT/TERMINAL BODY WEIGHT) X 100.
a. Value was multiplied by 1000.

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PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 1 (PAGE 15): ORGAN WEIGHT, RATIO OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT AND RATIO OF ORGAN WEIGHT TO BRAIN WEIGHT
INDIVIDUAL AND SUMMARY DATA - MALE RATS

INDIVIDUAL ORGAN WEIGHTS AND RATIOS (%) OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT													
DOSAGE GROUP V 10000 PPM													
RAT NUMBER	TERMINAL BODY WEIGHT	EPIDIDYMITES PAIRED		TESTES PAIRED		PROSTATE		BRAIN		LIVER		KIDNEYS PAIRED	
		ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW
3701	500.	1.48	0.30	4.20	0.84	0.86	0.17	2.220	0.44	16.20	3.24	3.78	0.76
18077	619.	1.59	0.26	4.48	0.72	0.96	0.16	2.211	0.36	23.55	3.80	5.58	0.90
3703	514.	1.30	0.25	3.63	0.71	1.02	0.20	2.063	0.40	19.74	3.84	4.64	0.90
3704	532.	1.56	0.29	3.65	0.69	1.26	0.24	2.228	0.42	18.79	3.53	4.14	0.78
3705	484.	1.35	0.28	3.82	0.79	1.01	0.21	1.984	0.41	17.17	3.55	4.01	0.83
3706	613.	1.50	0.24	4.42	0.72	1.20	0.20	2.255	0.37	25.33	4.13	5.28	0.86
3707	612.	1.33	0.22	3.68	0.60	0.85	0.14	2.022	0.33	21.42	3.50	4.34	0.71
3708	524.	1.38	0.26	3.73	0.71	0.94	0.18	2.151	0.41	16.41	3.13	3.91	0.75
3709	437.	1.48	0.34	3.65	0.84	0.72	0.16	2.186	0.50	14.64	3.35	3.00	0.69
3710	688.	1.57	0.23	4.31	0.63	1.44	0.21	2.340	0.34	26.32	3.82	5.23	0.76

RAT NUMBER	TERMINAL BODY WEIGHT	ADRENALS PAIRED		SPLEEN		LUNGS		THYMUS		HEART		FIXED THYROID/ PARATHYROID	
		ABS. WT.	REL. % TBW a	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW a
3701	500.	0.053	10.60	0.89	0.18	1.70	0.34	0.34	0.07	1.62	0.32	0.03	6.00
18077	619.	0.056	9.05	1.04	0.17	2.32	0.37	0.26	0.04	2.13	0.34	0.04	6.46
3703	514.	0.048	9.34	1.08	0.21	1.70	0.33	0.38	0.07	1.71	0.33	0.03	5.84
3704	532.	0.060	11.28	0.71	0.13	1.54	0.29	0.29	0.05	1.55	0.29	0.03	5.64
3705	484.	0.051	10.54	0.85	0.18	1.54	0.32	0.29	0.06	1.47	0.30	0.04	8.26
3706	613.	0.068	11.09	1.04	0.17	1.94	0.32	0.51	0.08	1.83	0.30	0.04	6.52
3707	612.	0.055	8.99	0.94	0.15	1.80	0.29	0.36	0.06	1.99	0.32	0.04	6.54
3708	524.	0.078	14.89	0.78	0.15	1.65	0.31	0.41	0.08	1.55	0.30	0.03	5.72
3709	437.	0.049	11.21	0.88	0.20	1.64	0.38	0.30	0.07	1.66	0.38	0.04	9.15
3710	688.	0.063	9.16	0.92	0.13	2.18	0.32	0.43	0.06	2.15	0.31	0.04	5.81

ALL WEIGHTS WERE RECORDED IN GRAMS (G). ABS. WT. = ORGAN WEIGHT. REL. % TBW = (ORGAN WEIGHT/TERMINAL BODY WEIGHT) X 100.
a. Value was multiplied by 1000.

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PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 1 (PAGE 16): ORGAN WEIGHT, RATIO OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT AND RATIO OF ORGAN WEIGHT TO BRAIN WEIGHT
INDIVIDUAL AND SUMMARY DATA - MALE RATS

INDIVIDUAL ORGAN WEIGHTS AND RATIOS (%) OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT				
DOSAGE GROUP V		10000 PPM		
RAT NUMBER	TERMINAL BODY WEIGHT	SEMINAL VESICLES/ COAGULATING GLAND		
		ABS.	REL.	
		WT.	% TBW a	
3701	500.	1.73	346.00	
18077	619.	2.20	355.41	
3703	514.	1.81	352.14	
3704	532.	1.96	368.42	
3705	484.	1.47	303.72	
3706	613.	2.04	332.79	
3707	612.	1.38	225.49	
3708	524.	1.41	269.08	
3709	437.	1.80	411.90	
3710	688.	1.85	268.90	
ALL WEIGHTS WERE RECORDED IN GRAMS (G). ABS. WT. = ORGAN WEIGHT. REL. % TBW = (ORGAN WEIGHT/TERMINAL BODY WEIGHT) X 100.				
a. Value was multiplied by 1000.				

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PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 1 (PAGE 17): ORGAN WEIGHT, RATIO OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT AND RATIO OF ORGAN WEIGHT TO BRAIN WEIGHT
INDIVIDUAL AND SUMMARY DATA - MALE RATS

INDIVIDUAL ORGAN WEIGHTS AND RATIOS (%) OF ORGAN WEIGHT TO BRAIN WEIGHT													
DOSAGE GROUP I 0 (CARRIER CONTROL) PPM													
RAT NUMBER	BRAIN WEIGHT	EPIDIDYMIDES PAIRED		TESTES PAIRED		PROSTATE		LIVER		KIDNEYS PAIRED		ADRENALS PAIRED	
		ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW
3776	2.236	1.69	75.58	3.52	157.42	1.69	75.58	13.88	620.75	3.56	159.21	0.078	3.49
3777	2.274	1.69	74.32	4.37	192.17	1.54	67.72	24.14	1061.56	4.19	184.26	0.066	2.90
3778	2.168	1.52	70.11	4.00	184.50	1.18	54.43	14.58	672.51	3.53	162.82	0.062	2.86
3779	2.195	1.58	71.98	3.71	169.02	1.17	53.30	12.13	552.62	3.00	136.67	0.050	2.28
3780	2.129	1.57	73.74	3.94	185.06	1.35	63.41	14.92	700.80	3.29	154.53	0.061	2.86
3781	2.161	1.35	62.47	3.57	165.20	1.21	55.99	15.36	710.78	3.22	149.00	0.074	3.42
3782	2.306	1.38	59.84	3.38	146.57	1.13	49.00	12.96	562.01	3.28	142.24	0.061	2.64
3783	2.252	1.88	83.48	4.03	178.95	1.49	66.16	14.52	644.76	3.83	170.07	0.076	3.37
3784	2.188	1.51	69.01	3.57	163.16	0.86	39.30	16.40	749.54	3.49	159.51	0.063	2.88
3785	2.269	1.90	83.74	3.67	161.74	1.55	68.31	17.26	760.69	4.31	189.95	0.055	2.42
RAT NUMBER	BRAIN WEIGHT	SPLEEN		LUNGS		THYMUS		HEART		FIXED THYROID/ PARATHYROID		SEMINAL VESICLES/ COAGULATING GLAND	
		ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW
3776	2.236	0.74	33.09	1.68	75.13	0.31	13.86	1.59	71.11	0.02	0.89	2.21	98.84
3777	2.274	1.02	44.85	2.12	93.23	0.44	19.35	2.12	93.23	0.05	2.20	1.62	71.24
3778	2.168	0.70	32.29	1.79	82.56	0.31	14.30	1.96	90.40	0.05	2.31	1.35	62.27
3779	2.195	0.90	41.00	1.88	85.65	0.30	13.67	1.44	65.60	0.03	1.37	1.55	70.62
3780	2.129	1.00	46.97	1.88	88.30	0.20	9.39	2.22	104.27	0.04	1.88	1.85	86.90
3781	2.161	0.63	29.15	1.92	88.85	0.29	13.42	1.55	71.73	0.02	0.92	2.08	96.25
3782	2.306	1.01	43.80	1.74	75.46	0.57	24.72	1.82	78.92	0.03	1.30	2.12	91.93
3783	2.252	1.06	47.07	2.06	91.47	0.28	12.43	1.78	79.04	0.03	1.33	2.32	103.02
3784	2.188	1.08	49.36	1.94	88.66	0.46	21.02	2.15	98.26	0.04	1.83	1.57	71.76
3785	2.269	0.97	42.75	2.24	98.72	0.34	14.98	1.90	83.74	0.04	1.76	2.14	94.31

ALL WEIGHTS WERE RECORDED IN GRAMS (G). ABS. WT. = ORGAN WEIGHT. REL. % BRW = (ORGAN WEIGHT/BRAIN WEIGHT) X 100.

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PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 1 (PAGE 18): ORGAN WEIGHT, RATIO OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT AND RATIO OF ORGAN WEIGHT TO BRAIN WEIGHT
INDIVIDUAL AND SUMMARY DATA - MALE RATS

INDIVIDUAL ORGAN WEIGHTS AND RATIOS (%) OF ORGAN WEIGHT TO BRAIN WEIGHT													
DOSAGE GROUP II 100 PPM													
RAT NUMBER	BRAIN WEIGHT	EPIDIDYMIDES PAIRED		TESTES PAIRED		PROSTATE		LIVER		KIDNEYS PAIRED		ADRENALS PAIRED	
		ABS.	REL.	ABS.	REL.	ABS.	REL.	ABS.	REL.	ABS.	REL.	ABS.	REL.
		WT.	% BRW	WT.	% BRW	WT.	% BRW	WT.	% BRW	WT.	% BRW	WT.	% BRW
3726	2.198	1.54	70.06	3.83	174.25	1.46	66.42	12.12	551.41	3.09	140.58	0.058	2.64
3727	2.348	1.67	71.12	3.92	166.95	1.27	54.09	13.31	566.86	3.49	148.64	0.070	2.98
3728	2.224	1.53	68.79	4.21	189.30	1.48	66.55	16.90	759.89	3.98	178.96	0.087	3.91
3729	2.312	1.73	74.83	4.12	178.20	1.35	58.39	15.58	673.88	3.78	163.49	0.063	2.72
3730	2.054	1.47	71.57	3.57	173.81	1.25	60.86	11.94	581.30	2.84	138.27	0.066	3.21
3731	2.336	1.58	67.64	3.61	154.54	1.28	54.79	15.12	647.26	3.70	158.39	0.060	2.57
3732	2.215	1.49	67.27	3.72	167.94	1.25	56.43	14.65	661.40	3.28	148.08	0.057	2.57
3733	2.200	1.65	75.00	4.18	190.00	1.10	50.00	15.31	695.91	2.84	129.09	0.074	3.36
3734	2.245	1.76	78.40	4.04	179.96	1.67	74.39	14.43	642.76	3.58	159.46	0.069	3.07
3735	2.307	1.63	70.65	3.84	166.45	1.03	44.65	15.56	674.47	3.60	156.05	0.062	2.69
RAT NUMBER	BRAIN WEIGHT	SPLEEN		LUNGS		THYMUS		HEART		FIXED THYROID/ PARATHYROID		SEMINAL VESICLES/ COAGULATING GLAND	
		ABS.	REL.	ABS.	REL.	ABS.	REL.	ABS.	REL.	ABS.	REL.	ABS.	REL.
		WT.	% BRW	WT.	% BRW	WT.	% BRW	WT.	% BRW	WT.	% BRW	WT.	% BRW
3726	2.198	0.97	44.13	1.78	80.98	0.44	20.02	1.68	76.43	0.03	1.36	2.61	118.74
3727	2.348	0.81	34.50	1.68	71.55	0.24	10.22	1.81	77.09	0.04	1.70	1.54	65.59
3728	2.224	1.22	54.86	2.36	106.12	0.38	17.09	2.13	95.77	0.03	1.35	2.41	108.36
3729	2.312	1.01	43.68	2.07	89.53	0.37	16.00	1.80	77.85	0.05	2.16	2.04	88.24
3730	2.054	0.87	42.36	1.57	76.44	0.32	15.58	1.50	73.03	0.03	1.46	2.02	98.34
3731	2.336	1.22	52.23	1.71	73.20	0.42	17.98	1.88	80.48	0.03	1.28	1.78	76.20
3732	2.215	0.76	34.31	1.78	80.36	0.40	18.06	1.86	83.97	0.04	1.80	2.13	96.16
3733	2.200	1.20	54.54	1.80	81.82	0.31	14.09	1.71	77.73	0.02	0.91	1.92	87.27
3734	2.245	1.02	45.43	1.98	88.20	0.29	12.92	1.68	74.83	0.04	1.78	2.12	94.43
3735	2.307	1.04	45.08	1.69	73.26	0.28	12.14	1.89	81.92	0.03	1.30	1.15	49.85

ALL WEIGHTS WERE RECORDED IN GRAMS (G). ABS. WT. = ORGAN WEIGHT. REL. % BRW = (ORGAN WEIGHT/BRAIN WEIGHT) X 100.

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PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 1 (PAGE 19): ORGAN WEIGHT, RATIO OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT AND RATIO OF ORGAN WEIGHT TO BRAIN WEIGHT
INDIVIDUAL AND SUMMARY DATA - MALE RATS

INDIVIDUAL ORGAN WEIGHTS AND RATIOS (%) OF ORGAN WEIGHT TO BRAIN WEIGHT													
DOSAGE GROUP III		500 PPM											
RAT NUMBER	BRAIN WEIGHT	EPIDIDYMIDES PAIRED		TESTES PAIRED		PROSTATE		LIVER		KIDNEYS PAIRED		ADRENALS PAIRED	
		ABS.	REL.	ABS.	REL.	ABS.	REL.	ABS.	REL.	ABS.	REL.	ABS.	REL.
		WT.	% BRW	WT.	% BRW	WT.	% BRW	WT.	% BRW	WT.	% BRW	WT.	% BRW
3801	2.247	1.43	63.64	3.16	140.63	1.30	57.85	11.84	526.92	3.07	136.63	0.047	2.09
3802	2.128	1.53	71.90	3.81	179.04	1.11	52.16	14.18	666.35	3.09	145.21	0.047	2.21
3803	2.210	1.38	62.44	3.55	160.63	1.24	56.11	16.65	753.39	3.48	157.47	0.080	3.62
3804	1.964	1.74	88.59	3.43	174.64	1.02	51.93	15.31	779.53	3.78	192.46	0.053	2.70
3805	2.210	1.74	78.73	3.50	158.37	0.99	44.80	19.48	881.45	3.52	159.28	0.060	2.71
12250	2.197	1.43	65.09	2.99	136.09	1.13	51.43	11.86	539.83	3.02	137.46	0.050	2.28
3807	2.096	1.58	75.38	3.92	187.02	1.00	47.71	12.68	604.96	3.17	151.24	0.062	2.96
3808	2.166	1.84	84.95	4.63	213.76	1.05	48.48	16.12	744.23	3.88	179.13	0.071	3.28
3809	2.103	1.46	69.42	3.51	166.90	0.74	35.19	13.03	619.59	3.23	153.59	0.054	2.57
3810	2.266	1.81	79.88	3.93	173.43	1.61	71.05	16.13	711.83	3.97	175.20	0.071	3.13
RAT NUMBER	BRAIN WEIGHT	SPLEEN		LUNGS		THYMUS		HEART		FIXED THYROID/ PARATHYROID		SEMINAL VESICLES/ COAGULATING GLAND	
		ABS.	REL.	ABS.	REL.	ABS.	REL.	ABS.	REL.	ABS.	REL.	ABS.	REL.
		WT.	% BRW	WT.	% BRW	WT.	% BRW	WT.	% BRW	WT.	% BRW	WT.	% BRW
3801	2.247	0.97	43.17	1.79	79.66	0.46	20.47	1.60	71.21	0.03	1.34	2.10	93.46
3802	2.128	1.12	52.63	1.74	81.77	0.36	16.92	1.91	89.76	0.05	2.35	1.82	85.53
3803	2.210	0.78	35.29	1.91	86.42	0.34	15.38	1.65	74.66	0.04	1.81	1.27	57.47
3804	1.964	0.98	49.90	1.98	100.81	0.63	32.08	1.88	95.72	0.06	3.05	1.92	97.76
3805	2.210	1.03	46.61	1.88	85.07	0.40	18.10	1.76	79.64	0.05	2.26	2.04	92.31
12250	2.197	0.82	37.32	1.89	86.03	0.46	20.94	1.64	74.65	0.05	2.28	1.42	64.63
3807	2.096	0.83	39.60	1.67	79.68	0.24	11.45	1.64	78.24	0.03	1.43	1.73	82.54
3808	2.166	1.24	57.25	1.95	90.03	0.26	12.00	1.74	80.33	0.03	1.38	2.05	94.64
3809	2.103	0.88	41.84	1.73	82.26	0.30	14.26	1.55	73.70	0.06	2.85	1.74	82.74
3810	2.266	0.91	40.16	2.22	97.97	0.34	15.00	1.74	76.79	0.05	2.21	2.66	117.39

ALL WEIGHTS WERE RECORDED IN GRAMS (G). ABS. WT. = ORGAN WEIGHT. REL. % BRW = (ORGAN WEIGHT/BRAIN WEIGHT) X 100.

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PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 1 (PAGE 20): ORGAN WEIGHT, RATIO OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT AND RATIO OF ORGAN WEIGHT TO BRAIN WEIGHT
INDIVIDUAL AND SUMMARY DATA - MALE RATS

INDIVIDUAL ORGAN WEIGHTS AND RATIOS (%) OF ORGAN WEIGHT TO BRAIN WEIGHT													
DOSAGE GROUP IV		5000 PPM											
RAT NUMBER	BRAIN WEIGHT	EPIDIDYMIDES PAIRED		TESTES PAIRED		PROSTATE		LIVER		KIDNEYS PAIRED		ADRENALS PAIRED	
		ABS.	REL.	ABS.	REL.	ABS.	REL.	ABS.	REL.	ABS.	REL.	ABS.	REL.
		WT.	% BRW	WT.	% BRW	WT.	% BRW	WT.	% BRW	WT.	% BRW	WT.	% BRW
3751	2.144	1.35	62.97	3.61	168.38	1.02	47.57	14.11	658.12	3.14	146.46	0.062	2.89
3752	2.218	1.12	50.50	3.74	168.62	0.90	40.58	19.87	895.85	3.95	178.09	0.064	2.88
3753	2.231	1.53	68.58	4.28	191.84	1.18	52.89	14.87	666.52	3.08	138.05	0.057	2.55
3754	2.183	1.47	67.34	3.96	181.40	0.91	41.68	19.41	889.14	3.76	172.24	0.047	2.15
3755	2.052	1.40	68.23	3.84	187.13	1.29	62.86	15.38	749.51	3.32	161.79	0.061	2.97
3756	2.225	1.54	69.21	3.57	160.45	1.11	49.89	20.41	917.30	2.22	99.78	0.068	3.06
3757	2.131	1.31	61.47	2.64	123.88	0.94	44.11	12.58	590.33	3.33	156.26	0.051	2.39
3758	2.054	1.42	69.13	3.42	166.50	1.06	51.61	16.51	803.80	3.35	163.10	0.041	2.00
3759	2.148	1.55	72.16	3.76	175.05	1.23	57.26	14.34	667.60	3.38	157.36	0.054	2.51
3760	2.175	1.38	63.45	3.20	147.13	0.85	39.08	15.48	711.72	3.56	163.68	0.049	2.25
RAT NUMBER	BRAIN WEIGHT	SPLEEN		LUNGS		THYMUS		HEART		FIXED THYROID/ PARATHYROID		SEMINAL VESICLES/ COAGULATING GLAND	
		ABS.	REL.	ABS.	REL.	ABS.	REL.	ABS.	REL.	ABS.	REL.	ABS.	REL.
		WT.	% BRW	WT.	% BRW	WT.	% BRW	WT.	% BRW	WT.	% BRW	WT.	% BRW
3751	2.144	0.73	34.05	1.75	81.62	0.23	10.73	1.56	72.76	0.02	0.93	1.24	57.84
3752	2.218	0.87	39.22	1.75	78.90	0.29	13.07	1.78	80.25	0.05	2.25	1.81	81.60
3753	2.231	0.62	27.79	1.46	65.44	0.23	10.31	1.51	67.68	0.04	1.79	1.31	58.72
3754	2.183	0.95	43.52	1.78	81.54	0.34	15.57	1.87	85.66	0.04	1.83	1.70	77.87
3755	2.052	0.84	40.94	1.47	71.64	0.27	13.16	1.53	74.56	0.03	1.46	1.88	91.62
3756	2.225	0.93	41.80	2.01	90.34	0.31	13.93	1.93	86.74	0.06	2.70	1.54	69.21
3757	2.131	0.69	32.38	1.69	79.30	0.30	14.08	1.36	63.82	0.03	1.41	1.88	88.22
3758	2.054	1.06	51.61	1.63	79.36	0.50	24.34	1.92	93.48	0.03	1.46	1.54	74.98
3759	2.148	0.92	42.83	1.75	81.47	0.32	14.90	1.65	76.82	0.04	1.86	1.82	84.73
3760	2.175	0.93	42.76	1.81	83.22	0.40	18.39	1.66	76.32	0.05	2.30	2.14	98.39

ALL WEIGHTS WERE RECORDED IN GRAMS (G). ABS. WT. = ORGAN WEIGHT. REL. % BRW = (ORGAN WEIGHT/BRAIN WEIGHT) X 100.

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PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 1 (PAGE 21): ORGAN WEIGHT, RATIO OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT AND RATIO OF ORGAN WEIGHT TO BRAIN WEIGHT
INDIVIDUAL AND SUMMARY DATA - MALE RATS

INDIVIDUAL ORGAN WEIGHTS AND RATIOS (%) OF ORGAN WEIGHT TO BRAIN WEIGHT													
DOSAGE GROUP V 10000 PPM													
RAT NUMBER	BRAIN WEIGHT	EPIDIDYMIDES PAIRED		TESTES PAIRED		PROSTATE		LIVER		KIDNEYS PAIRED		ADRENALS PAIRED	
		ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW
3701	2.220	1.48	66.67	4.20	189.19	0.86	38.74	16.20	729.73	3.78	170.27	0.053	2.39
18077	2.211	1.59	71.91	4.48	202.62	0.96	43.42	23.55	1065.13	5.58	252.37	0.056	2.53
3703	2.063	1.30	63.02	3.63	175.96	1.02	49.44	19.74	956.86	4.64	224.92	0.048	2.33
3704	2.228	1.56	70.02	3.65	163.82	1.26	56.55	18.79	843.36	4.14	185.82	0.060	2.69
3705	1.984	1.35	68.04	3.82	192.54	1.01	50.91	17.17	865.42	4.01	202.12	0.051	2.57
3706	2.255	1.50	66.52	4.42	196.01	1.20	53.22	25.33	1123.28	5.28	234.15	0.068	3.02
3707	2.022	1.33	65.78	3.68	182.00	0.85	42.04	21.42	1059.35	4.34	214.64	0.055	2.72
3708	2.151	1.38	64.16	3.73	173.41	0.94	43.70	16.41	762.90	3.91	181.78	0.078	3.63
3709	2.186	1.48	67.70	3.65	166.97	0.72	32.94	14.64	669.72	3.00	137.24	0.049	2.24
3710	2.340	1.57	67.09	4.31	184.19	1.44	61.54	26.32	1124.79	5.23	223.50	0.063	2.69
RAT NUMBER	BRAIN WEIGHT	SPLEEN		LUNGS		THYMUS		HEART		FIXED THYROID/ PARATHYROID		SEMINAL VESICLES/ COAGULATING GLAND	
		ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW
3701	2.220	0.89	40.09	1.70	76.58	0.34	15.32	1.62	72.97	0.03	1.35	1.73	77.93
18077	2.211	1.04	47.04	2.32	104.93	0.26	11.76	2.13	96.34	0.04	1.81	2.20	99.50
3703	2.063	1.08	52.35	1.70	82.40	0.38	18.42	1.71	82.89	0.03	1.45	1.81	87.74
3704	2.228	0.71	31.87	1.54	69.12	0.29	13.02	1.55	69.57	0.03	1.35	1.96	87.97
3705	1.984	0.85	42.84	1.54	77.62	0.29	14.62	1.47	74.09	0.04	2.02	1.47	74.09
3706	2.255	1.04	46.12	1.94	86.03	0.51	22.62	1.83	81.15	0.04	1.77	2.04	90.46
3707	2.022	0.94	46.49	1.80	89.02	0.36	17.80	1.99	98.42	0.04	1.98	1.38	68.25
3708	2.151	0.78	36.26	1.65	76.71	0.41	19.06	1.55	72.06	0.03	1.39	1.41	65.55
3709	2.186	0.88	40.26	1.64	75.02	0.30	13.72	1.66	75.94	0.04	1.83	1.80	82.34
3710	2.340	0.92	39.32	2.18	93.16	0.43	18.38	2.15	91.88	0.04	1.71	1.85	79.06

ALL WEIGHTS WERE RECORDED IN GRAMS (G). ABS. WT. = ORGAN WEIGHT. REL. % BRW = (ORGAN WEIGHT/BRAIN WEIGHT) X 100.

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PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 1 (PAGE 22): ORGAN WEIGHT, RATIO OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT AND RATIO OF ORGAN WEIGHT TO BRAIN WEIGHT
INDIVIDUAL AND SUMMARY DATA - FEMALE RATS

INDIVIDUAL ORGAN WEIGHTS AND RATIOS (%) OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT													
DOSAGE GROUP I 0 (CARRIER CONTROL) PPM													
RAT NUMBER	TERMINAL BODY WEIGHT	BRAIN		LIVER		KIDNEYS PAIRED		ADRENALS PAIRED		SPLEEN		LUNGS	
		ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW a	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW
3901	353.	1.844	0.52	8.96	2.54	2.05	0.58	0.051	14.45	0.62	0.18	1.32	0.37
3902	393.	2.094	0.53	7.88	2.00	2.06	0.52	0.057	14.50	0.64	0.16	1.31	0.33
3903	285.	2.059	0.72	7.24	2.54	1.83	0.64	0.080	28.07	0.54	0.19	1.48	0.52
3904	327.	1.956	0.60	7.91	2.42	1.83	0.56	0.063	19.27	0.60	0.18	1.27	0.39
3905	272.	2.024	0.74	6.29	2.31	1.80	0.66	0.053	19.49	0.57	0.21	1.11	0.41
3906	460.	2.070	0.45	11.01	2.39	2.43	0.53	0.074	16.09	0.96	0.21	1.46	0.32
3907	378.	2.018	0.53	7.94	2.10	1.75	0.46	0.049	12.96	0.57	0.15	1.21	0.32
3908	283.	2.033	0.72	6.95	2.46	1.88	0.66	0.088	31.10	0.61	0.22	1.40	0.49
3909	370.	2.054	0.56	8.58	2.32	2.02	0.54	0.067	18.11	0.83	0.22	1.38	0.37
3910	394.	2.148	0.54	9.48	2.41	2.32	0.59	0.088	22.34	0.92	0.23	1.64	0.42
RAT NUMBER	TERMINAL BODY WEIGHT	THYMUS		OVARIES PAIRED		UTERUS NON- GRAVID W/ CERVIX		HEART		FIXED THYROID/ PARATHYROID			
		ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW a		
3901	353.	0.34	0.10	0.061	0.02	0.65	0.18	1.06	0.30	0.03	8.50		
3902	393.	0.49	0.12	0.103	0.03	1.02	0.26	1.16	0.30	0.02	5.09		
3903	285.	0.22	0.08	0.102	0.04	0.58	0.20	1.14	0.40	0.02	7.02		
3904	327.	0.46	0.14	0.098	0.03	0.65	0.20	0.99	0.30	0.03	9.17		
3905	272.	0.29	0.11	0.081	0.03	0.54	0.20	0.94	0.34	0.02	7.35		
3906	460.	0.38	0.08	0.124	0.03	0.73	0.16	1.30	0.28	0.04	8.70		
3907	378.	0.35	0.09	0.087	0.02	0.52	0.14	1.19	0.31	0.02	5.29		
3908	283.	0.37	0.13	0.076	0.03	1.27	0.45	1.12	0.40	0.03	10.60		
3909	370.	0.39	0.10	0.080	0.02	0.56	0.15	1.63	0.44	0.02	5.40		
3910	394.	0.39	0.10	0.131	0.03	0.82	0.21	1.41	0.36	0.02	5.08		

ALL WEIGHTS WERE RECORDED IN GRAMS (G). ABS. WT. = ORGAN WEIGHT. REL. % TBW = (ORGAN WEIGHT/TERMINAL BODY WEIGHT) X 100.
a. Value was multiplied by 1000.

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PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 1 (PAGE 23): ORGAN WEIGHT, RATIO OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT AND RATIO OF ORGAN WEIGHT TO BRAIN WEIGHT
INDIVIDUAL AND SUMMARY DATA - FEMALE RATS

INDIVIDUAL ORGAN WEIGHTS AND RATIOS (%) OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT													
DOSAGE GROUP II 100 PPM													
RAT NUMBER	TERMINAL BODY WEIGHT	BRAIN		LIVER		KIDNEYS PAIRED		ADRENALS PAIRED		SPLEEN		LUNGS	
		ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW a	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW
3851	316.	1.976	0.62	7.05	2.23	1.93	0.61	0.055	17.41	0.52	0.16	1.39	0.44
3852	358.	2.064	0.58	7.58	2.12	2.06	0.58	0.071	19.83	0.54	0.15	1.50	0.42
3853	291.	2.118	0.73	7.52	2.58	2.01	0.69	0.061	20.96	0.55	0.19	1.28	0.44
3854	308.	2.005	0.65	7.59	2.46	1.97	0.64	0.076	24.68	0.68	0.22	1.42	0.46
3855	391.	1.947	0.50	9.66	2.47	2.20	0.56	0.073	18.67	0.72	0.18	1.38	0.35
3856	328.	2.154	0.66	7.56	2.30	2.28	0.70	0.052	15.85	0.82	0.25	1.31	0.40
3857	294.	2.006	0.68	7.22	2.46	1.80	0.61	0.084	28.57	0.53	0.18	1.39	0.47
3858	313.	1.975	0.63	7.35	2.35	2.12	0.68	0.059	18.85	0.75	0.24	1.19	0.38
3859	272.	2.058	0.76	6.44	2.37	1.95	0.72	0.047	17.28	0.58	0.21	1.16	0.43
3860	355.	1.984	0.56	8.54	2.40	1.99	0.56	0.067	18.87	0.74	0.21	1.50	0.42

RAT NUMBER	TERMINAL BODY WEIGHT	THYMUS		OVARIES PAIRED		UTERUS NON- GRAVID W/ CERVIX		HEART		FIXED THYROID/ PARATHYROID	
		ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW a
3851	316.	0.41	0.13	0.092	0.03	0.48	0.15	1.07	0.34	0.04	12.66
3852	358.	0.27	0.08	0.127	0.04	0.65	0.18	1.08	0.30	0.02	5.59
3853	291.	0.31	0.11	0.107	0.04	0.60	0.21	1.42	0.49	0.06	20.62
3854	308.	0.31	0.10	0.116	0.04	0.47	0.15	1.06	0.34	0.04	12.99
3855	391.	0.38	0.10	0.104	0.03	0.51	0.13	1.36	0.35	0.04	10.23
3856	328.	0.28	0.08	0.070	0.02	1.05	0.32	1.08	0.33	0.03	9.15
3857	294.	0.27	0.09	0.082	0.03	0.79	0.27	0.99	0.34	0.04	13.60
3858	313.	0.24	0.08	0.097	0.03	0.89	0.28	1.22	0.39	0.03	9.58
3859	272.	0.35	0.13	0.086	0.03	0.57	0.21	0.99	0.36	0.03	11.03
3860	355.	0.53	0.15	0.126	0.04	0.70	0.20	1.12	0.32	0.03	8.45

ALL WEIGHTS WERE RECORDED IN GRAMS (G). ABS. WT. = ORGAN WEIGHT. REL. % TBW = (ORGAN WEIGHT/TERMINAL BODY WEIGHT) X 100.
a. Value was multiplied by 1000.

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PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 1 (PAGE 24): ORGAN WEIGHT, RATIO OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT AND RATIO OF ORGAN WEIGHT TO BRAIN WEIGHT
INDIVIDUAL AND SUMMARY DATA - FEMALE RATS

INDIVIDUAL ORGAN WEIGHTS AND RATIOS (%) OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT													
DOSAGE GROUP III 500 PPM													
RAT NUMBER	TERMINAL BODY WEIGHT	BRAIN		LIVER		KIDNEYS PAIRED		ADRENALS PAIRED		SPLEEN		LUNGS	
		ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW a	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW
3926	288.	1.984	0.69	6.72	2.33	1.94	0.67	0.057	19.79	0.54	0.19	1.17	0.41
3927	362.	2.078	0.57	7.67	2.12	1.86	0.51	0.057	15.75	0.76	0.21	1.45	0.40
3928	292.	2.010	0.69	7.37	2.52	1.90	0.65	0.064	21.92	0.63	0.22	1.38	0.47
3929	268.	1.909	0.71	7.09	2.64	2.07	0.77	0.066	24.63	0.58	0.22	1.28	0.48
3930	327.	2.226	0.68	7.63	2.33	2.19	0.67	0.069	21.10	0.60	0.18	1.34	0.41
3931	360.	2.096	0.58	7.49	2.08	1.88	0.52	0.057	15.83	0.61	0.17	1.34	0.37
3932	343.	1.978	0.58	8.30	2.42	1.75	0.51	0.095	27.70	0.69	0.20	1.39	0.40
3933	316.	2.011	0.64	7.59	2.40	1.91	0.60	0.062	19.62	0.59	0.19	1.21	0.38
3934	299.	1.935	0.65	7.89	2.64	2.24	0.75	0.066	22.07	0.66	0.22	1.37	0.46
3935	393.	2.103	0.54	11.32	2.88	2.67	0.68	0.082	20.87	0.66	0.17	1.48	0.38

RAT NUMBER	TERMINAL BODY WEIGHT	THYMUS		OVARIES PAIRED		UTERUS NON- GRAVID W/ CERVIX		HEART		FIXED THYROID/ PARATHYROID	
		ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW a
3926	288.	0.32	0.11	0.111	0.04	0.97	0.34	0.90	0.31	0.03	10.42
3927	362.	0.34	0.09	0.094	0.02	0.60	0.16	1.15	0.32	0.03	8.29
3928	292.	0.27	0.09	0.114	0.04	0.52	0.18	1.10	0.38	0.03	10.27
3929	268.	0.23	0.08	0.076	0.03	1.33	0.50	0.97	0.36	0.02	7.46
3930	327.	0.37	0.11	0.089	0.03	0.95	0.29	1.09	0.33	0.03	9.17
3931	360.	0.41	0.11	0.096	0.03	0.75	0.21	1.09	0.30	0.04	11.11
3932	343.	0.43	0.12	0.115	0.03	0.72	0.21	1.09	0.32	0.05	14.58
3933	316.	0.34	0.11	0.074	0.02	0.96	0.30	1.00	0.32	0.04	12.66
3934	299.	0.24	0.08	0.094	0.03	1.04	0.35	1.08	0.36	0.04	13.38
3935	393.	0.28	0.07	0.125	0.03	0.59	0.15	1.46	0.37	0.04	10.18

ALL WEIGHTS WERE RECORDED IN GRAMS (G). ABS. WT. = ORGAN WEIGHT. REL. % TBW = (ORGAN WEIGHT/TERMINAL BODY WEIGHT) X 100.
a. Value was multiplied by 1000.

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PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 1 (PAGE 25): ORGAN WEIGHT, RATIO OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT AND RATIO OF ORGAN WEIGHT TO BRAIN WEIGHT
INDIVIDUAL AND SUMMARY DATA - FEMALE RATS

INDIVIDUAL ORGAN WEIGHTS AND RATIOS (%) OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT													
DOSAGE GROUP IV		5000 PPM											
RAT NUMBER	TERMINAL BODY WEIGHT	BRAIN		LIVER		KIDNEYS PAIRED		ADRENALS PAIRED		SPLEEN		LUNGS	
		ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW a	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW
3951	313.	1.998	0.64	8.89	2.84	2.20	0.70	0.059	18.85	0.93	0.30	1.34	0.43
3952	344.	2.101	0.61	8.28	2.41	2.14	0.62	0.057	16.57	0.69	0.20	1.40	0.41
3953	315.	1.978	0.63	8.38	2.66	2.16	0.68	0.065	20.63	0.66	0.21	1.31	0.42
3954	467.	1.973	0.42	12.21	2.61	2.76	0.59	0.065	13.92	0.69	0.15	1.35	0.29
3955	294.	2.059	0.70	7.24	2.46	1.78	0.60	0.065	22.11	0.59	0.20	1.16	0.39
3956	386.	1.940	0.50	9.51	2.46	2.48	0.64	0.054	13.99	0.56	0.14	1.32	0.34
3957	397.	2.045	0.52	9.07	2.28	2.29	0.58	0.061	15.37	0.77	0.19	1.40	0.35
3958	326.	2.026	0.62	7.39	2.27	2.04	0.62	0.063	19.33	0.46	0.14	1.28	0.39
3959	330.	2.010	0.61	7.86	2.38	2.20	0.67	0.058	17.58	0.70	0.21	1.38	0.42
3960	326.	2.063	0.63	8.38	2.57	2.27	0.70	0.059	18.10	0.48	0.15	1.32	0.40
RAT NUMBER	TERMINAL BODY WEIGHT	THYMUS		OVARIES PAIRED		UTERUS NON- GRAVID W/ CERVIX		HEART		FIXED THYROID/ PARATHYROID			
		ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW a		
3951	313.	0.29	0.09	0.125	0.04	1.60	0.51	1.11	0.35	0.04	12.78		
3952	344.	0.42	0.12	0.106	0.03	0.77	0.22	0.99	0.29	0.06	17.44		
3953	315.	0.42	0.13	0.091	0.03	0.74	0.23	1.02	0.32	0.03	9.52		
3954	467.	0.49	0.10	0.092	0.02	0.66	0.14	1.25	0.27	0.04	8.56		
3955	294.	0.40	0.14	0.106	0.04	0.72	0.24	0.96	0.33	0.02	6.80		
3956	386.	0.29	0.08	0.094	0.02	1.01	0.26	1.28	0.33	0.02	5.18		
3957	397.	0.38	0.10	0.102	0.02	0.54	0.14	1.06	0.27	0.02	5.04		
3958	326.	0.22	0.07	0.104	0.03	0.62	0.19	0.99	0.30	0.02	6.13		
3959	330.	0.30	0.09	0.091	0.03	0.71	0.22	1.14	0.34	0.02	6.06		
3960	326.	0.34	0.10	0.099	0.03	0.64	0.20	1.19	0.36	0.02	6.13		

ALL WEIGHTS WERE RECORDED IN GRAMS (G). ABS. WT. = ORGAN WEIGHT. REL. % TBW = (ORGAN WEIGHT/TERMINAL BODY WEIGHT) X 100.
a. Value was multiplied by 1000.

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PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 1 (PAGE 26): ORGAN WEIGHT, RATIO OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT AND RATIO OF ORGAN WEIGHT TO BRAIN WEIGHT
INDIVIDUAL AND SUMMARY DATA - FEMALE RATS

INDIVIDUAL ORGAN WEIGHTS AND RATIOS (%) OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT													
DOSAGE GROUP V 10000 PPM													
RAT NUMBER	TERMINAL BODY WEIGHT	BRAIN		LIVER		KIDNEYS PAIRED		ADRENALS PAIRED		SPLEEN		LUNGS	
		ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW a	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW
3876	265.	2.010	0.76	7.78	2.94	1.96	0.74	0.046	17.36	0.48	0.18	1.18	0.44
3877	350.	2.205	0.63	9.66	2.76	2.34	0.67	0.055	15.71	0.69	0.20	1.31	0.37
3878	285.	2.169	0.76	7.76	2.72	1.78	0.62	0.073	25.61	0.50	0.18	1.16	0.41
3879	295.	1.944	0.66	8.43	2.86	2.43	0.82	0.044	14.92	0.66	0.22	1.18	0.40
3880	267.	1.971	0.74	10.66	3.99	2.50	0.94	0.135	50.56	0.63	0.24	1.18	0.44
3881	304.	2.093	0.69	9.96	3.28	2.21	0.73	0.072	23.68	0.46	0.15	1.25	0.41
3882	237.	2.067	0.87	6.49	2.74	1.82	0.77	0.055	23.21	0.52	0.22	1.16	0.49
3883	369.	1.926	0.52	10.44	2.83	2.30	0.62	0.066	17.89	0.62	0.17	1.24	0.34
3884	270.	2.074	0.77	8.52	3.16	2.04	0.76	0.064	23.70	0.55	0.20	1.29	0.48
3885	318.	2.183	0.69	9.58	3.01	2.29	0.72	0.082	25.79	0.61	0.19	1.47	0.46

RAT NUMBER	TERMINAL BODY WEIGHT	THYMUS		OVARIES PAIRED		UTERUS NON- GRAVID W/ CERVIX		HEART		FIXED THYROID/ PARATHYROID	
		ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW	ABS. WT.	REL. % TBW a
3876	265.	0.26	0.10	0.078	0.03	0.42	0.16	1.06	0.40	0.02	7.55
3877	350.	0.30	0.08	0.110	0.03	0.53	0.15	1.08	0.31	0.02	5.71
3878	285.	0.24	0.08	0.094	0.03	0.63	0.22	0.96	0.34	0.02	7.02
3879	295.	0.49	0.17	0.096	0.03	1.58	0.54	0.99	0.34	0.02	6.78
3880	267.	0.39	0.15	0.045	0.02	0.62	0.23	1.22	0.46	0.05	18.73
3881	304.	0.27	0.09	0.070	0.02	0.70	0.23	1.11	0.36	0.02	6.58
3882	237.	0.33	0.14	0.074	0.03	0.50	0.21	1.00	0.42	0.02	8.44
3883	369.	0.31	0.08	0.108	0.03	0.67	0.18	1.05	0.28	0.03	8.13
3884	270.	0.35	0.13	0.086	0.03	0.52	0.19	0.96	0.36	0.03	11.11
3885	318.	0.31	0.10	0.126	0.04	0.80	0.25	1.05	0.33	0.03	9.43

ALL WEIGHTS WERE RECORDED IN GRAMS (G). ABS. WT. = ORGAN WEIGHT. REL. % TBW = (ORGAN WEIGHT/TERMINAL BODY WEIGHT) X 100.
a. Value was multiplied by 1000.

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TABLE 1 (PAGE 27): ORGAN WEIGHT, RATIO OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT AND RATIO OF ORGAN WEIGHT TO BRAIN WEIGHT
INDIVIDUAL AND SUMMARY DATA - FEMALE RATS

INDIVIDUAL ORGAN WEIGHTS AND RATIOS (%) OF ORGAN WEIGHT TO BRAIN WEIGHT													
DOSAGE GROUP I		0 (CARRIER CONTROL) PPM											
RAT NUMBER	BRAIN WEIGHT	LIVER		KIDNEYS PAIRED		ADRENALS PAIRED		SPLEEN		LUNGS		THYMUS	
		ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW
3901	1.844	8.96	485.90	2.05	111.17	0.051	2.76	0.62	33.62	1.32	71.58	0.34	18.44
3902	2.094	7.88	376.31	2.06	98.38	0.057	2.72	0.64	30.56	1.31	62.56	0.49	23.40
3903	2.059	7.24	351.63	1.83	88.88	0.080	3.88	0.54	26.23	1.48	71.88	0.22	10.68
3904	1.956	7.91	404.40	1.83	93.56	0.063	3.22	0.60	30.67	1.27	64.93	0.46	23.52
3905	2.024	6.29	310.77	1.80	88.93	0.053	2.62	0.57	28.16	1.11	54.84	0.29	14.33
3906	2.070	11.01	531.88	2.43	117.39	0.074	3.57	0.96	46.38	1.46	70.53	0.38	18.36
3907	2.018	7.94	393.46	1.75	86.72	0.049	2.43	0.57	28.24	1.21	59.96	0.35	17.34
3908	2.033	6.95	341.86	1.88	92.47	0.088	4.33	0.61	30.00	1.40	68.86	0.37	18.20
3909	2.054	8.58	417.72	2.02	98.34	0.067	3.26	0.83	40.41	1.38	67.18	0.39	18.99
3910	2.148	9.48	441.34	2.32	108.01	0.088	4.10	0.92	42.83	1.64	76.35	0.39	18.16
RAT NUMBER	BRAIN WEIGHT	OVARIES PAIRED		UTERUS NON- GRAVID W/ CERVIX		HEART		FIXED THYROID/ PARATHYROID					
		ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW				
3901	1.844	0.061	3.31	0.65	35.25	1.06	57.48	0.03	1.63				
3902	2.094	0.103	4.92	1.02	48.71	1.16	55.40	0.02	0.96				
3903	2.059	0.102	4.95	0.58	28.17	1.14	55.37	0.02	0.97				
3904	1.956	0.098	5.01	0.65	33.23	0.99	50.61	0.03	1.53				
3905	2.024	0.081	4.00	0.54	26.68	0.94	46.44	0.02	0.99				
3906	2.070	0.124	5.99	0.73	35.26	1.30	62.80	0.04	1.93				
3907	2.018	0.087	4.31	0.52	25.77	1.19	58.97	0.02	0.99				
3908	2.033	0.076	3.74	1.27	62.47	1.12	55.09	0.03	1.48				
3909	2.054	0.080	3.89	0.56	27.26	1.63	79.36	0.02	0.97				
3910	2.148	0.131	6.10	0.82	38.18	1.41	65.64	0.02	0.93				

ALL WEIGHTS WERE RECORDED IN GRAMS (G). ABS. WT. = ORGAN WEIGHT. REL. % BRW = (ORGAN WEIGHT/BRAIN WEIGHT) X 100.

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TABLE 1 (PAGE 28): ORGAN WEIGHT, RATIO OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT AND RATIO OF ORGAN WEIGHT TO BRAIN WEIGHT
INDIVIDUAL AND SUMMARY DATA - FEMALE RATS

INDIVIDUAL ORGAN WEIGHTS AND RATIOS (%) OF ORGAN WEIGHT TO BRAIN WEIGHT													
DOSAGE GROUP II 100 PPM													
RAT NUMBER	BRAIN WEIGHT	LIVER		KIDNEYS PAIRED		ADRENALS PAIRED		SPLEEN		LUNGS		THYMUS	
		ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW
3851	1.976	7.05	356.78	1.93	97.67	0.055	2.78	0.52	26.32	1.39	70.34	0.41	20.75
3852	2.064	7.58	367.25	2.06	99.81	0.071	3.44	0.54	26.16	1.50	72.67	0.27	13.08
3853	2.118	7.52	355.05	2.01	94.90	0.061	2.88	0.55	25.97	1.28	60.43	0.31	14.64
3854	2.005	7.59	378.55	1.97	98.25	0.076	3.79	0.68	33.92	1.42	70.82	0.31	15.46
3855	1.947	9.66	496.15	2.20	112.99	0.073	3.75	0.72	36.98	1.38	70.88	0.38	19.52
3856	2.154	7.56	350.97	2.28	105.85	0.052	2.41	0.82	38.07	1.31	60.82	0.28	13.00
3857	2.006	7.22	359.92	1.80	89.73	0.084	4.19	0.53	26.42	1.39	69.29	0.27	13.46
3858	1.975	7.35	372.15	2.12	107.34	0.059	2.99	0.75	37.97	1.19	60.25	0.24	12.15
3859	2.058	6.44	312.92	1.95	94.75	0.047	2.28	0.58	28.18	1.16	56.36	0.35	17.01
3860	1.984	8.54	430.44	1.99	100.30	0.067	3.38	0.74	37.30	1.50	75.60	0.53	26.71
RAT NUMBER	BRAIN WEIGHT	OVARIES PAIRED		UTERUS NON- GRAVID W/ CERVIX		HEART		FIXED THYROID/ PARATHYROID					
		ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW				
3851	1.976	0.092	4.66	0.48	24.29	1.07	54.15	0.04	2.02				
3852	2.064	0.127	6.15	0.65	31.49	1.08	52.32	0.02	0.97				
3853	2.118	0.107	5.05	0.60	28.33	1.42	67.04	0.06	2.83				
3854	2.005	0.116	5.78	0.47	23.44	1.06	52.87	0.04	2.00				
3855	1.947	0.104	5.34	0.51	26.19	1.36	69.85	0.04	2.05				
3856	2.154	0.070	3.25	1.05	48.75	1.08	50.14	0.03	1.39				
3857	2.006	0.082	4.09	0.79	39.38	0.99	49.35	0.04	1.99				
3858	1.975	0.097	4.91	0.89	45.06	1.22	61.77	0.03	1.52				
3859	2.058	0.086	4.18	0.57	27.70	0.99	48.10	0.03	1.46				
3860	1.984	0.126	6.35	0.70	35.28	1.12	56.45	0.03	1.51				

ALL WEIGHTS WERE RECORDED IN GRAMS (G). ABS. WT. = ORGAN WEIGHT. REL. % BRW = (ORGAN WEIGHT/BRAIN WEIGHT) X 100.

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PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 1 (PAGE 29): ORGAN WEIGHT, RATIO OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT AND RATIO OF ORGAN WEIGHT TO BRAIN WEIGHT
INDIVIDUAL AND SUMMARY DATA - FEMALE RATS

INDIVIDUAL ORGAN WEIGHTS AND RATIOS (%) OF ORGAN WEIGHT TO BRAIN WEIGHT													
DOSAGE GROUP III		500 PPM											
RAT NUMBER	BRAIN WEIGHT	LIVER		KIDNEYS PAIRED		ADRENALS PAIRED		SPLEEN		LUNGS		THYMUS	
		ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW
3926	1.984	6.72	338.71	1.94	97.78	0.057	2.87	0.54	27.22	1.17	58.97	0.32	16.13
3927	2.078	7.67	369.10	1.86	89.51	0.057	2.74	0.76	36.57	1.45	69.78	0.34	16.36
3928	2.010	7.37	366.67	1.90	94.53	0.064	3.18	0.63	31.34	1.38	68.66	0.27	13.43
3929	1.909	7.09	371.40	2.07	108.43	0.066	3.46	0.58	30.38	1.28	67.05	0.23	12.05
3930	2.226	7.63	342.77	2.19	98.38	0.069	3.10	0.60	26.95	1.34	60.20	0.37	16.62
3931	2.096	7.49	357.35	1.88	89.69	0.057	2.72	0.61	29.10	1.34	63.93	0.41	19.56
3932	1.978	8.30	419.62	1.75	88.47	0.095	4.80	0.69	34.88	1.39	70.27	0.43	21.74
3933	2.011	7.59	377.42	1.91	94.98	0.062	3.08	0.59	29.34	1.21	60.17	0.34	16.91
3934	1.935	7.89	407.75	2.24	115.76	0.066	3.41	0.66	34.11	1.37	70.80	0.24	12.40
3935	2.103	11.32	538.28	2.67	126.96	0.082	3.90	0.66	31.38	1.48	70.38	0.28	13.31
RAT NUMBER	BRAIN WEIGHT	OVARIES PAIRED		UTERUS NON- GRAVID W/ CERVIX		HEART		FIXED THYROID/ PARATHYROID					
		ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW				
3926	1.984	0.111	5.59	0.97	48.89	0.90	45.36	0.03	1.51				
3927	2.078	0.094	4.52	0.60	28.87	1.15	55.34	0.03	1.44				
3928	2.010	0.114	5.67	0.52	25.87	1.10	54.73	0.03	1.49				
3929	1.909	0.076	3.98	1.33	69.67	0.97	50.81	0.02	1.05				
3930	2.226	0.089	4.00	0.95	42.68	1.09	48.97	0.03	1.35				
3931	2.096	0.096	4.58	0.75	35.78	1.09	52.00	0.04	1.91				
3932	1.978	0.115	5.81	0.72	36.40	1.09	55.11	0.05	2.53				
3933	2.011	0.074	3.68	0.96	47.74	1.00	49.73	0.04	1.99				
3934	1.935	0.094	4.86	1.04	53.75	1.08	55.81	0.04	2.07				
3935	2.103	0.125	5.94	0.59	28.06	1.46	69.42	0.04	1.90				

ALL WEIGHTS WERE RECORDED IN GRAMS (G). ABS. WT. = ORGAN WEIGHT. REL. % BRW = (ORGAN WEIGHT/BRAIN WEIGHT) X 100.

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PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 1 (PAGE 30): ORGAN WEIGHT, RATIO OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT AND RATIO OF ORGAN WEIGHT TO BRAIN WEIGHT
INDIVIDUAL AND SUMMARY DATA - FEMALE RATS

INDIVIDUAL ORGAN WEIGHTS AND RATIOS (%) OF ORGAN WEIGHT TO BRAIN WEIGHT													
DOSAGE GROUP IV		5000 PPM											
RAT NUMBER	BRAIN WEIGHT	LIVER		KIDNEYS PAIRED		ADRENALS PAIRED		SPLEEN		LUNGS		THYMUS	
		ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW
3951	1.998	8.89	444.94	2.20	110.11	0.059	2.95	0.93	46.55	1.34	67.07	0.29	14.51
3952	2.101	8.28	394.10	2.14	101.86	0.057	2.71	0.69	32.84	1.40	66.63	0.42	19.99
3953	1.978	8.38	423.66	2.16	109.20	0.065	3.29	0.66	33.37	1.31	66.23	0.42	21.23
3954	1.973	12.21	618.85	2.76	139.89	0.065	3.29	0.69	34.97	1.35	68.42	0.49	24.84
3955	2.059	7.24	351.63	1.78	86.45	0.065	3.16	0.59	28.65	1.16	56.34	0.40	19.43
3956	1.940	9.51	490.21	2.48	127.84	0.054	2.78	0.56	28.86	1.32	68.04	0.29	14.95
3957	2.045	9.07	443.52	2.29	111.98	0.061	2.98	0.77	37.65	1.40	68.46	0.38	18.58
3958	2.026	7.39	364.76	2.04	100.69	0.063	3.11	0.46	22.70	1.28	63.18	0.22	10.86
3959	2.010	7.86	391.04	2.20	109.45	0.058	2.88	0.70	34.82	1.38	68.66	0.30	14.92
3960	2.063	8.38	406.20	2.27	110.03	0.059	2.86	0.48	23.27	1.32	63.98	0.34	16.48
RAT NUMBER	BRAIN WEIGHT	OVARIES PAIRED		UTERUS NON- GRAVID W/ CERVIX		HEART		FIXED THYROID/ PARATHYROID					
		ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW				
3951	1.998	0.125	6.26	1.60	80.08	1.11	55.56	0.04	2.00				
3952	2.101	0.106	5.04	0.77	36.65	0.99	47.12	0.06	2.86				
3953	1.978	0.091	4.60	0.74	37.41	1.02	51.57	0.03	1.52				
3954	1.973	0.092	4.66	0.66	33.45	1.25	63.36	0.04	2.03				
3955	2.059	0.106	5.15	0.72	34.97	0.96	46.62	0.02	0.97				
3956	1.940	0.094	4.84	1.01	52.06	1.28	65.98	0.02	1.03				
3957	2.045	0.102	4.99	0.54	26.40	1.06	51.83	0.02	0.98				
3958	2.026	0.104	5.13	0.62	30.60	0.99	48.86	0.02	0.99				
3959	2.010	0.091	4.53	0.71	35.32	1.14	56.72	0.02	1.00				
3960	2.063	0.099	4.80	0.64	31.02	1.19	57.68	0.02	0.97				

ALL WEIGHTS WERE RECORDED IN GRAMS (G). ABS. WT. = ORGAN WEIGHT. REL. % BRW = (ORGAN WEIGHT/BRAIN WEIGHT) X 100.

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PROTOCOL TQC00066: ORAL (DIET) REPEATED DOSE 90-DAY TOXICITY STUDY OF MALATHION TECHNICAL IN RATS

TABLE 1 (PAGE 31): ORGAN WEIGHT, RATIO OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT AND RATIO OF ORGAN WEIGHT TO BRAIN WEIGHT
INDIVIDUAL AND SUMMARY DATA - FEMALE RATS

INDIVIDUAL ORGAN WEIGHTS AND RATIOS (%) OF ORGAN WEIGHT TO BRAIN WEIGHT													
DOSAGE GROUP V 10000 PPM													
RAT NUMBER	BRAIN WEIGHT	LIVER		KIDNEYS PAIRED		ADRENALS PAIRED		SPLEEN		LUNGS		THYMUS	
		ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW
3876	2.010	7.78	387.06	1.96	97.51	0.046	2.29	0.48	23.88	1.18	58.71	0.26	12.94
3877	2.205	9.66	438.10	2.34	106.12	0.055	2.49	0.69	31.29	1.31	59.41	0.30	13.60
3878	2.169	7.76	357.77	1.78	82.06	0.073	3.36	0.50	23.05	1.16	53.48	0.24	11.06
3879	1.944	8.43	433.64	2.43	125.00	0.044	2.26	0.66	33.95	1.18	60.70	0.49	25.20
3880	1.971	10.66	540.84	2.50	126.84	0.135	6.85	0.63	31.96	1.18	59.87	0.39	19.79
3881	2.093	9.96	475.87	2.21	105.59	0.072	3.44	0.46	21.98	1.25	59.72	0.27	12.90
3882	2.067	6.49	313.98	1.82	88.05	0.055	2.66	0.52	25.16	1.16	56.12	0.33	15.96
3883	1.926	10.44	542.06	2.30	119.42	0.066	3.43	0.62	32.19	1.24	64.38	0.31	16.10
3884	2.074	8.52	410.80	2.04	98.36	0.064	3.08	0.55	26.52	1.29	62.20	0.35	16.88
3885	2.183	9.58	438.84	2.29	104.90	0.082	3.76	0.61	27.94	1.47	67.34	0.31	14.20
RAT NUMBER	BRAIN WEIGHT	OVARIES PAIRED		UTERUS NON- GRAVID W/ CERVIX		HEART		FIXED THYROID/ PARATHYROID					
		ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW	ABS. WT.	REL. % BRW				
3876	2.010	0.078	3.88	0.42	20.90	1.06	52.74	0.02	1.00				
3877	2.205	0.110	4.99	0.53	24.04	1.08	48.98	0.02	0.91				
3878	2.169	0.094	4.33	0.63	29.04	0.96	44.26	0.02	0.92				
3879	1.944	0.096	4.94	1.58	81.28	0.99	50.92	0.02	1.03				
3880	1.971	0.045	2.28	0.62	31.46	1.22	61.90	0.05	2.54				
3881	2.093	0.070	3.34	0.70	33.44	1.11	53.03	0.02	0.96				
3882	2.067	0.074	3.58	0.50	24.19	1.00	48.38	0.02	0.97				
3883	1.926	0.108	5.61	0.67	34.79	1.05	54.52	0.03	1.56				
3884	2.074	0.086	4.15	0.52	25.07	0.96	46.29	0.03	1.45				
3885	2.183	0.126	5.77	0.80	36.65	1.05	48.10	0.03	1.37				

ALL WEIGHTS WERE RECORDED IN GRAMS (G). ABS. WT. = ORGAN WEIGHT. REL. % BRW = (ORGAN WEIGHT/BRAIN WEIGHT) X 100.

Table 3
Pathology - Intergroup Comparison of Histopathology Observations (Day 91)

Table 3 includes histopathology observations from Groups 2, 3 and 4 gross lesions.

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Charles River Laboratories
Pathology - Intergroup Comparison of Histopathology Observations

Date: 29-Dec-2011 10:38

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Observations: Neo-Plastic and Non Neo-Plastic		----- MALES -----					----- FEMALES -----				
Removal Reason: SCHEDULE SACRIFICED		0	100	500	5000	10000	0	100	500	5000	10000
		ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Number of Animals on Study :		10	10	10	10	10	10	10	10	10	10
Number of Animals Completed:		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
ADRENAL GLAND;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		9	0	0	0	10	10	0	0	0	10
Congestion		(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
mild		1	0	0	0	0	0	0	0	0	0
AORTA;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		10	0	0	0	10	10	0	0	0	10
BONE MARROW, FEMUR;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		10	0	0	0	10	10	0	0	0	9
Hypocellularity		(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1)
minimal		0	0	0	0	0	0	0	0	0	1
BONE, FEMUR;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		10	0	0	0	10	10	0	0	0	10
BONE, STERNUM;											
Examined.....		(5)	(0)	(0)	(0)	(6)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		5	0	0	0	6	10	0	0	0	10
Not Examined: NOT COLLECTED AT NECROPSY		5	0	0	0	4	0	0	0	0	0
BRAIN;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		10	0	0	0	10	10	0	0	0	10
CERVIX;											
Examined.....		(-)	(-)	(-)	(-)	(-)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		-	-	-	-	-	9	0	0	0	10
Ectasia; vascular		(-)	(-)	(-)	(-)	(-)	(1)	(0)	(0)	(0)	(0)
minimal		-	-	-	-	-	1	0	0	0	0
COAGULATING GLAND;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(-)	(-)	(-)	(-)	(-)
Within Normal Limits.....		10	0	0	0	10	-	-	-	-	-

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Pathology - Intergroup Comparison of Histopathology Observations

Date: 29-Dec-2011 10:38

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Observations: Neo-Plastic and Non Neo-Plastic		----- MALES -----					----- FEMALES -----				
Removal Reason: SCHEDULE SACRIFICED		0	100	500	5000	10000	0	100	500	5000	10000
		ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Number of Animals on Study :		10	10	10	10	10	10	10	10	10	10
Number of Animals Completed:		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
EPIDIDYMIS;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(-)	(-)	(-)	(-)	(-)
Within Normal Limits.....		10	0	0	0	10	-	-	-	-	-
ESOPHAGUS;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		10	0	0	0	10	10	0	0	0	10
EYE;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		10	0	0	0	10	10	0	0	0	10
HARDERIAN GLAND;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		10	0	0	0	10	10	0	0	0	10
HEART;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		8	0	0	0	10	9	0	0	0	10
Cardiomyopathy		(2)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
minimal		2	0	0	0	0	0	0	0	0	0
Infiltration, Mixed Cell; Epicardium		(0)	(0)	(0)	(0)	(0)	(1)	(0)	(0)	(0)	(0)
minimal		0	0	0	0	0	1	0	0	0	0
INTESTINE, CECUM;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		10	0	0	0	8	10	0	0	0	10
Infiltration, Mononuclear Cell		(0)	(0)	(0)	(0)	(2)	(0)	(0)	(0)	(0)	(0)
minimal		0	0	0	0	1	0	0	0	0	0
mild		0	0	0	0	1	0	0	0	0	0
INTESTINE, COLON;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		10	0	0	0	10	10	0	0	0	10
INTESTINE, DUODENUM;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		10	0	0	0	10	10	0	0	0	10

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Pathology - Intergroup Comparison of Histopathology Observations

Date: 29-Dec-2011 10:38

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Observations: Neo-Plastic and Non Neo-Plastic		----- MALES -----					----- FEMALES -----				
Removal Reason: SCHEDULE SACRIFICED		0	100	500	5000	10000	0	100	500	5000	10000
		ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Number of Animals on Study :		10	10	10	10	10	10	10	10	10	10
Number of Animals Completed:		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
INTESTINE, ILEUM;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		10	0	0	0	10	10	0	0	0	10
INTESTINE, JEJUNUM;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		10	0	0	0	10	10	0	0	0	10
INTESTINE, RECTUM;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		10	0	0	0	8	10	0	0	0	10
Infiltration, Mononuclear Cell		(0)	(0)	(0)	(0)	(2)	(0)	(0)	(0)	(0)	(0)
minimal		0	0	0	0	1	0	0	0	0	0
mild		0	0	0	0	1	0	0	0	0	0
KIDNEY;											
Examined.....		(10)	(0)	(0)	(1)	(10)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		9	0	0	0	7	9	0	0	0	10
Hydronephrosis		(0)	(0)	(0)	(1)	(2)	(0)	(0)	(0)	(0)	(0)
minimal		0	0	0	0	1	0	0	0	0	0
mild		0	0	0	1	1	0	0	0	0	0
Nephropathy		(0)	(0)	(0)	(0)	(3)	(0)	(0)	(0)	(0)	(0)
minimal		0	0	0	0	3	0	0	0	0	0
Cyst		1	0	0	0	0	0	0	0	0	0
Infiltration, Mixed Cell		(0)	(0)	(0)	(0)	(0)	(1)	(0)	(0)	(0)	(0)
minimal		0	0	0	0	0	1	0	0	0	0
LARYNX;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		9	0	0	0	7	9	0	0	0	9
Infiltration, Mononuclear Cell		(1)	(0)	(0)	(0)	(2)	(0)	(0)	(0)	(0)	(0)
minimal		1	0	0	0	1	0	0	0	0	0
mild		0	0	0	0	1	0	0	0	0	0
Hyperplasia; epithelial		(0)	(0)	(0)	(0)	(1)	(0)	(0)	(0)	(0)	(0)
mild		0	0	0	0	1	0	0	0	0	0
Infiltration, Mixed Cell		(0)	(0)	(0)	(0)	(0)	(1)	(0)	(0)	(0)	(1)
mild		0	0	0	0	0	1	0	0	0	0
moderate		0	0	0	0	0	0	0	0	0	1

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Observations: Neo-Plastic and Non Neo-Plastic		----- MALES -----					----- FEMALES -----				
Removal Reason: SCHEDULE SACRIFICED		0	100	500	5000	10000	0	100	500	5000	10000
		ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Number of Animals on Study :		10	10	10	10	10	10	10	10	10	10
Number of Animals Completed:		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
LIVER;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		4	0	0	0	6	4	0	0	0	4
Necrosis; focal		(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
minimal		1	0	0	0	0	0	0	0	0	0
Vacuolation; hepatocellular; Periportal		(5)	(0)	(0)	(0)	(1)	(4)	(0)	(0)	(0)	(6)
minimal		3	0	0	0	1	4	0	0	0	4
mild		2	0	0	0	0	0	0	0	0	2
Infiltration, Mononuclear Cell		(0)	(0)	(0)	(0)	(3)	(1)	(0)	(0)	(0)	(1)
minimal		0	0	0	0	3	0	0	0	0	1
mild		0	0	0	0	0	1	0	0	0	0
Tension Lipidosis		(0)	(0)	(0)	(0)	(1)	(2)	(0)	(0)	(0)	(0)
minimal		0	0	0	0	1	2	0	0	0	0
LUNG;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		10	0	0	0	10	10	0	0	0	10
LYMPH NODE, MANDIBULAR;											
Examined.....		(10)	(1)	(0)	(1)	(10)	(10)	(1)	(0)	(0)	(10)
Within Normal Limits.....		9	0	0	0	9	10	0	0	0	10
Erythrophagocytosis		(1)	(1)	(0)	(1)	(0)	(0)	(1)	(0)	(0)	(0)
mild		1	1	0	1	0	0	1	0	0	0
Hyperplasia		(0)	(0)	(0)	(0)	(1)	(0)	(0)	(0)	(0)	(0)
minimal		0	0	0	0	1	0	0	0	0	0
LYMPH NODE, MESENTERIC;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		10	0	0	0	10	10	0	0	0	10
MAMMARY GLAND;											
Examined.....		(-)	(-)	(-)	(-)	(-)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		-	-	-	-	-	10	0	0	0	10
NOSE, LEVEL 1;											
Examined.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
Within Normal Limits.....		9	8	10	10	10	10	10	10	10	10
Infiltration, Mixed Cell		(1)	(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)

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Pathology - Intergroup Comparison of Histopathology Observations

Date: 29-Dec-2011 10:38

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Observations: Neo-Plastic and Non Neo-Plastic		----- MALES -----					----- FEMALES -----				
Removal Reason: SCHEDULE SACRIFICED		0	100	500	5000	10000	0	100	500	5000	10000
		ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Number of Animals on Study :		10	10	10	10	10	10	10	10	10	10
Number of Animals Completed:		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
NOSE, LEVEL 1; (continued)											
minimal		1	1	0	0	0	0	0	0	0	0
Hyperkeratosis		(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
minimal		1	0	0	0	0	0	0	0	0	0
Hyperplasia; epithelial		(0)	(2)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
minimal		0	2	0	0	0	0	0	0	0	0
NOSE, LEVEL 2;											
Examined.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
Within Normal Limits.....		10	10	5	0	1	10	10	5	2	0
Depletion; Goblet Cell		(0)	(0)	(5)	(10)	(9)	(0)	(0)	(5)	(8)	(10)
minimal		0	0	5	1	3	0	0	3	4	1
mild		0	0	0	7	2	0	0	2	3	2
moderate		0	0	0	2	4	0	0	0	1	6
marked		0	0	0	0	0	0	0	0	0	1
Vacuolation; Respiratory Epithelium		(0)	(0)	(0)	(1)	(0)	(0)	(0)	(0)	(0)	(0)
minimal		0	0	0	1	0	0	0	0	0	0
Infiltration, Mixed Cell		(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1)
mild		0	0	0	0	0	0	0	0	0	1
NOSE, LEVEL 3;											
Examined.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
Within Normal Limits.....		10	9	10	1	0	10	10	10	1	0
Hyperplasia; Olfactory Epithelium		(0)	(0)	(0)	(9)	(10)	(0)	(0)	(0)	(9)	(10)
minimal		0	0	0	6	7	0	0	0	5	3
mild		0	0	0	3	3	0	0	0	4	6
moderate		0	0	0	0	0	0	0	0	0	1
Hemorrhage; peracute		(0)	(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
minimal		0	1	0	0	0	0	0	0	0	0
Infiltration, Mixed Cell		(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1)
minimal		0	0	0	0	0	0	0	0	0	1
Hyperostosis; unilateral		(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1)	(0)
mild		0	0	0	0	0	0	0	0	1	0
NOSE, LEVEL 4;											
Examined.....		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
Within Normal Limits.....		9	10	10	0	0	10	10	10	0	0
Necrosis; lymphoid		(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)

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Testing Facility Study No. TQC00066

PTA005-01/04

Charles River Laboratories
Pathology - Intergroup Comparison of Histopathology Observations

Date: 29-Dec-2011 10:38

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Observations: Neo-Plastic and Non Neo-Plastic		----- MALES -----					----- FEMALES -----				
Removal Reason: SCHEDULE SACRIFICED		0	100	500	5000	10000	0	100	500	5000	10000
		ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Number of Animals on Study :		10	10	10	10	10	10	10	10	10	10
Number of Animals Completed:		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
NOSE, LEVEL 4; (continued)											
minimal		1	0	0	0	0	0	0	0	0	0
Hemorrhage; peracute		(1)	(0)	(0)	(1)	(0)	(0)	(0)	(0)	(0)	(0)
mild		1	0	0	0	0	0	0	0	0	0
moderate		0	0	0	1	0	0	0	0	0	0
Hyperplasia; Olfactory Epithelium		(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(10)	(10)
minimal		0	0	0	0	0	0	0	0	1	0
mild		0	0	0	7	7	0	0	0	4	5
moderate		0	0	0	3	3	0	0	0	5	5
Vacuolation; Respiratory Epithelium		(0)	(0)	(0)	(1)	(1)	(0)	(0)	(0)	(0)	(0)
minimal		0	0	0	1	0	0	0	0	0	0
mild		0	0	0	0	1	0	0	0	0	0
NOSE, LEVEL 5;											
Examined.....		(10)	(8)	(10)	(10)	(10)	(10)	(10)	(10)	(9)	(10)
Within Normal Limits.....		9	7	10	0	0	10	10	10	0	0
Not Examined: NOT FOUND AT TRIMMING		0	2	0	0	0	0	0	0	1	0
Hemorrhage; peracute		(1)	(1)	(0)	(1)	(0)	(0)	(0)	(0)	(0)	(0)
minimal		0	1	0	0	0	0	0	0	0	0
mild		1	0	0	1	0	0	0	0	0	0
Hyperplasia; Olfactory Epithelium		(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(9)	(10)
minimal		0	0	0	0	1	0	0	0	0	0
mild		0	0	0	4	2	0	0	0	4	3
moderate		0	0	0	6	7	0	0	0	5	7
NERVE, OPTIC;											
Examined.....		(10)	(0)	(0)	(0)	(8)	(9)	(0)	(0)	(0)	(9)
Within Normal Limits.....		10	0	0	0	8	9	0	0	0	9
Not Examined: NOT PRESENT ON SLIDE		0	0	0	0	2	1	0	0	0	1
NERVE, SCIATIC;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		10	0	0	0	10	10	0	0	0	10
OVARY;											
Examined.....		(-)	(-)	(-)	(-)	(-)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		-	-	-	-	-	10	0	0	0	8
Cyst; Follicle		(-)	(-)	(-)	(-)	(-)	(0)	(0)	(0)	(0)	(2)

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Observations: Neo-Plastic and Non Neo-Plastic		----- MALES -----					----- FEMALES -----				
Removal Reason: SCHEDULE SACRIFICED		0	100	500	5000	10000	0	100	500	5000	10000
Number of Animals on Study :		ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Number of Animals Completed:		10	10	10	10	10	10	10	10	10	10
		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
OVARY; (continued)											
mild		-	-	-	-	-	0	0	0	0	1
moderate		-	-	-	-	-	0	0	0	0	1
OVIDUCT;											
Examined.....		(-)	(-)	(-)	(-)	(-)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		-	-	-	-	-	10	0	0	0	10
PANCREAS;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		9	0	0	0	7	10	0	0	0	9
Hyperplasia; Islet Cell		(1)	(0)	(0)	(0)	(1)	(0)	(0)	(0)	(0)	(0)
minimal		1	0	0	0	1	0	0	0	0	0
Apoptosis		(0)	(0)	(0)	(0)	(2)	(0)	(0)	(0)	(0)	(0)
minimal		0	0	0	0	1	0	0	0	0	0
mild		0	0	0	0	1	0	0	0	0	0
Infiltration, Mononuclear Cell		(0)	(0)	(0)	(0)	(2)	(0)	(0)	(0)	(0)	(1)
minimal		0	0	0	0	1	0	0	0	0	1
mild		0	0	0	0	1	0	0	0	0	0
PARATHYROID GLAND;											
Examined.....		(6)	(0)	(0)	(0)	(5)	(3)	(0)	(0)	(0)	(7)
Within Normal Limits.....		6	0	0	0	5	3	0	0	0	7
Not Examined: NOT FOUND AT TRIMMING		0	0	0	0	0	0	0	0	0	1
Not Examined: NOT PRESENT ON SLIDE		4	0	0	0	5	7	0	0	0	2
PEYERS PATCH;											
Examined.....		(8)	(0)	(0)	(0)	(8)	(10)	(0)	(0)	(0)	(9)
Within Normal Limits.....		8	0	0	0	7	10	0	0	0	8
Not Examined: NOT PRESENT ON SLIDE		2	0	0	0	2	0	0	0	0	1
Hyperplasia		(0)	(0)	(0)	(0)	(1)	(0)	(0)	(0)	(0)	(1)
mild		0	0	0	0	1	0	0	0	0	1
PHARYNX;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		10	0	0	0	10	10	0	0	0	10

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Date: 29-Dec-2011 10:38

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Observations: Neo-Plastic and Non Neo-Plastic		----- MALES -----					----- FEMALES -----				
Removal Reason: SCHEDULE SACRIFICED		0	100	500	5000	10000	0	100	500	5000	10000
Number of Animals on Study :		ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Number of Animals Completed:		10	10	10	10	10	10	10	10	10	10
		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
PITUITARY GLAND;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		10	0	0	0	10	10	0	0	0	10
PROSTATE GLAND;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(-)	(-)	(-)	(-)	(-)
Within Normal Limits.....		7	0	0	0	5	-	-	-	-	-
Infiltration, Mononuclear Cell		(3)	(0)	(0)	(0)	(5)	(-)	(-)	(-)	(-)	(-)
minimal		3	0	0	0	5	-	-	-	-	-
SALIVARY GLAND;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		10	0	0	0	10	10	0	0	0	10
SEMINAL VESICLE;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(-)	(-)	(-)	(-)	(-)
Within Normal Limits.....		10	0	0	0	10	-	-	-	-	-
SKELETAL MUSCLE;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(9)
Within Normal Limits.....		10	0	0	0	10	10	0	0	0	9
Not Examined: NOT FOUND AT TRIMMING		0	0	0	0	0	0	0	0	0	1
SKIN, MAMMARY;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		10	0	0	0	10	10	0	0	0	10
SPINAL CORD;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		10	0	0	0	10	10	0	0	0	10
SPLEEN;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		8	0	0	0	10	10	0	0	0	10
Depletion; White Pulp		(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
mild		1	0	0	0	0	0	0	0	0	0
Constriction		1	0	0	0	0	0	0	0	0	0

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Date: 29-Dec-2011 10:38

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Observations: Neo-Plastic and Non Neo-Plastic		----- MALES -----					----- FEMALES -----				
Removal Reason: SCHEDULE SACRIFICED		0	100	500	5000	10000	0	100	500	5000	10000
		ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Number of Animals on Study :		10	10	10	10	10	10	10	10	10	10
Number of Animals Completed:		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
STOMACH;											
Examined.....		(10)	(0)	(0)	(0)	(9)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		10	0	0	0	9	9	0	0	0	10
Not Examined: NOT FOUND AT TRIMMING		0	0	0	0	1	0	0	0	0	0
Vacuolation; Non-Glandular		(0)	(0)	(0)	(0)	(0)	(1)	(0)	(0)	(0)	(0)
minimal		0	0	0	0	0	1	0	0	0	0
Infiltration, Mixed Cell		(0)	(0)	(0)	(0)	(0)	(1)	(0)	(0)	(0)	(0)
minimal		0	0	0	0	0	1	0	0	0	0
TESTIS;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(-)	(-)	(-)	(-)	(-)
Within Normal Limits.....		10	0	0	0	10	-	-	-	-	-
THYMUS;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		7	0	0	0	10	10	0	0	0	10
Depletion; cortical		(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
mild		1	0	0	0	0	0	0	0	0	0
Hemorrhage; peracute		(2)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
minimal		2	0	0	0	0	0	0	0	0	0
THYROID GLAND;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(8)
Within Normal Limits.....		10	0	0	0	10	10	0	0	0	8
Not Examined: INSUFFICIENT TISSUE FOR EVALUATION		0	0	0	0	0	0	0	0	0	1
Not Examined: NOT FOUND AT TRIMMING		0	0	0	0	0	0	0	0	0	1
TONGUE;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		10	0	0	0	10	10	0	0	0	10
TRACHEA;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		10	0	0	0	10	10	0	0	0	10
URETER;											
Examined.....		(10)	(0)	(0)	(0)	(9)	(9)	(0)	(0)	(0)	(10)
Within Normal Limits.....		10	0	0	0	9	9	0	0	0	10

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Charles River Laboratories
Pathology - Intergroup Comparison of Histopathology Observations

Date: 29-Dec-2011 10:38

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Observations: Neo-Plastic and Non Neo-Plastic		----- MALES -----					----- FEMALES -----				
Removal Reason: SCHEDULE SACRIFICED		0	100	500	5000	10000	0	100	500	5000	10000
Number of Animals on Study :		ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Number of Animals Completed:		10	10	10	10	10	10	10	10	10	10
		(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
URETER; (continued)											
Not Examined: NOT PRESENT ON SLIDE		0	0	0	0	1	1	0	0	0	0
URINARY BLADDER;											
Examined.....		(10)	(0)	(0)	(0)	(10)	(8)	(0)	(0)	(0)	(10)
Within Normal Limits.....		10	0	0	0	10	8	0	0	0	10
Not Examined: NOT PRESENT ON SLIDE		0	0	0	0	0	2	0	0	0	0
UTERUS;											
Examined.....		(-)	(-)	(-)	(-)	(-)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		-	-	-	-	-	10	0	0	0	9
Dilation		(-)	(-)	(-)	(-)	(-)	(0)	(0)	(0)	(0)	(1)
minimal		-	-	-	-	-	0	0	0	0	1
VAGINA;											
Examined.....		(-)	(-)	(-)	(-)	(-)	(10)	(0)	(0)	(0)	(10)
Within Normal Limits.....		-	-	-	-	-	10	0	0	0	10
SKIN;											
Examined.....		(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Within Normal Limits.....		0	0	0	0	0	0	0	0	0	0
Not Examined: NOT FOUND AT TRIMMING		0	0	0	0	1	0	0	0	1	0
ADIPOSE;											
Examined.....		(0)	(0)	(0)	(0)	(0)	(1)	(0)	(0)	(0)	(0)
Within Normal Limits.....		0	0	0	0	0	0	0	0	0	0
Necrosis		(0)	(0)	(0)	(0)	(0)	(1)	(0)	(0)	(0)	(0)
mild		0	0	0	0	0	1	0	0	0	0

Appendix 1 Deviations

DEVIATIONS

All deviations that occurred during the portion of the study performed by Charles River Laboratories, Pathology Associates have been authorized/acknowledged by the Study Director, assessed for impact, and documented in the study records. All protocol deviations are listed below.

None of the deviations were considered to have impacted the overall integrity of the study or the interpretation of the study results and conclusions.

Histopathology

- Some of the tissues listed in the protocol and subsequent amendments for histopathologic evaluation were not recovered on the slide for microscopic evaluation. This had no impact on the study.

Appendix 2
Pathology - Individual Animal Data (Concise Edition)

The term “None” in the Individual Animal Data (Concise Edition) as it applies to terminal body weight indicates that no data was entered.

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Testing Facility Study No. TQC00066

PTA019-01/00

Charles River Laboratories
Pathology - Individual Animal Data (Concise Edition)

Date: 29-Dec-2011 10:39

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3776	Group: 1	Sex: Male	Species: Rat	Strain: Sprague Dawley
Test Material: Certified Rodent Diet 5002		Dose: 0 ppm	Route: Oral Diet	Study Type: Toxicity
Date of Death : 18APR2011	Study Day No. (Week): 91 (13)	Mode of Death: SCHEDULE SACRIFICED		
Date of Necropsy: 18APR2011	** NECROPSY COMPLETE **			
Pathologist: Carol J. Detrisac	** EXAMINATION COMPLETE **			

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

LIVER;

Vacuolation; Periportal; hepatocellular; minimal

URETER;

One of pair was available for evaluation

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BRAIN	COAGULATING GLAND	EPIDIDYMIS
ESOPHAGUS	EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON	INTESTINE, DUODENUM
INTESTINE, ILEUM	INTESTINE, JEJUNUM	INTESTINE, RECTUM	KIDNEY	LARYNX	LUNG	LYMPH NODE, MANDIBULAR
LYMPH NODE, MESENTERIC		NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
NERVE, OPTIC	NERVE, SCIATIC	PANCREAS	PEYERS PATCH	PHARYNX	PITUITARY GLAND	PROSTATE GLAND
SALIVARY GLAND	SEMINAL VESICLE	SKELETAL MUSCLE	SKIN, MAMMARY	SPINAL CORD	SPLEEN	STOMACH
TESTIS	THYMUS	THYROID GLAND	TONGUE	TRACHEA	URETER	URINARY BLADDER

The following tissues have not been examined:

BONE, STERNUM; NOT COLLECTED AT NECROPSY
PARATHYROID GLAND; NOT PRESENT ON SLIDE

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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Testing Facility Study No. TQC00066

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Charles River Laboratories
Pathology - Individual Animal Data (Concise Edition)

Date: 29-Dec-2011 10:39

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3777	Group: 1	Sex: Male	Species: Rat	Strain: Sprague Dawley
------------------	----------	-----------	--------------	------------------------

Test Material: Certified Rodent Diet 5002 Dose: 0 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 18APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 18APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:ADRENAL GLAND;
Congestion; mildLIVER;
Vacuolation; Periportal; hepatocellular; mildPANCREAS;
Hyperplasia; Islet Cell; minimalURETER;
One of pair was available for evaluation

The following tissues were within normal limits:

AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BRAIN	COAGULATING GLAND	EPIDIDYMIS	ESOPHAGUS
EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON	INTESTINE, DUODENUM	INTESTINE, ILEUM
INTESTINE, JEJUNUM	INTESTINE, RECTUM	KIDNEY	LARYNX	LUNG	LYMPH NODE, MANDIBULAR	
LYMPH NODE, MESENTERIC		NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
NERVE, OPTIC	NERVE, SCIATIC	PARATHYROID GLAND	PEYERS PATCH	PHARYNX	PITUITARY GLAND	PROSTATE GLAND
SALIVARY GLAND	SEMINAL VESICLE	SKELETAL MUSCLE	SKIN, MAMMARY	SPINAL CORD	SPLEEN	STOMACH
TESTIS	THYMUS	THYROID GLAND	TONGUE	TRACHEA	URETER	URINARY BLADDER

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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Charles River Laboratories
Pathology - Individual Animal Data (Concise Edition)

Date: 29-Dec-2011 10:39

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3777 Group: 1 Sex: Male (continued)

The following tissues have not been examined:

BONE, STERNUM; NOT COLLECTED AT NECROPSY

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3778	Group: 1	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Certified Rodent Diet 5002 Dose: 0 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 18APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 18APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations:Correlated with:

LIVER;

Misshapen (TGL): right lateral lobe NO CORRELATION; No Correlating Lesion (H)

LYMPH NODE, MANDIBULAR;

Dark Red (TGL) LYMPH NODE, MANDIBULAR; Erythrophagocytosis; mild (H)

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

LIVER;

Vacuolation; Periportal; hepatocellular; minimal

LYMPH NODE, MANDIBULAR;

Erythrophagocytosis; mild LYMPH NODE, MANDIBULAR; Dark Red (G)

NOSE, LEVEL 4;

Necrosis; lymphoid; minimal
Hemorrhage; peracute; mild

NOSE, LEVEL 5;

Hemorrhage; peracute; mild

NERVE, OPTIC;

One of pair was available for evaluation

PARATHYROID GLAND;

One of pair was available for evaluation

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3778 Group: 1 Sex: Male (continued)

Histo Pathology Observations: (continued)

THYMUS;

Depletion; cortical; mild

URETER;

One of pair was available for evaluation

NO CORRELATION;

No Correlating Lesion LIVER; Misshapen (G)

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BRAIN	COAGULATING GLAND	EPIDIDYMIS
ESOPHAGUS	EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON	INTESTINE, DUODENUM
INTESTINE, ILEUM	INTESTINE, JEJUNUM	INTESTINE, RECTUM	KIDNEY	LARYNX	LUNG	LYMPH NODE, MESENTERIC
NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NERVE, OPTIC	NERVE, SCIATIC	PANCREAS	PARATHYROID GLAND
PEYERS PATCH	PHARYNX	PITUITARY GLAND	PROSTATE GLAND	SALIVARY GLAND	SEMINAL VESICLE	SKELETAL MUSCLE
SKIN, MAMMARY	SPINAL CORD	SPLEEN	STOMACH	TESTIS	THYROID GLAND	TONGUE
TRACHEA	URETER	URINARY BLADDER				

The following tissues have not been examined:

BONE, STERNUM; NOT COLLECTED AT NECROPSY

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3779 Group: 1 Sex: Male Species: Rat Strain: Sprague Dawley

Test Material: Certified Rodent Diet 5002 Dose: 0 ppm Route: Oral Diet Study Type: Toxicity

Date of Death : 18APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED

Date of Necropsy: 18APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations:Correlated with:THYMUS;

Red Areas (TGL): too numerous to count, measuring pinpoint to 0.1 cm in diameter THYMUS; Hemorrhage; peracute; minimal (H)

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:LARYNX;

Infiltration, Mononuclear Cell; minimal

LIVER;

Necrosis; focal; minimal

PARATHYROID GLAND;

One of pair was available for evaluation

THYMUS;

Hemorrhage; peracute; minimal THYMUS; Red Areas (G)

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BRAIN	COAGULATING GLAND	EPIDIDYMIS
ESOPHAGUS	EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON	INTESTINE, DUODENUM
INTESTINE, ILEUM	INTESTINE, JEJUNUM	INTESTINE, RECTUM	KIDNEY	LUNG	LYMPH NODE, MANDIBULAR	
LYMPH NODE, MESENTERIC		NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
NERVE, OPTIC	NERVE, SCIATIC	PANCREAS	PARATHYROID GLAND	PEYERS PATCH	PHARYNX	PITUITARY GLAND
PROSTATE GLAND	SALIVARY GLAND	SEMINAL VESICLE	SKELETAL MUSCLE	SKIN, MAMMARY	SPINAL CORD	SPLEEN
STOMACH	TESTIS	THYROID GLAND	TONGUE	TRACHEA	URETER	URINARY BLADDER

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3779 Group: 1 Sex: Male (continued)

The following tissues have not been examined:

BONE, STERNUM; NOT COLLECTED AT NECROPSY

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3780	Group: 1	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Certified Rodent Diet 5002 Dose: 0 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 18APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 18APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

HEART;
Cardiomyopathy; minimalPROSTATE GLAND;
Infiltration, Mononuclear Cell; minimal

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BRAIN	COAGULATING GLAND	EPIDIDYMIS
ESOPHAGUS	EYE	HARDERIAN GLAND	INTESTINE, CECUM	INTESTINE, COLON	INTESTINE, DUODENUM	INTESTINE, ILEUM
INTESTINE, JEJUNUM	INTESTINE, RECTUM	KIDNEY	LARYNX	LIVER	LUNG	LYMPH NODE, MANDIBULAR
LYMPH NODE, MESENTERIC		NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
NERVE, OPTIC	NERVE, SCIATIC	PANCREAS	PEYERS PATCH	PHARYNX	PITUITARY GLAND	SALIVARY GLAND
SEMINAL VESICLE	SKELETAL MUSCLE	SKIN, MAMMARY	SPINAL CORD	SPLEEN	STOMACH	TESTIS
THYMUS	THYROID GLAND	TONGUE	TRACHEA	URETER	URINARY BLADDER	

The following tissues have not been examined:

BONE, STERNUM; NOT COLLECTED AT NECROPSY
PARATHYROID GLAND; NOT PRESENT ON SLIDE

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3781	Group: 1	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Certified Rodent Diet 5002 Dose: 0 ppm Route: Oral Diet Study Type: Toxicity
 Date of Death : 19APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
 Date of Necropsy: 19APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

LIVER;

Vacuolation; Periportal; hepatocellular; mild

NOSE, LEVEL 1;

Infiltration, Mixed Cell; minimal
Hyperkeratosis; minimal

PROSTATE GLAND;

Infiltration, Mononuclear Cell; minimal

SPLEEN;

Depletion; White Pulp; mild

URETER;

One of pair was available for evaluation

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BONE, STERNUM	BRAIN	COAGULATING GLAND
EPIDIDYMIS	ESOPHAGUS	EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON
INTESTINE, DUODENUM	INTESTINE, ILEUM	INTESTINE, JEJUNUM	INTESTINE, RECTUM	KIDNEY	LARYNX	LUNG
LYMPH NODE, MANDIBULAR		LYMPH NODE, MESENTERIC		NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4
NOSE, LEVEL 5	NERVE, OPTIC	NERVE, SCIATIC	PANCREAS	PARATHYROID GLAND	PHARYNX	PITUITARY GLAND
SALIVARY GLAND	SEMINAL VESICLE	SKELETAL MUSCLE	SKIN, MAMMARY	SPINAL CORD	STOMACH	TESTIS
THYMUS	THYROID GLAND	TONGUE	TRACHEA	URETER	URINARY BLADDER	

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3781 Group: 1 Sex: Male (continued)

The following tissues have not been examined:

PEYERS PATCH; NOT PRESENT ON SLIDE

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3782	Group: 1	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Certified Rodent Diet 5002 Dose: 0 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 19APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 19APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

KIDNEY;
CystNERVE, OPTIC;
One of pair was available for evaluationURETER;
One of pair was available for evaluation

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BONE, STERNUM	BRAIN	COAGULATING GLAND
EPIDIDYMIS	ESOPHAGUS	EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON
INTESTINE, DUODENUM	INTESTINE, ILEUM	INTESTINE, JEJUNUM	INTESTINE, RECTUM	LARYNX	LIVER	LUNG
LYMPH NODE, MANDIBULAR		LYMPH NODE, MESENTERIC		NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3
NOSE, LEVEL 4	NOSE, LEVEL 5	NERVE, OPTIC	NERVE, SCIATIC	PANCREAS	PHARYNX	PITUITARY GLAND
PROSTATE GLAND	SALIVARY GLAND	SEMINAL VESICLE	SKELETAL MUSCLE	SKIN, MAMMARY	SPINAL CORD	SPLEEN
STOMACH	TESTIS	THYMUS	THYROID GLAND	TONGUE	TRACHEA	URETER
URINARY BLADDER						

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3782 Group: 1 Sex: Male (continued)

The following tissues have not been examined:

PARATHYROID GLAND; NOT PRESENT ON SLIDE
PEYERS PATCH; NOT PRESENT ON SLIDE

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3783	Group: 1	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Certified Rodent Diet 5002 Dose: 0 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 19APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 19APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

PARATHYROID GLAND;

One of pair was available for evaluation

PROSTATE GLAND;

Infiltration, Mononuclear Cell; minimal

URETER;

One of pair was available for evaluation

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BONE, STERNUM	BRAIN	COAGULATING GLAND
EPIDIDYMIS	ESOPHAGUS	EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON
INTESTINE, DUODENUM	INTESTINE, ILEUM	INTESTINE, JEJUNUM	INTESTINE, RECTUM	KIDNEY	LARYNX	LIVER
LUNG	LYMPH NODE, MANDIBULAR		LYMPH NODE, MESENTERIC		NOSE, LEVEL 1	NOSE, LEVEL 2
NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5	NERVE, OPTIC	NERVE, SCIATIC	PANCREAS	PARATHYROID GLAND
PEYERS PATCH	PHARYNX	PITUITARY GLAND	SALIVARY GLAND	SEMINAL VESICLE	SKELETAL MUSCLE	SKIN, MAMMARY
SPINAL CORD	SPLEEN	STOMACH	TESTIS	THYMUS	THYROID GLAND	TONGUE
TRACHEA	URETER	URINARY BLADDER				

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3784	Group: 1	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Certified Rodent Diet 5002 Dose: 0 ppm Route: Oral Diet Study Type: Toxicity
 Date of Death : 19APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
 Date of Necropsy: 19APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations:Correlated with:

SPLEEN;

Constricted Area (TGL): measuring 1.6 cm x 0.5 cm SPLEEN; Constriction (H)

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

NERVE, OPTIC;

One of pair was available for evaluation

SPLEEN;

Constriction SPLEEN; Constricted Area (G)

URETER;

One of pair was available for evaluation

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BONE, STERNUM	BRAIN	COAGULATING GLAND
EPIDIDYMIS	ESOPHAGUS	EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON
INTESTINE, DUODENUM	INTESTINE, ILEUM	INTESTINE, JEJUNUM	INTESTINE, RECTUM	KIDNEY	LARYNX	LIVER
LUNG	LYMPH NODE, MANDIBULAR		LYMPH NODE, MESENTERIC		NOSE, LEVEL 1	NOSE, LEVEL 2
NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5	NERVE, OPTIC	NERVE, SCIATIC	PANCREAS	PEYERS PATCH
PHARYNX	PITUITARY GLAND	PROSTATE GLAND	SALIVARY GLAND	SEMINAL VESICLE	SKELETAL MUSCLE	SKIN, MAMMARY
SPINAL CORD	STOMACH	TESTIS	THYMUS	THYROID GLAND	TONGUE	TRACHEA
URETER	URINARY BLADDER					

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3784 Group: 1 Sex: Male (continued)

The following tissues have not been examined:

PARATHYROID GLAND; NOT PRESENT ON SLIDE

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3785	Group: 1	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Certified Rodent Diet 5002 Dose: 0 ppm Route: Oral Diet Study Type: Toxicity
 Date of Death : 19APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
 Date of Necropsy: 19APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:HEART;
Cardiomyopathy; minimalLIVER;
Vacuolation; Periportal; hepatocellular; minimalPARATHYROID GLAND;
One of pair was available for evaluationTHYMUS;
Hemorrhage; peracute; minimalURETER;
One of pair was available for evaluation

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BONE, STERNUM	BRAIN	COAGULATING GLAND
EPIDIDYMIS	ESOPHAGUS	EYE	HARDERIAN GLAND	INTESTINE, CECUM	INTESTINE, COLON	INTESTINE, DUODENUM
INTESTINE, ILEUM	INTESTINE, JEJUNUM	INTESTINE, RECTUM	KIDNEY	LARYNX	LUNG	LYMPH NODE, MANDIBULAR
LYMPH NODE, MESENTERIC		NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
NERVE, OPTIC	NERVE, SCIATIC	PANCREAS	PARATHYROID GLAND	PEYERS PATCH	PHARYNX	PITUITARY GLAND
PROSTATE GLAND	SALIVARY GLAND	SEMINAL VESICLE	SKELETAL MUSCLE	SKIN, MAMMARY	SPINAL CORD	SPLEEN
STOMACH	TESTIS	THYROID GLAND	TONGUE	TRACHEA	URETER	URINARY BLADDER

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3901	Group: 1	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Certified Rodent Diet 5002 Dose: 0 ppm Route: Oral Diet Study Type: Toxicity
 Date of Death : 20APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
 Date of Necropsy: 20APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

LIVER;

Infiltration, Mononuclear Cell; mild

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BONE, STERNUM	BRAIN	CERVIX
ESOPHAGUS	EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON	INTESTINE, DUODENUM
INTESTINE, ILEUM	INTESTINE, JEJUNUM	INTESTINE, RECTUM	KIDNEY	LARYNX	LUNG	LYMPH NODE, MANDIBULAR
LYMPH NODE, MESENTERIC		MAMMARY GLAND	NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4
NOSE, LEVEL 5	NERVE, OPTIC	NERVE, SCIATIC	OVARY	OVIDUCT	PANCREAS	PEYERS PATCH
PHARYNX	PITUITARY GLAND	SALIVARY GLAND	SKELETAL MUSCLE	SKIN, MAMMARY	SPINAL CORD	SPLEEN
STOMACH	THYMUS	THYROID GLAND	TONGUE	TRACHEA	URETER	URINARY BLADDER
UTERUS	VAGINA					

The following tissues have not been examined:

PARATHYROID GLAND; NOT PRESENT ON SLIDE

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3902	Group: 1	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Certified Rodent Diet 5002 Dose: 0 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 20APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 20APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

LIVER;

Vacuolation; Periportal; hepatocellular; minimal

NERVE, OPTIC;

One of pair was available for evaluation

STOMACH;

Vacuolation; Non-Glandular; minimal
Infiltration, Mixed Cell; minimal

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BONE, STERNUM	BRAIN	CERVIX
ESOPHAGUS	EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON	INTESTINE, DUODENUM
INTESTINE, ILEUM	INTESTINE, JEJUNUM	INTESTINE, RECTUM	KIDNEY	LARYNX	LUNG	LYMPH NODE, MANDIBULAR
LYMPH NODE, MESENTERIC		MAMMARY GLAND	NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4
NOSE, LEVEL 5	NERVE, OPTIC	NERVE, SCIATIC	OVARY	OVIDUCT	PANCREAS	PEYERS PATCH
PHARYNX	PITUITARY GLAND	SALIVARY GLAND	SKELETAL MUSCLE	SKIN, MAMMARY	SPINAL CORD	SPLEEN
THYMUS	THYROID GLAND	TONGUE	TRACHEA	URINARY BLADDER	UTERUS	VAGINA

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3902 Group: 1 Sex: Female (continued)

The following tissues have not been examined:

PARATHYROID GLAND; NOT PRESENT ON SLIDE
URETER; NOT PRESENT ON SLIDE

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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Testing Facility Study No. TQC00066

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3903	Group: 1	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Certified Rodent Diet 5002 Dose: 0 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 20APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 20APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations: None

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BONE, STERNUM	BRAIN	CERVIX
ESOPHAGUS	EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON	INTESTINE, DUODENUM
INTESTINE, ILEUM	INTESTINE, JEJUNUM	INTESTINE, RECTUM	KIDNEY	LARYNX	LIVER	LUNG
LYMPH NODE, MANDIBULAR		LYMPH NODE, MESENTERIC		MAMMARY GLAND	NOSE, LEVEL 1	NOSE, LEVEL 2
NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5	NERVE, OPTIC	NERVE, SCIATIC	OVARY	OVIDUCT
PANCREAS	PEYERS PATCH	PHARYNX	PITUITARY GLAND	SALIVARY GLAND	SKELETAL MUSCLE	SKIN, MAMMARY
SPINAL CORD	SPLEEN	STOMACH	THYMUS	THYROID GLAND	TONGUE	TRACHEA
URETER	URINARY BLADDER	UTERUS	VAGINA			

The following tissues have not been examined:

PARATHYROID GLAND; NOT PRESENT ON SLIDE

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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Date: 29-Dec-2011 10:39

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3904	Group: 1	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Certified Rodent Diet 5002 Dose: 0 ppm Route: Oral Diet Study Type: Toxicity
 Date of Death : 20APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
 Date of Necropsy: 20APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

NERVE, OPTIC;

One of pair was available for evaluation

URETER;

One of pair was available for evaluation

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BONE, STERNUM	BRAIN	CERVIX
ESOPHAGUS	EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON	INTESTINE, DUODENUM
INTESTINE, ILEUM	INTESTINE, JEJUNUM	INTESTINE, RECTUM	KIDNEY	LARYNX	LIVER	LUNG
LYMPH NODE, MANDIBULAR		LYMPH NODE, MESENTERIC		MAMMARY GLAND	NOSE, LEVEL 1	NOSE, LEVEL 2
NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5	NERVE, OPTIC	NERVE, SCIATIC	OVARY	OVIDUCT
PANCREAS	PEYERS PATCH	PHARYNX	PITUITARY GLAND	SALIVARY GLAND	SKELETAL MUSCLE	SKIN, MAMMARY
SPINAL CORD	SPLEEN	STOMACH	THYMUS	THYROID GLAND	TONGUE	TRACHEA
URETER	UTERUS					

The following tissues have not been examined:

PARATHYROID GLAND; NOT PRESENT ON SLIDE
 URINARY BLADDER; NOT PRESENT ON SLIDE

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3905	Group: 1	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Certified Rodent Diet 5002 Dose: 0 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 20APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 20APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

LIVER;

Vacuolation; Periportal; hepatocellular; minimal

PARATHYROID GLAND;

One of pair was available for evaluation

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BONE, STERNUM	BRAIN	CERVIX
ESOPHAGUS	EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON	INTESTINE, DUODENUM
INTESTINE, ILEUM	INTESTINE, JEJUNUM	INTESTINE, RECTUM	KIDNEY	LARYNX	LUNG	LYMPH NODE, MANDIBULAR
LYMPH NODE, MESENTERIC		MAMMARY GLAND	NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4
NOSE, LEVEL 5	NERVE, OPTIC	NERVE, SCIATIC	OVARY	OVIDUCT	PANCREAS	PARATHYROID GLAND
PEYERS PATCH	PHARYNX	PITUITARY GLAND	SALIVARY GLAND	SKELETAL MUSCLE	SKIN, MAMMARY	SPINAL CORD
SPLEEN	STOMACH	THYMUS	THYROID GLAND	TONGUE	TRACHEA	URETER
UTERUS	VAGINA					

The following tissues have not been examined:

URINARY BLADDER; NOT PRESENT ON SLIDE

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3906	Group: 1	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Certified Rodent Diet 5002 Dose: 0 ppm Route: Oral Diet Study Type: Toxicity
 Date of Death : 21APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
 Date of Necropsy: 21APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations:Correlated with:ADIPOSE;

Mass (TGL): Abdominal adipose, cut surface reveals tan firm material, meas- ADIPOSE; Necrosis; mild (H)
 res 0.5 cm x 0.5 cm x 0.1 cm

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:LIVER;

Vacuolation; Periportal; hepatocellular; minimal
 Tension Lipidosis; minimal

NERVE, OPTIC;

One of pair was available for evaluation

ADIPOSE;

Necrosis; mild ADIPOSE; Mass (G)

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BONE, STERNUM	BRAIN	CERVIX
ESOPHAGUS	EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON	INTESTINE, DUODENUM
INTESTINE, ILEUM	INTESTINE, JEJUNUM	INTESTINE, RECTUM	KIDNEY	LARYNX	LUNG	LYMPH NODE, MANDIBULAR
LYMPH NODE, MESENTERIC	NERVE, OPTIC	MAMMARY GLAND	NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4
NOSE, LEVEL 5	PITUITARY GLAND	NERVE, SCIATIC	OVARY	OVIDUCT	PANCREAS	PEYERS PATCH
PHARYNX	THYMUS	SALIVARY GLAND	SKELETAL MUSCLE	SKIN, MAMMARY	SPINAL CORD	SPLEEN
STOMACH	VAGINA	THYROID GLAND	TONGUE	TRACHEA	URETER	URINARY BLADDER

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3906 Group: 1 Sex: Female (continued)

The following tissues have not been examined:

PARATHYROID GLAND; NOT PRESENT ON SLIDE

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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Date: 29-Dec-2011 10:39

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3907	Group: 1	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Certified Rodent Diet 5002 Dose: 0 ppm Route: Oral Diet Study Type: Toxicity
 Date of Death : 21APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
 Date of Necropsy: 21APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

CERVIX;
Ectasia; vascular; minimal

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BONE, STERNUM	BRAIN	ESOPHAGUS
EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON	INTESTINE, DUODENUM	INTESTINE, ILEUM
INTESTINE, JEJUNUM	INTESTINE, RECTUM	KIDNEY	LARYNX	LIVER	LUNG	LYMPH NODE, MANDIBULAR
LYMPH NODE, MESENTERIC		MAMMARY GLAND	NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4
NOSE, LEVEL 5	NERVE, SCIATIC	OVARY	OVIDUCT	PANCREAS	PARATHYROID GLAND	PEYERS PATCH
PHARYNX	PITUITARY GLAND	SALIVARY GLAND	SKELETAL MUSCLE	SKIN, MAMMARY	SPINAL CORD	SPLEEN
STOMACH	THYMUS	THYROID GLAND	TONGUE	TRACHEA	URETER	URINARY BLADDER
UTERUS	VAGINA					

The following tissues have not been examined:

NERVE, OPTIC; NOT PRESENT ON SLIDE

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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Date: 29-Dec-2011 10:39

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3908	Group: 1	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Certified Rodent Diet 5002 Dose: 0 ppm Route: Oral Diet Study Type: Toxicity
 Date of Death : 21APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
 Date of Necropsy: 21APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

LARYNX;

Infiltration, Mixed Cell; mild

NERVE, OPTIC;

One of pair was available for evaluation

PARATHYROID GLAND;

One of pair was available for evaluation

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BONE, STERNUM	BRAIN	CERVIX
ESOPHAGUS	EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON	INTESTINE, DUODENUM
INTESTINE, ILEUM	INTESTINE, JEJUNUM	INTESTINE, RECTUM	KIDNEY	LIVER	LUNG	LYMPH NODE, MANDIBULAR
LYMPH NODE, MESENTERIC		MAMMARY GLAND	NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4
NOSE, LEVEL 5	NERVE, OPTIC	NERVE, SCIATIC	OVARY	OVIDUCT	PANCREAS	PARATHYROID GLAND
PEYERS PATCH	PHARYNX	PITUITARY GLAND	SALIVARY GLAND	SKELETAL MUSCLE	SKIN, MAMMARY	SPINAL CORD
SPLEEN	STOMACH	THYMUS	THYROID GLAND	TONGUE	TRACHEA	URETER
URINARY BLADDER	UTERUS	VAGINA				

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3909	Group: 1	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Certified Rodent Diet 5002 Dose: 0 ppm Route: Oral Diet Study Type: Toxicity
 Date of Death : 21APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
 Date of Necropsy: 21APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

ESOPHAGUS;
 Evaluated on slide 12.

HEART;
 Infiltration, Mixed Cell; Epicardium; minimal

LIVER;
 Vacuolation; Periportal; hepatocellular; minimal

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BONE, STERNUM	BRAIN	CERVIX
ESOPHAGUS	EYE	HARDERIAN GLAND	INTESTINE, CECUM	INTESTINE, COLON	INTESTINE, DUODENUM	INTESTINE, ILEUM
INTESTINE, JEJUNUM	INTESTINE, RECTUM	KIDNEY	LARYNX	LUNG	LYMPH NODE, MANDIBULAR	
LYMPH NODE, MESENTERIC		MAMMARY GLAND	NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4
NOSE, LEVEL 5	NERVE, OPTIC	NERVE, SCIATIC	OVARY	OVIDUCT	PANCREAS	PEYERS PATCH
PHARYNX	PITUITARY GLAND	SALIVARY GLAND	SKELETAL MUSCLE	SKIN, MAMMARY	SPINAL CORD	SPLEEN
STOMACH	THYMUS	THYROID GLAND	TONGUE	TRACHEA	URETER	URINARY BLADDER
UTERUS	VAGINA					

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3909 Group: 1 Sex: Female (continued)

The following tissues have not been examined:

PARATHYROID GLAND; NOT PRESENT ON SLIDE

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3910	Group: 1	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Certified Rodent Diet 5002 Dose: 0 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 21APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 21APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

EYE;

One of pair was available for evaluation

KIDNEY;

Infiltration, Mixed Cell; minimal

LIVER;

Tension Lipidosis; minimal

URETER;

One of pair was available for evaluation

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BONE, STERNUM	BRAIN	CERVIX
ESOPHAGUS	EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON	INTESTINE, DUODENUM
INTESTINE, ILEUM	INTESTINE, JEJUNUM	INTESTINE, RECTUM	LARYNX	LUNG	LYMPH NODE, MANDIBULAR	
LYMPH NODE, MESENTERIC		MAMMARY GLAND	NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4
NOSE, LEVEL 5	NERVE, OPTIC	NERVE, SCIATIC	OVARY	OVIDUCT	PANCREAS	PEYERS PATCH
PHARYNX	PITUITARY GLAND	SALIVARY GLAND	SKELETAL MUSCLE	SKIN, MAMMARY	SPINAL CORD	SPLEEN
STOMACH	THYMUS	THYROID GLAND	TONGUE	TRACHEA	URETER	URINARY BLADDER
UTERUS	VAGINA					

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3910 Group: 1 Sex: Female (continued)

The following tissues have not been examined:

PARATHYROID GLAND; NOT PRESENT ON SLIDE

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3726	Group: 2	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 100 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 18APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 18APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations: NoneThe following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
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Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3727	Group: 2	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 100 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 18APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 18APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations: NoneThe following tissues were within normal limits:

NOSE, LEVEL 1 NOSE, LEVEL 2 NOSE, LEVEL 3 NOSE, LEVEL 4

The following tissues have not been examined:

NOSE, LEVEL 5; NOT FOUND AT TRIMMING

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3728	Group: 2	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 100 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 18APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 18APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

NOSE, LEVEL 1;
Infiltration, Mixed Cell; minimal
Hyperplasia; epithelial; minimal

The following tissues were within normal limits:

NOSE, LEVEL 2 NOSE, LEVEL 3 NOSE, LEVEL 4

The following tissues have not been examined:

NOSE, LEVEL 5; NOT FOUND AT TRIMMING

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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Date: 29-Dec-2011 10:39

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3729	Group: 2	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 100 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 18APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 18APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations:Correlated with:

LYMPH NODE, MANDIBULAR;
Dark Red (TGL) LYMPH NODE, MANDIBULAR; Erythrophagocytosis; mild (H)

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

LYMPH NODE, MANDIBULAR;
Erythrophagocytosis; mild LYMPH NODE, MANDIBULAR; Dark Red (G)

NOSE, LEVEL 3;
Hemorrhage; peracute; minimal

NOSE, LEVEL 5;
Hemorrhage; peracute; minimal

The following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 4
---------------	---------------	---------------

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3730	Group: 2	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 100 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 18APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 18APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

NOSE, LEVEL 1;
Hyperplasia; epithelial; minimal

The following tissues were within normal limits:

NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
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Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3731	Group: 2	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 100 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 19APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 19APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations: NoneThe following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
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Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3732	Group: 2	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 100 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 19APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 19APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations: NoneThe following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
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Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3733	Group: 2	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 100 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 19APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 19APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations: NoneThe following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
---------------	---------------	---------------	---------------	---------------

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3734	Group: 2	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 100 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 19APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 19APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations: NoneThe following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
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Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3735	Group: 2	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 100 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 19APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 19APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations: NoneThe following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
---------------	---------------	---------------	---------------	---------------

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3851	Group: 2	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 100 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 20APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 20APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations:Correlated with:

LYMPH NODE, MANDIBULAR;
Red (TGL) LYMPH NODE, MANDIBULAR; Erythrophagocytosis; mild (H)

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

LYMPH NODE, MANDIBULAR;
Erythrophagocytosis; mild LYMPH NODE, MANDIBULAR; Red (G)

The following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
---------------	---------------	---------------	---------------	---------------

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3852	Group: 2	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 100 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 20APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 20APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations: NoneThe following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
---------------	---------------	---------------	---------------	---------------

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3853	Group: 2	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 100 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 20APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 20APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations: NoneThe following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
---------------	---------------	---------------	---------------	---------------

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3854	Group: 2	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 100 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 20APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 20APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations: NoneThe following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
---------------	---------------	---------------	---------------	---------------

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3855	Group: 2	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 100 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 20APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 20APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations: NoneThe following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
---------------	---------------	---------------	---------------	---------------

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3856	Group: 2	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 100 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 21APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 21APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations: NoneThe following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
---------------	---------------	---------------	---------------	---------------

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3857	Group: 2	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 100 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 21APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 21APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations: NoneThe following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
---------------	---------------	---------------	---------------	---------------

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3858	Group: 2	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 100 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 21APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 21APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations: NoneThe following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
---------------	---------------	---------------	---------------	---------------

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3859	Group: 2	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 100 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 21APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 21APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations: NoneThe following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
---------------	---------------	---------------	---------------	---------------

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3860	Group: 2	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 100 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 21APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 21APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations: NoneThe following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
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Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3801	Group: 3	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 500 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 18APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 18APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations: NoneThe following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
---------------	---------------	---------------	---------------	---------------

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3802	Group: 3	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 500 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 18APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 18APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations: NoneThe following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
---------------	---------------	---------------	---------------	---------------

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3803	Group: 3	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 500 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 18APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 18APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations: NoneThe following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
---------------	---------------	---------------	---------------	---------------

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3804	Group: 3	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 500 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 18APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 18APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations: NoneThe following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
---------------	---------------	---------------	---------------	---------------

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3805	Group: 3	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 500 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 18APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 18APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

NOSE, LEVEL 2;
Depletion; Goblet Cell; minimal

The following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
---------------	---------------	---------------	---------------

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3807	Group: 3	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 500 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 19APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 19APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

NOSE, LEVEL 2;
Depletion; Goblet Cell; minimal

The following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
---------------	---------------	---------------	---------------

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3808	Group: 3	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 500 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 19APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 19APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations: NoneThe following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
---------------	---------------	---------------	---------------	---------------

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3809	Group: 3	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 500 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 19APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 19APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

NOSE, LEVEL 2;
Depletion; Goblet Cell; minimal

The following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
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Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3810	Group: 3	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 500 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 19APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 19APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

NOSE, LEVEL 2;
Depletion; Goblet Cell; minimal

The following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
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Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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Pathology - Individual Animal Data (Concise Edition)

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3926	Group: 3	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 500 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 20APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 20APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations: NoneThe following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
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Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3927	Group: 3	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 500 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 20APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 20APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

NOSE, LEVEL 2;
Depletion; Goblet Cell; mild

The following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
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Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3928	Group: 3	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 500 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 20APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 20APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

NOSE, LEVEL 2;
Depletion; Goblet Cell; mild

The following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
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Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3929	Group: 3	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 500 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 20APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 20APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

NOSE, LEVEL 2;
Depletion; Goblet Cell; minimal

The following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
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Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3930	Group: 3	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 500 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 20APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 20APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations: NoneThe following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
---------------	---------------	---------------	---------------	---------------

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3931	Group: 3	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 500 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 21APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 21APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations: NoneThe following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
---------------	---------------	---------------	---------------	---------------

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3932	Group: 3	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 500 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 21APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 21APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations: NoneThe following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
---------------	---------------	---------------	---------------	---------------

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3933	Group: 3	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 500 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 21APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 21APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

NOSE, LEVEL 2;
Depletion; Goblet Cell; minimal

The following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
---------------	---------------	---------------	---------------

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3934	Group: 3	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 500 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 21APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 21APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations: NoneThe following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 2	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
---------------	---------------	---------------	---------------	---------------

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3935	Group: 3	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 500 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 21APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 21APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

NOSE, LEVEL 2;
Depletion; Goblet Cell; minimal

The following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
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Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 12250	Group: 3	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 500 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 19APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 19APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

NOSE, LEVEL 2;
Depletion; Goblet Cell; minimal

The following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 3	NOSE, LEVEL 4	NOSE, LEVEL 5
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Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3751	Group: 4	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 5000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 18APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 18APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:NOSE, LEVEL 2;
Depletion; Goblet Cell; mildNOSE, LEVEL 3;
Hyperplasia; Olfactory Epithelium; minimalNOSE, LEVEL 4;
Hyperplasia; Olfactory Epithelium; mildNOSE, LEVEL 5;
Hyperplasia; Olfactory Epithelium; mildThe following tissues were within normal limits:

NOSE, LEVEL 1

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3752	Group: 4	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 5000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 18APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 18APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:NOSE, LEVEL 2;
Depletion; Goblet Cell; mildNOSE, LEVEL 3;
Hyperplasia; Olfactory Epithelium; minimalNOSE, LEVEL 4;
Hyperplasia; Olfactory Epithelium; mild
Vacuolation; Respiratory Epithelium; minimalNOSE, LEVEL 5;
Hyperplasia; Olfactory Epithelium; mildThe following tissues were within normal limits:

NOSE, LEVEL 1

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3753	Group: 4	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 5000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 18APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 18APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

NOSE, LEVEL 2;
Depletion; Goblet Cell; mildNOSE, LEVEL 3;
Hyperplasia; Olfactory Epithelium; minimalNOSE, LEVEL 4;
Hyperplasia; Olfactory Epithelium; mildNOSE, LEVEL 5;
Hyperplasia; Olfactory Epithelium; mild

The following tissues were within normal limits:

NOSE, LEVEL 1

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3754	Group: 4	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 5000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 18APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 18APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

NOSE, LEVEL 2;
Depletion; Goblet Cell; mildNOSE, LEVEL 3;
Hyperplasia; Olfactory Epithelium; mildNOSE, LEVEL 4;
Hyperplasia; Olfactory Epithelium; moderateNOSE, LEVEL 5;
Hyperplasia; Olfactory Epithelium; mild

The following tissues were within normal limits:

NOSE, LEVEL 1

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3755	Group: 4	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 5000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 18APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 18APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations:Correlated with:

LYMPH NODE, MANDIBULAR;
Dark Red (TGL) LYMPH NODE, MANDIBULAR; Erythrophagocytosis; mild (H)

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

LYMPH NODE, MANDIBULAR;
Erythrophagocytosis; mild LYMPH NODE, MANDIBULAR; Dark Red (G)

NOSE, LEVEL 2;
Depletion; Goblet Cell; mild

NOSE, LEVEL 4;
Hemorrhage; peracute; moderate
Hyperplasia; Olfactory Epithelium; mild

NOSE, LEVEL 5;
Hemorrhage; peracute; mild
Hyperplasia; Olfactory Epithelium; moderate

The following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 3
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Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3756	Group: 4	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 5000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 19APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 19APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

NOSE, LEVEL 2;
Depletion; Goblet Cell; moderateNOSE, LEVEL 3;
Hyperplasia; Olfactory Epithelium; minimalNOSE, LEVEL 4;
Hyperplasia; Olfactory Epithelium; mildNOSE, LEVEL 5;
Hyperplasia; Olfactory Epithelium; moderate

The following tissues were within normal limits:

NOSE, LEVEL 1

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3757	Group: 4	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 5000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 19APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 19APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

NOSE, LEVEL 2;
Depletion; Goblet Cell; minimalNOSE, LEVEL 3;
Hyperplasia; Olfactory Epithelium; minimalNOSE, LEVEL 4;
Hyperplasia; Olfactory Epithelium; mildNOSE, LEVEL 5;
Hyperplasia; Olfactory Epithelium; moderate

The following tissues were within normal limits:

NOSE, LEVEL 1

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3758	Group: 4	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 5000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 19APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 19APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations:Correlated with:

KIDNEY;

Dilation (TGL): right, slight pelvic dilation KIDNEY; Hydronephrosis; mild (H)

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

KIDNEY;

Hydronephrosis; mild KIDNEY; Dilation (G)

NOSE, LEVEL 2;

Depletion; Goblet Cell; moderate

NOSE, LEVEL 3;

Hyperplasia; Olfactory Epithelium; mild

NOSE, LEVEL 4;

Hyperplasia; Olfactory Epithelium; moderate

NOSE, LEVEL 5;

Hyperplasia; Olfactory Epithelium; moderate

The following tissues were within normal limits:

NOSE, LEVEL 1

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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Testing Facility Study No. TQC00066

PTA019-01/00

Charles River Laboratories
Pathology - Individual Animal Data (Concise Edition)

Date: 29-Dec-2011 10:39

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3759	Group: 4	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 5000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 19APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 19APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

NOSE, LEVEL 2;
Depletion; Goblet Cell; mildNOSE, LEVEL 3;
Hyperplasia; Olfactory Epithelium; minimalNOSE, LEVEL 4;
Hyperplasia; Olfactory Epithelium; mildNOSE, LEVEL 5;
Hyperplasia; Olfactory Epithelium; moderate

The following tissues were within normal limits:

NOSE, LEVEL 1

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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Pathology - Individual Animal Data (Concise Edition)

Date: 29-Dec-2011 10:39

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3760	Group: 4	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 5000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 19APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 19APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:NOSE, LEVEL 2;
Depletion; Goblet Cell; mild
Vacuolation; Respiratory Epithelium; minimalNOSE, LEVEL 3;
Hyperplasia; Olfactory Epithelium; mildNOSE, LEVEL 4;
Hyperplasia; Olfactory Epithelium; moderateNOSE, LEVEL 5;
Hyperplasia; Olfactory Epithelium; moderateThe following tissues were within normal limits:

NOSE, LEVEL 1

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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Testing Facility Study No. TQC00066

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Date: 29-Dec-2011 10:39

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3951	Group: 4	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 5000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 20APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 20APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

NOSE, LEVEL 3;
Hyperplasia; Olfactory Epithelium; mild
Hyperostosis; unilateral; mildNOSE, LEVEL 4;
Hyperplasia; Olfactory Epithelium; moderate

The following tissues were within normal limits:

NOSE, LEVEL 1 NOSE, LEVEL 2

The following tissues have not been examined:

NOSE, LEVEL 5; NOT FOUND AT TRIMMING

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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Date: 29-Dec-2011 10:39

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3952	Group: 4	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 5000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 20APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 20APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

NOSE, LEVEL 2;
Depletion; Goblet Cell; mildNOSE, LEVEL 3;
Hyperplasia; Olfactory Epithelium; minimalNOSE, LEVEL 4;
Hyperplasia; Olfactory Epithelium; moderateNOSE, LEVEL 5;
Hyperplasia; Olfactory Epithelium; moderate

The following tissues were within normal limits:

NOSE, LEVEL 1

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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Date: 29-Dec-2011 10:39

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3953	Group: 4	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 5000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 20APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 20APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations:Correlated with:SKIN;

Hernia (TGL): umbilical hernia, first observed at necropsy, measuring 0.2 cm x 0.2 cm, skin surrounding umbilicus saved in NBF NO CORRELATION; No Correlating Lesion (H)

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:NOSE, LEVEL 2;

Depletion; Goblet Cell; moderate

NOSE, LEVEL 3;

Hyperplasia; Olfactory Epithelium; mild

NOSE, LEVEL 4;

Hyperplasia; Olfactory Epithelium; moderate

NOSE, LEVEL 5;

Hyperplasia; Olfactory Epithelium; moderate

NO CORRELATION;

No Correlating Lesion SKIN; Hernia (G)

The following tissues were within normal limits:NOSE, LEVEL 1

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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Pathology - Individual Animal Data (Concise Edition)

Date: 29-Dec-2011 10:39

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3953 Group: 4 Sex: Female (continued)

The following tissues have not been examined:

SKIN; NOT FOUND AT TRIMMING

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3954	Group: 4	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 5000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 20APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 20APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

NOSE, LEVEL 2;
Depletion; Goblet Cell; minimalNOSE, LEVEL 3;
Hyperplasia; Olfactory Epithelium; mildNOSE, LEVEL 4;
Hyperplasia; Olfactory Epithelium; moderateNOSE, LEVEL 5;
Hyperplasia; Olfactory Epithelium; moderate

The following tissues were within normal limits:

NOSE, LEVEL 1

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3955	Group: 4	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 5000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 20APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 20APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

NOSE, LEVEL 2;
Depletion; Goblet Cell; minimalNOSE, LEVEL 3;
Hyperplasia; Olfactory Epithelium; minimalNOSE, LEVEL 4;
Hyperplasia; Olfactory Epithelium; mildNOSE, LEVEL 5;
Hyperplasia; Olfactory Epithelium; mild

The following tissues were within normal limits:

NOSE, LEVEL 1

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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Date: 29-Dec-2011 10:39

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3956	Group: 4	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 5000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 21APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 21APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

NOSE, LEVEL 2;
Depletion; Goblet Cell; mildNOSE, LEVEL 3;
Hyperplasia; Olfactory Epithelium; mildNOSE, LEVEL 4;
Hyperplasia; Olfactory Epithelium; moderateNOSE, LEVEL 5;
Hyperplasia; Olfactory Epithelium; mild

The following tissues were within normal limits:

NOSE, LEVEL 1

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3957	Group: 4	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 5000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 21APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 21APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:NOSE, LEVEL 2;
Depletion; Goblet Cell; mildNOSE, LEVEL 3;
Hyperplasia; Olfactory Epithelium; minimalNOSE, LEVEL 4;
Hyperplasia; Olfactory Epithelium; mildNOSE, LEVEL 5;
Hyperplasia; Olfactory Epithelium; mildThe following tissues were within normal limits:

NOSE, LEVEL 1

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3958	Group: 4	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 5000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 21APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 21APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

NOSE, LEVEL 3;
Hyperplasia; Olfactory Epithelium; minimalNOSE, LEVEL 4;
Hyperplasia; Olfactory Epithelium; mildNOSE, LEVEL 5;
Hyperplasia; Olfactory Epithelium; moderate

The following tissues were within normal limits:

NOSE, LEVEL 1	NOSE, LEVEL 2
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Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3959	Group: 4	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 5000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 21APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 21APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

NOSE, LEVEL 2;
Depletion; Goblet Cell; minimalNOSE, LEVEL 4;
Hyperplasia; Olfactory Epithelium; minimalNOSE, LEVEL 5;
Hyperplasia; Olfactory Epithelium; mild

The following tissues were within normal limits:

NOSE, LEVEL 1 NOSE, LEVEL 3

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3960	Group: 4	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 5000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 21APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 21APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:NOSE, LEVEL 2;
Depletion; Goblet Cell; minimalNOSE, LEVEL 3;
Hyperplasia; Olfactory Epithelium; minimalNOSE, LEVEL 4;
Hyperplasia; Olfactory Epithelium; mildNOSE, LEVEL 5;
Hyperplasia; Olfactory Epithelium; moderateThe following tissues were within normal limits:

NOSE, LEVEL 1

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3701	Group: 5	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 10000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 18APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 18APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

LIVER;

Infiltration, Mononuclear Cell; minimal

NOSE, LEVEL 2;

Depletion; Goblet Cell; minimal

NOSE, LEVEL 3;

Hyperplasia; Olfactory Epithelium; minimal

NOSE, LEVEL 4;

Hyperplasia; Olfactory Epithelium; mild

NOSE, LEVEL 5;

Hyperplasia; Olfactory Epithelium; moderate

NERVE, OPTIC;

One of pair was available for evaluation

URETER;

One of pair was available for evaluation

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3701 Group: 5 Sex: Male (continued)

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BRAIN	COAGULATING GLAND	EPIDIDYMIS
ESOPHAGUS	EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON	INTESTINE, DUODENUM
INTESTINE, ILEUM	INTESTINE, JEJUNUM	INTESTINE, RECTUM	KIDNEY	LARYNX	LUNG	LYMPH NODE, MANDIBULAR
LYMPH NODE, MESENTERIC		NOSE, LEVEL 1	NERVE, OPTIC	NERVE, SCIATIC	PANCREAS	PEYERS PATCH
PHARYNX	PITUITARY GLAND	PROSTATE GLAND	SALIVARY GLAND	SEMINAL VESICLE	SKELETAL MUSCLE	SKIN, MAMMARY
SPINAL CORD	SPLEEN	STOMACH	TESTIS	THYMUS	THYROID GLAND	TONGUE
TRACHEA	URETER	URINARY BLADDER				

The following tissues have not been examined:

BONE, STERNUM; NOT COLLECTED AT NECROPSY
PARATHYROID GLAND; NOT PRESENT ON SLIDE

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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Date: 29-Dec-2011 10:39

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3703	Group: 5	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 10000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 18APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 18APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:NOSE, LEVEL 2;
Depletion; Goblet Cell; moderateNOSE, LEVEL 3;
Hyperplasia; Olfactory Epithelium; mildNOSE, LEVEL 4;
Hyperplasia; Olfactory Epithelium; mildNOSE, LEVEL 5;
Hyperplasia; Olfactory Epithelium; moderateNERVE, OPTIC;
One of pair was available for evaluationPANCREAS;
Apoptosis; minimal
Infiltration, Mononuclear Cell; minimalPARATHYROID GLAND;
One of pair was available for evaluation

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3703 Group: 5 Sex: Male (continued)

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BRAIN	COAGULATING GLAND	EPIDIDYMIS
ESOPHAGUS	EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON	INTESTINE, DUODENUM
INTESTINE, ILEUM	INTESTINE, JEJUNUM	INTESTINE, RECTUM	KIDNEY	LARYNX	LIVER	LUNG
LYMPH NODE, MANDIBULAR		LYMPH NODE, MESENTERIC		NOSE, LEVEL 1	NERVE, OPTIC	NERVE, SCIATIC
PARATHYROID GLAND	PEYERS PATCH	PHARYNX	PITUITARY GLAND	PROSTATE GLAND	SALIVARY GLAND	SEMINAL VESICLE
SKELETAL MUSCLE	SKIN, MAMMARY	SPINAL CORD	SPLEEN	STOMACH	TESTIS	THYMUS
THYROID GLAND	TONGUE	TRACHEA	URETER	URINARY BLADDER		

The following tissues have not been examined:

BONE, STERNUM; NOT COLLECTED AT NECROPSY

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3704	Group: 5	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 10000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 18APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 18APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

LIVER;

Infiltration, Mononuclear Cell; minimal

NOSE, LEVEL 2;

Depletion; Goblet Cell; moderate

NOSE, LEVEL 3;

Hyperplasia; Olfactory Epithelium; minimal

NOSE, LEVEL 4;

Hyperplasia; Olfactory Epithelium; moderate
Vacuolation; Respiratory Epithelium; mild

NOSE, LEVEL 5;

Hyperplasia; Olfactory Epithelium; moderate

URETER;

One of pair was available for evaluation

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BONE, STERNUM	BRAIN	COAGULATING GLAND
EPIDIDYMIS	ESOPHAGUS	EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON
INTESTINE, DUODENUM	INTESTINE, ILEUM	INTESTINE, JEJUNUM	INTESTINE, RECTUM	KIDNEY	LARYNX	LUNG
LYMPH NODE, MANDIBULAR		LYMPH NODE, MESENTERIC		NOSE, LEVEL 1	NERVE, SCIATIC	PANCREAS

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3704 Group: 5 Sex: Male (continued)

The following tissues were within normal limits: (continued)

PEYERS PATCH	PHARYNX	PITUITARY GLAND	PROSTATE GLAND	SALIVARY GLAND	SEMINAL VESICLE	SKELETAL MUSCLE
SKIN, MAMMARY	SPINAL CORD	SPLEEN	STOMACH	TESTIS	THYMUS	THYROID GLAND
TONGUE	TRACHEA	URETER	URINARY BLADDER			

The following tissues have not been examined:

NERVE, OPTIC; NOT PRESENT ON SLIDE
PARATHYROID GLAND; NOT PRESENT ON SLIDE

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3705	Group: 5	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 10000 ppm Route: Oral Diet Study Type: Toxicity
 Date of Death : 18APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
 Date of Necropsy: 18APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

NOSE, LEVEL 2;
Depletion; Goblet Cell; mild

NOSE, LEVEL 3;
Hyperplasia; Olfactory Epithelium; minimal

NOSE, LEVEL 4;
Hyperplasia; Olfactory Epithelium; mild

NOSE, LEVEL 5;
Hyperplasia; Olfactory Epithelium; moderate

PANCREAS;
Apoptosis; mild

URETER;
One of pair was available for evaluation

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BRAIN	COAGULATING GLAND	EPIDIDYMIS
ESOPHAGUS	EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON	INTESTINE, DUODENUM
INTESTINE, ILEUM	INTESTINE, JEJUNUM	INTESTINE, RECTUM	KIDNEY	LARYNX	LIVER	LUNG
LYMPH NODE, MANDIBULAR		LYMPH NODE, MESENTERIC		NOSE, LEVEL 1	NERVE, OPTIC	NERVE, SCIATIC
PEYERS PATCH	PHARYNX	PITUITARY GLAND	PROSTATE GLAND	SALIVARY GLAND	SEMINAL VESICLE	SKELETAL MUSCLE

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3705 Group: 5 Sex: Male (continued)

The following tissues were within normal limits: (continued)

SKIN, MAMMARY TONGUE	SPINAL CORD TRACHEA	SPLEEN URETER	STOMACH URINARY BLADDER	TESTIS	THYMUS	THYROID GLAND
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The following tissues have not been examined:

BONE, STERNUM; NOT COLLECTED AT NECROPSY
PARATHYROID GLAND; NOT PRESENT ON SLIDE

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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Pathology - Individual Animal Data (Concise Edition)

Date: 29-Dec-2011 10:39

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3706	Group: 5	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 10000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 19APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 19APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations:Correlated with:

KIDNEY;

Dilation (TGL): right, slight pelvic dilation KIDNEY; Hydronephrosis; mild (H)

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

INTESTINE, CECUM;

Infiltration, Mononuclear Cell; mild

INTESTINE, RECTUM;

Infiltration, Mononuclear Cell; minimal

KIDNEY;

Hydronephrosis; mild KIDNEY; Dilation (G)
Nephropathy; minimal

NOSE, LEVEL 2;

Depletion; Goblet Cell; moderate

NOSE, LEVEL 3;

Hyperplasia; Olfactory Epithelium; mild

NOSE, LEVEL 4;

Hyperplasia; Olfactory Epithelium; mild

NOSE, LEVEL 5;

Hyperplasia; Olfactory Epithelium; moderate

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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Date: 29-Dec-2011 10:39

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3706 Group: 5 Sex: Male (continued)

Histo Pathology Observations: (continued)

NERVE, OPTIC;

One of pair was available for evaluation

PARATHYROID GLAND;

One of pair was available for evaluation

PROSTATE GLAND;

Infiltration, Mononuclear Cell; minimal

URETER;

One of pair was available for evaluation

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BONE, STERNUM	BRAIN	COAGULATING GLAND
EPIDIDYMIS	ESOPHAGUS	EYE	HARDERIAN GLAND	HEART	INTESTINE, COLON	INTESTINE, DUODENUM
INTESTINE, ILEUM	INTESTINE, JEJUNUM	LARYNX	LIVER	LUNG	LYMPH NODE, MANDIBULAR	
LYMPH NODE, MESENTERIC		NOSE, LEVEL 1	NERVE, OPTIC	NERVE, SCIATIC	PANCREAS	PARATHYROID GLAND
PHARYNX	PITUITARY GLAND	SALIVARY GLAND	SEMINAL VESICLE	SKELETAL MUSCLE	SKIN, MAMMARY	SPINAL CORD
SPLEEN	STOMACH	TESTIS	THYMUS	THYROID GLAND	TONGUE	TRACHEA
URETER	URINARY BLADDER					

The following tissues have not been examined:

PEYERS PATCH; NOT PRESENT ON SLIDE

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3707	Group: 5	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 10000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 19APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 19APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations:Correlated with:

SKIN;

Hernia (TGL): umbilical hernia, skin surrounding umbilicus saved in NBF NO CORRELATION; No Correlating Lesion (H)

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

INTESTINE, CECUM;

Infiltration, Mononuclear Cell; minimal

KIDNEY;

Nephropathy; minimal

NOSE, LEVEL 2;

Depletion; Goblet Cell; moderate

NOSE, LEVEL 3;

Hyperplasia; Olfactory Epithelium; minimal

NOSE, LEVEL 4;

Hyperplasia; Olfactory Epithelium; moderate

NOSE, LEVEL 5;

Hyperplasia; Olfactory Epithelium; mild

PROSTATE GLAND;

Infiltration, Mononuclear Cell; minimal

NO CORRELATION;

No Correlating Lesion SKIN; Hernia (G)

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3707 Group: 5 Sex: Male (continued)

Histo Pathology Observations: (continued)

SKIN;

Discontinuous normal muscle on slide.

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BONE, STERNUM	BRAIN	COAGULATING GLAND
EPIDIDYMIS	ESOPHAGUS	EYE	HARDERIAN GLAND	HEART	INTESTINE, COLON	INTESTINE, DUODENUM
INTESTINE, ILEUM	INTESTINE, JEJUNUM	INTESTINE, RECTUM	LARYNX	LIVER	LUNG	LYMPH NODE, MANDIBULAR
LYMPH NODE, MESENTERIC		NOSE, LEVEL 1	NERVE, OPTIC	NERVE, SCIATIC	PANCREAS	PEYERS PATCH
PHARYNX	PITUITARY GLAND	SALIVARY GLAND	SEMINAL VESICLE	SKELETAL MUSCLE	SKIN, MAMMARY	SPINAL CORD
SPLEEN	STOMACH	TESTIS	THYMUS	THYROID GLAND	TONGUE	TRACHEA
URINARY BLADDER						

The following tissues have not been examined:

PARATHYROID GLAND; NOT PRESENT ON SLIDE
URETER; NOT PRESENT ON SLIDE
SKIN; NOT FOUND AT TRIMMING

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3708	Group: 5	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 10000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 19APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 19APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

LARYNX;

Infiltration, Mononuclear Cell; mild

LIVER;

Infiltration, Mononuclear Cell; minimal
Tension Lipidosis; minimal

NOSE, LEVEL 2;

Depletion; Goblet Cell; mild

NOSE, LEVEL 3;

Hyperplasia; Olfactory Epithelium; minimal

NOSE, LEVEL 4;

Hyperplasia; Olfactory Epithelium; mild

NOSE, LEVEL 5;

Hyperplasia; Olfactory Epithelium; moderate

PARATHYROID GLAND;

One of pair was available for evaluation

PROSTATE GLAND;

Infiltration, Mononuclear Cell; minimal

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3708 Group: 5 Sex: Male (continued)

Histo Pathology Observations: (continued)

URETER;

One of pair was available for evaluation

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BONE, STERNUM	BRAIN	COAGULATING GLAND
EPIDIDYMIS	ESOPHAGUS	EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON
INTESTINE, DUODENUM	INTESTINE, ILEUM	INTESTINE, JEJUNUM	INTESTINE, RECTUM	KIDNEY	LUNG	LYMPH NODE, MANDIBULAR
LYMPH NODE, MESENTERIC		NOSE, LEVEL 1	NERVE, OPTIC	NERVE, SCIATIC	PANCREAS	PARATHYROID GLAND
PHARYNX	PITUITARY GLAND	SALIVARY GLAND	SEMINAL VESICLE	SKELETAL MUSCLE	SKIN, MAMMARY	SPINAL CORD
SPLEEN	STOMACH	TESTIS	THYMUS	THYROID GLAND	TONGUE	TRACHEA
URETER	URINARY BLADDER					

The following tissues have not been examined:

PEYERS PATCH; NOT PRESENT ON SLIDE

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3709	Group: 5	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 10000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 19APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 19APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:INTESTINE, RECTUM;
Infiltration, Mononuclear Cell; mildLARYNX;
Infiltration, Mononuclear Cell; minimalLYMPH NODE, MANDIBULAR;
Hyperplasia; minimalNOSE, LEVEL 2;
Depletion; Goblet Cell; minimalNOSE, LEVEL 3;
Hyperplasia; Olfactory Epithelium; mildNOSE, LEVEL 4;
Hyperplasia; Olfactory Epithelium; mildNOSE, LEVEL 5;
Hyperplasia; Olfactory Epithelium; moderatePEYERS PATCH;
Hyperplasia; mild

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3709 Group: 5 Sex: Male (continued)

Histo Pathology Observations: (continued)PROSTATE GLAND;
Infiltration, Mononuclear Cell; minimal

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BONE, STERNUM	BRAIN	COAGULATING GLAND
EPIDIDYMIS	ESOPHAGUS	EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON
INTESTINE, DUODENUM	INTESTINE, ILEUM	INTESTINE, JEJUNUM	KIDNEY	LIVER	LUNG	LYMPH NODE, MESENTERIC
NOSE, LEVEL 1	NERVE, SCIATIC	PANCREAS	PHARYNX	PITUITARY GLAND	SALIVARY GLAND	SEMINAL VESICLE
SKELETAL MUSCLE	SKIN, MAMMARY	SPINAL CORD	SPLEEN	STOMACH	TESTIS	THYMUS
THYROID GLAND	TONGUE	TRACHEA	URETER	URINARY BLADDER		

The following tissues have not been examined:

NERVE, OPTIC; NOT PRESENT ON SLIDE
PARATHYROID GLAND; NOT PRESENT ON SLIDE

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3710	Group: 5	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 10000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 19APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 19APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:ADRENAL GLAND;
Cortex and one medulla were available for evaluationNOSE, LEVEL 3;
Hyperplasia; Olfactory Epithelium; minimalNOSE, LEVEL 4;
Hyperplasia; Olfactory Epithelium; moderateNOSE, LEVEL 5;
Hyperplasia; Olfactory Epithelium; mildPANCREAS;
Hyperplasia; Islet Cell; minimal
Infiltration, Mononuclear Cell; mildURETER;
One of pair was available for evaluation

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BONE, STERNUM	BRAIN	COAGULATING GLAND
EPIDIDYMIS	ESOPHAGUS	EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON
INTESTINE, DUODENUM	INTESTINE, ILEUM	INTESTINE, JEJUNUM	INTESTINE, RECTUM	KIDNEY	LARYNX	LIVER
LUNG	LYMPH NODE, MANDIBULAR		LYMPH NODE, MESENTERIC		NOSE, LEVEL 1	NOSE, LEVEL 2

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3710 Group: 5 Sex: Male (continued)

The following tissues were within normal limits: (continued)

NERVE, OPTIC	NERVE, SCIATIC	PARATHYROID GLAND	PEYERS PATCH	PHARYNX	PITUITARY GLAND	PROSTATE GLAND
SALIVARY GLAND	SEMINAL VESICLE	SKELETAL MUSCLE	SKIN, MAMMARY	SPINAL CORD	SPLEEN	STOMACH
TESTIS	THYMUS	THYROID GLAND	TONGUE	TRACHEA	URETER	URINARY BLADDER

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3876	Group: 5	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 10000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 20APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 20APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

LARYNX;

Infiltration, Mixed Cell; moderate

NOSE, LEVEL 2;

Depletion; Goblet Cell; moderate

NOSE, LEVEL 3;

Hyperplasia; Olfactory Epithelium; mild

NOSE, LEVEL 4;

Hyperplasia; Olfactory Epithelium; moderate

NOSE, LEVEL 5;

Hyperplasia; Olfactory Epithelium; moderate

PANCREAS;

Infiltration, Mononuclear Cell; minimal

PARATHYROID GLAND;

One of pair was available for evaluation

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3876 Group: 5 Sex: Female (continued)

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BONE, STERNUM	BRAIN	CERVIX
ESOPHAGUS	EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON	INTESTINE, DUODENUM
INTESTINE, ILEUM	INTESTINE, JEJUNUM	INTESTINE, RECTUM	KIDNEY	LIVER	LUNG	LYMPH NODE, MANDIBULAR
LYMPH NODE, MESENTERIC		MAMMARY GLAND	NOSE, LEVEL 1	NERVE, OPTIC	NERVE, SCIATIC	OVARY
OVIDUCT	PARATHYROID GLAND	PEYERS PATCH	PHARYNX	PITUITARY GLAND	SALIVARY GLAND	SKELETAL MUSCLE
SKIN, MAMMARY	SPINAL CORD	SPLEEN	STOMACH	THYMUS	THYROID GLAND	TONGUE
TRACHEA	URETER	URINARY BLADDER	UTERUS	VAGINA		

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3877	Group: 5	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 10000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 20APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 20APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

LIVER;

Vacuolation; Periportal; hepatocellular; mild
Infiltration, Mononuclear Cell; minimal

NOSE, LEVEL 2;

Depletion; Goblet Cell; moderate

NOSE, LEVEL 3;

Hyperplasia; Olfactory Epithelium; moderate

NOSE, LEVEL 4;

Hyperplasia; Olfactory Epithelium; moderate

NOSE, LEVEL 5;

Hyperplasia; Olfactory Epithelium; moderate

PARATHYROID GLAND;

One of pair was available for evaluation

PEYERS PATCH;

Hyperplasia; mild: Evaluated on Slide 13 in rectum section.

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3877 Group: 5 Sex: Female (continued)

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BONE, STERNUM	BRAIN	CERVIX
ESOPHAGUS	EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON	INTESTINE, DUODENUM
INTESTINE, ILEUM	INTESTINE, JEJUNUM	INTESTINE, RECTUM	KIDNEY	LARYNX	LUNG	LYMPH NODE, MANDIBULAR
LYMPH NODE, MESENTERIC		MAMMARY GLAND	NOSE, LEVEL 1	NERVE, OPTIC	NERVE, SCIATIC	OVARY
OVIDUCT	PANCREAS	PARATHYROID GLAND	PHARYNX	PITUITARY GLAND	SALIVARY GLAND	SKELETAL MUSCLE
SKIN, MAMMARY	SPINAL CORD	SPLEEN	STOMACH	THYMUS	THYROID GLAND	TONGUE
TRACHEA	URETER	URINARY BLADDER	UTERUS	VAGINA		

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3878	Group: 5	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 10000 ppm Route: Oral Diet Study Type: Toxicity
 Date of Death : 20APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
 Date of Necropsy: 20APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

NOSE, LEVEL 2;
Depletion; Goblet Cell; moderate

NOSE, LEVEL 3;
Hyperplasia; Olfactory Epithelium; mild

NOSE, LEVEL 4;
Hyperplasia; Olfactory Epithelium; mild

NOSE, LEVEL 5;
Hyperplasia; Olfactory Epithelium; moderate

OVARY;
Cyst; Follicle; moderate

URETER;
One of pair was available for evaluation

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BONE, STERNUM	BRAIN	CERVIX
ESOPHAGUS	EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON	INTESTINE, DUODENUM
INTESTINE, ILEUM	INTESTINE, JEJUNUM	INTESTINE, RECTUM	KIDNEY	LARYNX	LIVER	LUNG
LYMPH NODE, MANDIBULAR		LYMPH NODE, MESENTERIC		MAMMARY GLAND	NOSE, LEVEL 1	NERVE, OPTIC
NERVE, SCIATIC	OVIDUCT	PANCREAS	PARATHYROID GLAND	PHARYNX	PITUITARY GLAND	SALIVARY GLAND

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3878 Group: 5 Sex: Female (continued)

The following tissues were within normal limits: (continued)

SKIN, MAMMARY	SPINAL CORD	SPLEEN	STOMACH	THYMUS	THYROID GLAND	TONGUE
TRACHEA	URETER	URINARY BLADDER	UTERUS	VAGINA		

The following tissues have not been examined:

PEYERS PATCH; NOT PRESENT ON SLIDE
SKELETAL MUSCLE; NOT FOUND AT TRIMMING

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3879	Group: 5	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 10000 ppm Route: Oral Diet Study Type: Toxicity
 Date of Death : 20APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
 Date of Necropsy: 20APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

NOSE, LEVEL 2;
Depletion; Goblet Cell; moderate

NOSE, LEVEL 3;
Hyperplasia; Olfactory Epithelium; mild

NOSE, LEVEL 4;
Hyperplasia; Olfactory Epithelium; mild

NOSE, LEVEL 5;
Hyperplasia; Olfactory Epithelium; mild

NERVE, OPTIC;
One of pair was available for evaluation

OVARY;
Cyst; Follicle; mild

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BONE, STERNUM	BRAIN	CERVIX
ESOPHAGUS	EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON	INTESTINE, DUODENUM
INTESTINE, ILEUM	INTESTINE, JEJUNUM	INTESTINE, RECTUM	KIDNEY	LARYNX	LIVER	LUNG
LYMPH NODE, MANDIBULAR		LYMPH NODE, MESENTERIC		MAMMARY GLAND	NOSE, LEVEL 1	NERVE, OPTIC
NERVE, SCIATIC	OVIDUCT	PANCREAS	PARATHYROID GLAND	PEYERS PATCH	PHARYNX	PITUITARY GLAND

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3879 Group: 5 Sex: Female (continued)

The following tissues were within normal limits: (continued)

SALIVARY GLAND	SKELETAL MUSCLE	SKIN, MAMMARY	SPINAL CORD	SPLEEN	STOMACH	THYMUS
THYROID GLAND	TONGUE	TRACHEA	URETER	URINARY BLADDER	UTERUS	VAGINA

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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Pathology - Individual Animal Data (Concise Edition)

Date: 29-Dec-2011 10:39

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3880	Group: 5	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 10000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 20APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 20APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:BONE MARROW, FEMUR;
Hypocellularity; minimalLIVER;
Vacuolation; Periportal; hepatocellular; minimalNOSE, LEVEL 2;
Depletion; Goblet Cell; moderateNOSE, LEVEL 3;
Hyperplasia; Olfactory Epithelium; mildNOSE, LEVEL 4;
Hyperplasia; Olfactory Epithelium; mildNOSE, LEVEL 5;
Hyperplasia; Olfactory Epithelium; mild

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE, FEMUR	BONE, STERNUM	BRAIN	CERVIX	ESOPHAGUS
EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON	INTESTINE, DUODENUM	INTESTINE, ILEUM
INTESTINE, JEJUNUM	INTESTINE, RECTUM	KIDNEY	LARYNX	LUNG	LYMPH NODE, MANDIBULAR	
LYMPH NODE, MESENTERIC		MAMMARY GLAND	NOSE, LEVEL 1	NERVE, OPTIC	NERVE, SCIATIC	OVARY
OVIDUCT	PANCREAS	PEYERS PATCH	PHARYNX	PITUITARY GLAND	SALIVARY GLAND	SKELETAL MUSCLE

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3880 Group: 5 Sex: Female (continued)

The following tissues were within normal limits: (continued)

SKIN, MAMMARY	SPINAL CORD	SPLEEN	STOMACH	THYMUS	TONGUE	TRACHEA
URETER	URINARY BLADDER	UTERUS	VAGINA			

The following tissues have not been examined:

PARATHYROID GLAND; NOT FOUND AT TRIMMING
THYROID GLAND; NOT FOUND AT TRIMMING

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3881	Group: 5	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 10000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 21APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 21APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

KIDNEY;

Cortex was available for evaluation

LIVER;

Vacuolation; Periportal; hepatocellular; minimal

NOSE, LEVEL 2;

Depletion; Goblet Cell; marked

NOSE, LEVEL 3;

Hyperplasia; Olfactory Epithelium; mild

NOSE, LEVEL 4;

Hyperplasia; Olfactory Epithelium; mild

NOSE, LEVEL 5;

Hyperplasia; Olfactory Epithelium; moderate

NERVE, OPTIC;

One of pair was available for evaluation

UTERUS;

Dilation; minimal

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3881 Group: 5 Sex: Female (continued)

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BONE, STERNUM	BRAIN	CERVIX
ESOPHAGUS	EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON	INTESTINE, DUODENUM
INTESTINE, ILEUM	INTESTINE, JEJUNUM	INTESTINE, RECTUM	KIDNEY	LARYNX	LUNG	LYMPH NODE, MANDIBULAR
LYMPH NODE, MESENTERIC		MAMMARY GLAND	NOSE, LEVEL 1	NERVE, OPTIC	NERVE, SCIATIC	OVARY
OVIDUCT	PANCREAS	PEYERS PATCH	PHARYNX	PITUITARY GLAND	SALIVARY GLAND	SKELETAL MUSCLE
SKIN, MAMMARY	SPINAL CORD	SPLEEN	STOMACH	THYMUS	TONGUE	TRACHEA
URETER	URINARY BLADDER	VAGINA				

The following tissues have not been examined:

PARATHYROID GLAND; NOT PRESENT ON SLIDE
THYROID GLAND; INSUFFICIENT TISSUE FOR EVALUATION

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3882	Group: 5	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 10000 ppm Route: Oral Diet Study Type: Toxicity
 Date of Death : 21APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
 Date of Necropsy: 21APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

NOSE, LEVEL 2;
Depletion; Goblet Cell; mild

NOSE, LEVEL 3;
Hyperplasia; Olfactory Epithelium; minimal

NOSE, LEVEL 4;
Hyperplasia; Olfactory Epithelium; moderate

NOSE, LEVEL 5;
Hyperplasia; Olfactory Epithelium; moderate

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BONE, STERNUM	BRAIN	CERVIX
ESOPHAGUS	EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON	INTESTINE, DUODENUM
INTESTINE, ILEUM	INTESTINE, JEJUNUM	INTESTINE, RECTUM	KIDNEY	LARYNX	LIVER	LUNG
LYMPH NODE, MANDIBULAR		LYMPH NODE, MESENTERIC		MAMMARY GLAND	NOSE, LEVEL 1	NERVE, OPTIC
NERVE, SCIATIC	OVARY	OVIDUCT	PANCREAS	PARATHYROID GLAND	PEYERS PATCH	PHARYNX
PITUITARY GLAND	SALIVARY GLAND	SKELETAL MUSCLE	SKIN, MAMMARY	SPINAL CORD	SPLEEN	STOMACH
THYMUS	THYROID GLAND	TONGUE	TRACHEA	URETER	URINARY BLADDER	UTERUS
VAGINA						

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3883	Group: 5	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 10000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 21APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 21APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

LIVER;

Vacuolation; Periportal; hepatocellular; minimal

NOSE, LEVEL 2;

Depletion; Goblet Cell; minimal

NOSE, LEVEL 3;

Hyperplasia; Olfactory Epithelium; minimal

NOSE, LEVEL 4;

Hyperplasia; Olfactory Epithelium; moderate

NOSE, LEVEL 5;

Hyperplasia; Olfactory Epithelium; moderate

OVIDUCT;

One of pair was available for evaluation

PARATHYROID GLAND;

One of pair was available for evaluation

URETER;

One of pair was available for evaluation

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3883 Group: 5 Sex: Female (continued)

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BONE, STERNUM	BRAIN	CERVIX
ESOPHAGUS	EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON	INTESTINE, DUODENUM
INTESTINE, ILEUM	INTESTINE, JEJUNUM	INTESTINE, RECTUM	KIDNEY	LARYNX	LUNG	LYMPH NODE, MANDIBULAR
LYMPH NODE, MESENTERIC		MAMMARY GLAND	NOSE, LEVEL 1	NERVE, SCIATIC	OVARY	OVIDUCT
PANCREAS	PARATHYROID GLAND	PEYERS PATCH	PHARYNX	PITUITARY GLAND	SALIVARY GLAND	SKELETAL MUSCLE
SKIN, MAMMARY	SPINAL CORD	SPLEEN	STOMACH	THYMUS	THYROID GLAND	TONGUE
TRACHEA	URETER	URINARY BLADDER	UTERUS	VAGINA		

The following tissues have not been examined:

NERVE, OPTIC; NOT PRESENT ON SLIDE

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3884	Group: 5	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 10000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 21APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 21APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

LIVER;

Vacuolation; Periportal; hepatocellular; minimal

NOSE, LEVEL 2;

Depletion; Goblet Cell; mild

NOSE, LEVEL 3;

Hyperplasia; Olfactory Epithelium; minimal

NOSE, LEVEL 4;

Hyperplasia; Olfactory Epithelium; moderate

NOSE, LEVEL 5;

Hyperplasia; Olfactory Epithelium; mild

NERVE, OPTIC;

One of pair was available for evaluation

URETER;

One of pair was available for evaluation

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3884 Group: 5 Sex: Female (continued)

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BONE, STERNUM	BRAIN	CERVIX
ESOPHAGUS	EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON	INTESTINE, DUODENUM
INTESTINE, ILEUM	INTESTINE, JEJUNUM	INTESTINE, RECTUM	KIDNEY	LARYNX	LUNG	LYMPH NODE, MANDIBULAR
LYMPH NODE, MESENTERIC		MAMMARY GLAND	NOSE, LEVEL 1	NERVE, OPTIC	NERVE, SCIATIC	OVARY
OVIDUCT	PANCREAS	PEYERS PATCH	PHARYNX	PITUITARY GLAND	SALIVARY GLAND	SKELETAL MUSCLE
SKIN, MAMMARY	SPINAL CORD	SPLEEN	STOMACH	THYMUS	THYROID GLAND	TONGUE
TRACHEA	URETER	URINARY BLADDER	UTERUS	VAGINA		

The following tissues have not been examined:

PARATHYROID GLAND; NOT PRESENT ON SLIDE

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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Date: 29-Dec-2011 10:39

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3885	Group: 5	Sex: Female	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 10000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 21APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 21APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

LIVER;

Vacuolation; Periportal; hepatocellular; mild

NOSE, LEVEL 2;

Depletion; Goblet Cell; moderate
Infiltration, Mixed Cell; mild

NOSE, LEVEL 3;

Hyperplasia; Olfactory Epithelium; mild
Infiltration, Mixed Cell; minimal

NOSE, LEVEL 4;

Hyperplasia; Olfactory Epithelium; mild

NOSE, LEVEL 5;

Hyperplasia; Olfactory Epithelium; moderate

NERVE, OPTIC;

One of pair was available for evaluation

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BONE, STERNUM	BRAIN	CERVIX
ESOPHAGUS	EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON	INTESTINE, DUODENUM
INTESTINE, ILEUM	INTESTINE, JEJUNUM	INTESTINE, RECTUM	KIDNEY	LARYNX	LUNG	LYMPH NODE, MANDIBULAR

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Date: 29-Dec-2011 10:39

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3885 Group: 5 Sex: Female (continued)

The following tissues were within normal limits: (continued)

LYMPH NODE, MESENTERIC		MAMMARY GLAND	NOSE, LEVEL 1	NERVE, OPTIC	NERVE, SCIATIC	OVARY
OVIDUCT	PANCREAS	PARATHYROID GLAND	PEYERS PATCH	PHARYNX	PITUITARY GLAND	SALIVARY GLAND
SKELETAL MUSCLE	SKIN, MAMMARY	SPINAL CORD	SPLEEN	STOMACH	THYMUS	THYROID GLAND
TONGUE	TRACHEA	URETER	URINARY BLADDER	UTERUS	VAGINA	

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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Date: 29-Dec-2011 10:39

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 18077	Group: 5	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 10000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 18APR2011 Study Day No. (Week): 91 (13) Mode of Death: SCHEDULE SACRIFICED
Date of Necropsy: 18APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations: None

Any remaining protocol required tissues, which have been examined, have no visible lesions

Histo Pathology Observations:

KIDNEY;

Hydronephrosis; minimal
Nephropathy; minimal

LARYNX;

Hyperplasia; epithelial; mild

LIVER;

Vacuolation; Periportal; hepatocellular; minimal

NOSE, LEVEL 2;

Depletion; Goblet Cell; minimal

NOSE, LEVEL 3;

Hyperplasia; Olfactory Epithelium; minimal

NOSE, LEVEL 4;

Hyperplasia; Olfactory Epithelium; mild

NOSE, LEVEL 5;

Hyperplasia; Olfactory Epithelium; minimal

NERVE, OPTIC;

One of pair was available for evaluation

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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Date: 29-Dec-2011 10:39

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 18077 Group: 5 Sex: Male (continued)

Histo Pathology Observations: (continued)

PARATHYROID GLAND;

One of pair was available for evaluation

PROSTATE GLAND;

Infiltration, Mononuclear Cell; minimal

The following tissues were within normal limits:

ADRENAL GLAND	AORTA	BONE MARROW, FEMUR	BONE, FEMUR	BRAIN	COAGULATING GLAND	EPIDIDYMIS
ESOPHAGUS	EYE	HARDERIAN GLAND	HEART	INTESTINE, CECUM	INTESTINE, COLON	INTESTINE, DUODENUM
INTESTINE, ILEUM	INTESTINE, JEJUNUM	INTESTINE, RECTUM	LUNG	LYMPH NODE, MANDIBULAR		LYMPH NODE, MESENTERIC
NOSE, LEVEL 1	NERVE, OPTIC	NERVE, SCIATIC	PANCREAS	PARATHYROID GLAND	PEYERS PATCH	PHARYNX
PITUITARY GLAND	SALIVARY GLAND	SEMINAL VESICLE	SKELETAL MUSCLE	SKIN, MAMMARY	SPINAL CORD	SPLEEN
TESTIS	THYMUS	THYROID GLAND	TONGUE	TRACHEA	URETER	URINARY BLADDER

The following tissues have not been examined:

BONE, STERNUM; NOT COLLECTED AT NECROPSY
STOMACH; NOT FOUND AT TRIMMING

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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Date: 29-Dec-2011 10:40

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3745	Group: 2	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 100 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 26APR2011 Study Day No. (Week): 91 (13) Mode of Death: CHOLINESTERASE SUBSET
Date of Necropsy: 26APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations:Correlated with:KIDNEY;

Dilation (TGL): right slight pelvic dilation KIDNEY; Hydronephrosis; mild (H)

Histo Pathology Observations:KIDNEY;

Hydronephrosis; mild KIDNEY; Dilation (G)

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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Date: 29-Dec-2011 10:40

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3749	Group: 2	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 100 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 26APR2011 Study Day No. (Week): 91 (13) Mode of Death: CHOLINESTERASE SUBSET
Date of Necropsy: 26APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations:Correlated with:KIDNEY;

Dilation (TGL): right slight pelvic dilation KIDNEY; Hydronephrosis; mild (H)

Histo Pathology Observations:KIDNEY;

Hydronephrosis; mild KIDNEY; Dilation (G)

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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Date: 29-Dec-2011 10:40

TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3825	Group: 3	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 500 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 26APR2011 Study Day No. (Week): 91 (13) Mode of Death: CHOLINESTERASE SUBSET
Date of Necropsy: 26APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations:Correlated with:KIDNEY;

Dilation (TGL): right slight pelvic dilation KIDNEY; Hydronephrosis; mild (H)

Histo Pathology Observations:KIDNEY;

Hydronephrosis; mild KIDNEY; Dilation (G)

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

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TQC00066 - Oral (Diet) Repeated Dose 90-Day Toxicity Study of
Malathion Technical in Rats

Animal No.: 3771	Group: 4	Sex: Male	Species: Rat	Strain: Sprague Dawley
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Test Material: Malathion Technical (CHA 300) Dose: 5000 ppm Route: Oral Diet Study Type: Toxicity
Date of Death : 26APR2011 Study Day No. (Week): 91 (13) Mode of Death: CHOLINESTERASE SUBSET
Date of Necropsy: 26APR2011 ** NECROPSY COMPLETE **

Pathologist: Carol J. Detrisac ** EXAMINATION COMPLETE **

Terminal Body Weight: None

Gross Pathology Observations:Correlated with:

THYMUS;

Dark Red (TGL) THYMUS; Hemorrhage; peracute; mild (H)

Histo Pathology Observations:

THYMUS;

Depletion; cortical; minimal
Hemorrhage; peracute; mild THYMUS; Dark Red (G)

Codes Used: TGL = Trackable Gross Lesion, G = Gross Finding, H = Histo Finding.

APPENDIX 9 - BONE MARROW ANALYSIS REPORT



FINAL REPORT

Study Phase: Bone Marrow

Test Site Phase Reference No. TQC00066

Testing Facility Study No. TQC00066

**Oral (Diet) Repeated Dose 90-Day Toxicity Study of Malathion Technical
in Rats**

"

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2. COMPLIANCE STATEMENT

The portion of this study performed by Charles River Laboratories, Preclinical Services, Nevada (PCS-NV) was conducted in compliance with the following Good Laboratory Practice (GLP) regulations:

- U.S. Environmental Protection Agency (EPA) and the Organisation for Economic Co-operation and Development (OECD).

This study phase was conducted in accordance with the procedures described herein. The report represents an accurate and complete record of the results obtained.

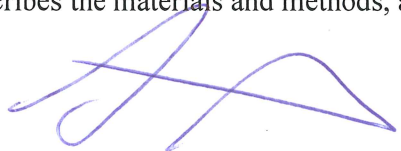
3. QUALITY ASSURANCE STATEMENT

This study has been inspected by the Quality Assurance Unit to assure conformance with the Good Laboratory Practice (GLP) regulations promulgated by the OECD & EPA. Reports were submitted in accordance with standard operating procedures (SOP) as follows:

QA INSPECTION DATES

Dates of Inspection	Phase(s) Inspected	<u>Dates Findings Submitted to:</u>			
		PI	PI Management	Study Director	Study Director Management
17-21 Jun 2011	Draft Bone Marrow Report	21 Jun 2011	21 Jun 2011	01 Jul 2011	01 Jul 2011
15 Dec 2011	Final Bone Marrow Report	15 Dec 2011	15 Dec 2011	04 Jan 2012	04 Jan 2012

The Final Report for this portion of the study has been reviewed to assure that it accurately describes the materials and methods, and the reported results accurately reflect the raw data.



Lisa Peterson, BS
QA Auditor I

04 Jan 2012
Date

4. SUMMARY

Fifty male and 50 female Crl:CD(SD) rats (10/sex/group) were assigned to the main study and were administered Malathion Technical at doses of 0, 100, 500, 5,000, or 10,000 parts per million for Groups I, II, III, IV, and V, respectively. Animals were administered Malathion Technical via a carrier (meal form of Certified Rodent Diet[®] #5002 [PMI[®] Nutrition International]). A constant concentration of the test substance in the diet was offered to the rats, and the mg/kg/day dosages consumed were calculated and presented for periods corresponding to body weight and feed consumption observations. Male and female rats were euthanized on Day 91 and bone marrow smears were evaluated.

Administration of Malathion Technical at doses of 100, 500, 5,000, or 10,000 parts per million was not associated with test article-related effects in the bone marrow.

5. RESPONSIBLE PERSONNEL

Principal Investigator,
Bone Marrow Evaluation:

Angela Wilcox, BVSc, MS, DACVP, DABT
PCS-NV

6. INTRODUCTION

This report presents the bone marrow smear evaluation results in the Crl:CD(SD) rat assigned to the study entitled “Oral (Diet) Repeated Dose 90-Day Toxicity Study of Malathion Technical in Rats,” (Study No. TQC00066).

The study was sponsored by Cheminova A/S, P.O. Box 9, DK-7620 Lemvig, Denmark. John F. Barnett, Jr., BS, Charles River Laboratories, PCS-PA, served as the Study Director.

7. MATERIALS AND METHODS

7.1. Experimental Design

Experimental procedures are summarized in [Text Table 1](#).

Text Table 1
Experimental Design

Dosage Group	Number of Rats Per Sex	Concentration (ppm)	Batch Number
I	10 ^a + 15 ^b	0 (Carrier Control)	B-TQC00066-A
II	10 ^a + 15 ^b	100	B-TQC00066-B
III	10 ^a + 15 ^b	500	B-TQC00066-C
IV	10 ^a + 15 ^b	5000	B-TQC00066-D
V	10 ^a + 15 ^b	10000	B-TQC00066-E

The test substance was considered 95.8% active/pure for the purpose of dosage calculations.

^a The first 10 rats/sex/dosage group were assigned to the main study.

^b The remaining 15 rats/sex/dosage group were assigned to the cholinesterase subset.

A 200-cell bone marrow differential count was performed on all main study animals euthanized on Day 91. Peripheral blood specimens were also collected for hematology on Day 91 prior to necropsy.

7.1.1. Bone Marrow Cytology

Brush preparations from the sternum for bone marrow cytology were stained per standard operating procedure and evaluated from all animals. A 200-cell count was completed on one smear suitable for evaluation from each animal. Smears were scanned at 200X and 500X (oil immersion) magnification to assess overall cellularity, stain quality, number of megakaryocytes, and to locate a suitable area for cell counting. Cell counting and cellular morphologic evaluation

was performed at 1000X (oil immersion) magnification. The following cell types were enumerated:

Myeloid, erythroid, and lymphoid cell types were counted. Other cells types were observed but not identified unless in excessive numbers or displayed abnormal morphology. Megakaryocytes often were not encountered during the 1000X cell count; therefore, the number of megakaryocytes on the smears were evaluated at lower magnification and not reported unless abnormal in morphology or number.

The Myeloid:Erythroid ratio (M:E) was calculated to make the erythroid cell series a value of 1. A total cell count of exactly 200 myeloid and erythroid cells was performed. The interpretation of bone marrow cytological changes was based on the number and maturation stage features of the cells counted and potential changes were considered in the context of hematology findings.¹ Lymphocytes were counted and presented as a percentage of cells per 200 myeloid and erythroid cells counted.

7.2. Statistical Analysis

Statistical analyses performed included calculated average M:E ratios and percentage of lymphocytes.

7.3. Disposition of Study Materials

All study specific raw data, documentation, and Final Report generated from this study phase will be archived at the Testing Facility.

¹ M:E ratios were interpreted in conjunction with hematology observations. For example: Higher M:E ratios might suggest either increased myeloid production (if accompanied by increased neutrophil counts) or decreased erythroid production (if accompanied by decreased red blood cell mass or decreased reticulocyte counts). A lower M:E ratio might be associated with either increased erythroid production (if accompanied by increased reticulocyte counts) or decreased myeloid production (if accompanied by decreased neutrophil counts).

8. RESULTS AND CONCLUSIONS

8.1. Treatment Period

The results of bone marrow cytological evaluations and M:E ratios are presented in [Appendix 1](#). At least 1 bone marrow smear from each animal with a reported M:E ratio and percentage of lymphocytes was of adequate quality and cellularity. Bone marrow smears from 24 female rats were unable to be evaluated due to low cellularity.

There were no test article effects in the bone marrow associated with administration of Malathion Technical at doses of 100, 500, 5,000, or 10,000 parts per million (ppm). M:E ratios and lymphocyte percentages in males and M:E ratio in females were similar to control animals on Day 91. The average lymphocyte percentage in females was minimally higher in dosed animals compared to control (39.2 % in control versus 49.5%, 43.9%, 45.6%, and 50.8% in females dosed at 100, 500, 5,000, and 10,000 ppm, respectively). This finding was considered to be incidental due to the lack of a dose dependent relationship, no correlative findings in histologic sections of bone marrow examined, no correlative changes in peripheral lymphocyte counts, and all dosed individual female values fell within the range of variability in control male and female lymphocyte percentages (20.5% to 77.5%). Although fewer bone marrow smears from female animals were evaluated, there were sufficient numbers for comparison of M:E ratios and lymphocyte percentages to control animal values. Additionally, there were no histopathologic abnormalities observed in the bone marrow of males or females (see Pathology Report).

Bone marrow findings observed at the end of the dosing phase that were considered unrelated to test article administration included minimal erythroid hypercellularity in 1 control male (Animal 3782) and 1 male (Animal 3704) administered 10,000 ppm. There were no correlative changes in any of the hematology parameters and the M:E ratio for the high dose animal was the same as the control animal. Therefore, both M:E ratios were considered to be incidental.

Hematology data are presented in the Main Study Report. There were no hematology findings associated with administration of Malathion Technical at doses of 100, 500, 5,000, or 10,000 parts per million.

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9. REPORT APPROVAL



Date: 04-Jan-2012


Angela Wilcox, BVSc, MS, DACVP, DABT
Clinical Pathologist

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10. SCIENTIFIC REPORT REVIEW

This report has been reviewed for scientific content. The signature below indicates a concurrence with the Principal Investigator's interpretation of these data as presented in this report.



Dennis J. Meyer, DVM, DACVIM, DACVP
Executive Director, Navigator Services

Date: 04 Jan 2012

Appendix 1
Individual Myeloid:Erythroid (M:E) Ratios

Appendix 1: Results of Individual Bone Marrow Evaluations**Study Number: TQC00066**

Animal Number	Sex	M:E ¹	% Lymphocytes	Comments
Bone Marrow Collection: Day 91				
Group I: 0 ppm² carrier control				
3776	M	1.3	42.5%	NA ³
3777	M	1.3	39.0%	NA
3778	M	0.9	56.5%	NA
3779	M	1.4	43.0%	NA
3780	M	1.2	54.5%	NA
3781	M	1.2	77.5%	NA
3782	M	0.7	35.0%	Minimal erythroid hypercellularity
3783	M	1.5	29.5%	NA
3784	M	1.1	37.5%	NA
3785	M	1.1	35.5%	NA
Average	M	1.2	45.1%	
3901	F	1.0	37.5%	NA
3902	F	NA	NA	UTE ⁴
3903	F	0.9	20.5%	NA
3904	F	0.9	46.5%	NA
3905	F	NA	NA	UTE
3906	F	1.1	56.5%	NA
3907	F	NA	NA	UTE
3908	F	1.0	35.0%	NA
3909	F	NA	NA	UTE
3910	F	NA	NA	UTE
Average	F	1.0	39.2%	

¹M:E=myeloid:erythroid ratio. Values represent the myeloid component of the ratio with the erythroid component=1.0 (for example, M:E of 1.7:1.0 is presented as 1.7)

²ppm=parts per million

³NA=not applicable

⁴UTE=Unable to evaluate

Appendix 1: Results of Individual Bone Marrow Evaluations**Study Number: TQC00066**

Animal Number	Sex	M:E¹	% Lymphocytes	Comments
Group II: 100 ppm				
3726	M	1.2	33.0%	NA
3727	M	1.2	29.5%	NA
3728	M	1.1	50.5%	NA
3729	M	1.3	41.5%	NA
3730	M	1.3	38.0%	NA
3731	M	1.1	50.5%	NA
3732	M	1.5	54.0%	NA
3733	M	1.2	25.0%	NA
3734	M	0.8	33.0%	NA
3735	M	1.2	44.0%	NA
Average	M	1.2	39.9%	
3851	F	1.2	42.0%	NA
3852	F	1.0	41.5%	NA
3853	F	1.4	63.0%	NA
3854	F	1.2	35.5%	NA
3855	F	1.5	65.5%	NA
3856	F	NA	NA	UTE
3857	F	NA	NA	UTE
3858	F	NA	NA	UTE
3859	F	NA	NA	UTE
3860	F	NA	NA	UTE
Average	F	1.3	49.5%	

Appendix 1: Results of Individual Bone Marrow Evaluations**Study Number: TQC00066**

Animal Number	Sex	M:E¹	% Lymphocytes	Comments
Group III: 500 ppm				
3801	M	1.1	37.5%	NA
3802	M	1.3	35.0%	NA
3803	M	1.3	40.0%	NA
3804	M	1.2	32.0%	NA
3805	M	1.4	38.0%	NA
12250	M	1.4	53.0%	NA
3807	M	1.1	27.0%	NA
3808	M	1.4	40.5%	NA
3809	M	1.0	39.0%	NA
3810	M	1.1	28.0%	NA
Average	M	1.2	37.0%	
3926	F	NA	NA	UTE
3927	F	NA	NA	UTE
3928	F	1.3	38.0%	NA
3929	F	NA	NA	UTE
3930	F	NA	NA	UTE
3931	F	0.9	27.0%	NA
3932	F	0.9	66.5%	NA
3933	F	1.0	44.0%	NA
3934	F	NA	NA	UTE
3935	F	NA	NA	UTE
Average	F	1.0	43.9%	

Appendix 1: Results of Individual Bone Marrow Evaluations**Study Number: TQC00066**

Animal Number	Sex	M:E¹	% Lymphocytes	Comments
Group IV: 5,000 ppm				
3751	M	1.1	36.0%	NA
3752	M	1.4	32.5%	NA
3753	M	1.0	40.0%	NA
3754	M	1.1	45.0%	NA
3755	M	1.2	51.0%	NA
3756	M	0.9	39.5%	NA
3757	M	1.2	46.5%	NA
3758	M	1.1	47.0%	NA
3759	M	1.3	41.5%	NA
3760	M	1.2	31.5%	NA
Average	M	1.2	41.1%	
3951	F	1.5	29.0%	NA
3952	F	0.9	70.5%	NA
3953	F	NA	NA	UTE
3954	F	1.1	40.0%	NA
3955	F	1.1	39.5%	NA
3956	F	NA	NA	UTE
3957	F	1.0	56.0%	NA
3958	F	1.1	38.5%	NA
3959	F	NA	NA	UTE
3960	F	NA	NA	UTE
Average	F	1.1	45.6%	

Appendix 1: Results of Individual Bone Marrow Evaluations**Study Number: TQC00066**

Animal Number	Sex	M:E¹	% Lymphocytes	Comments
Group V: 10,000 ppm				
3701	M	1.1	35.0%	NA
18077	M	1.0	42.5%	NA
3703	M	1.2	30.0%	NA
3704	M	0.7	19.0%	Minimal erythroid hypercellularity
3705	M	1.1	30.0%	NA
3706	M	1.4	45.5%	NA
3707	M	1.2	41.0%	NA
3708	M	1.0	34.0%	NA
3709	M	1.3	37.0%	NA
3710	M	1.2	53.5%	NA
Average	M	1.1	36.8%	
3876	F	NA	NA	UTE
3877	F	1.1	58.5%	NA
3878	F	1.1	41.0%	NA
3879	F	NA	NA	UTE
3880	F	1.2	59.5%	NA
3881	F	1.0	44.5%	NA
3882	F	NA	NA	UTE
3883	F	0.9	39.0%	NA
3884	F	1.1	62.0%	NA
3885	F	NA	NA	UTE
Average	F	1.1	50.8%	

APPENDIX 10 - BENCHMARK DOSE MODELING REPORT



**Benchmark Dose Modeling for
Cholinesterase Inhibition for
Malathion in TQC66**

Prepared for:

Cheminova A/S
M Jensen
Lemvig, Denmark

Prepared by:

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1800 Diagonal Road, Suite 500
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December 7, 2011

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QMS QA ID no. V10532.000 A0T0 1211 RR07

Statement of Data Confidentiality

This report contains confidential and proprietary information of Cheminova A/S, which must not be disclosed to anyone except the employees of this company or to persons authorized by law or juridical judgment, without the expressed and written approval of Cheminova A/S.

Statement of Good Laboratory Practice Compliance

This report provides a statistical evaluation of certain data from the following study:

“Benchmark dose modeling for cholinesterase inhibition for malathion in TQC66”

As such, compliance with Good Laboratory Practice is not applicable to this report.

Author:

Rick Reiss, Sc.D.
Exponent

Signature: 

Date: 12/7/11

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Executive Summary

Cheminova conducted a 90-day repeated dose dietary toxicity study of malathion technical in rats (Barnett, 2012).

This report presents a benchmark dose (BMD) analysis of the data for red blood cell (RBC) and brain cholinesterase inhibition. BMD analysis provides a statistical estimate of the dose that causes a given level of inhibition. BMD estimates are generally more accurate than No Observed Effect Levels (NOELs) because (1) they are not as sensitive to sample size, (2) not as sensitive to the dose levels tested, and (3) they model the shape of the dose-response curve.

BMD estimates were calculated corresponding to plausible values of interest for risk assessment, including BMDs corresponding to 20% (BMD₂₀) inhibition of RBC cholinesterase and 10% inhibition (BMD₁₀) of brain cholinesterase.

An exponential model recommended by the U.S. Environmental Protection Agency (EPA) was used and provided an adequate fit to the data. The BMD estimates are summarized in the table below.

Compartment	BMD	BMD Estimate (mg/kg-bw/day) [BMDL in parentheses]	
		Males	Females
RBC	BMD ₂₀	48.7 (41.0)	42.0 (34.5)
Brain	BMD ₁₀	174.6 (132.0)	118.4 (103.3)

Introduction

This report provides an analysis of cholinesterase data from a 90-day repeated dose dietary toxicity study of malathion technical in rats (Barnett, 2012).

The basis for the analysis in this report is the estimation of benchmark doses (BMDs). BMD modeling is an alternative to No Observed Effect Levels (NOELs) in dose-response analysis. A NOEL is typically defined based on statistical comparisons of the response at each dose level with the control group. In comparison, a BMD is estimated by defining a response level of interest (e.g., a 20 percent difference from controls [BMD₂₀]) and estimating the dose that results in that level of change based on a regression analysis of the response against dose. The U.S. Environmental Protection Agency (EPA) policy mandates the statistical lower limit of the estimate be used as the point-of-departure for risk assessment (e.g., EPA 2000, EPA 2006). The 95 percent lower confidence limit on the BMD estimate is abbreviated as BMDL.

The BMD approach provides significant advantages in dose-response analysis (e.g., EPA, 2000), particularly in comparing responses across different assays or across time points within the same assay. The advantages of the BMD approach include:

- **Not as sensitive to sample size.** The NOEL is highly dependent on the sample size of the study. With large sample sizes, lower NOELs can be estimated (unless there is a clear biological threshold) because smaller differences in response can be detected. In contrast, there is no difference in the estimated BMD as a function of sample size, but the estimate is improved with larger sample sizes because the error bounds around the BMD usually are reduced (i.e., only the BMDL changes with sample size).
- **Not as sensitive to dose levels tested.** The NOEL is highly dependent on the study dose selection and the final estimate must be one of the dose levels tested, whereas the BMD can be a dose in between the dosage levels tested. Poor dose selection can result in higher or lower NOELs than justified, or sometimes a NOEL cannot be established. The BMD approach requires only

that the doses tested in the study achieve a range of responses to characterize the dose-response curve, and the BMD value can be any level across the dosage spectrum in the experiment.

- **Models the shape of the dose-response curve.** The BMD approach explicitly accounts for the shape of the dose-response curve, while the NOEL approach does not take into account the shape of the dose-response relationship.

Methodology

BMDs were estimated using EPA's methodology for cholinesterase inhibition as outlined in EPA (2006). The general dose-response model of an exponential declining curve has the following form:

$$Che = A \left[P_B + (1 - P_B) * \exp \left(\frac{\log \left(\frac{1 - P_B - BMR}{1 - P_B} \right)}{BMD} * Dose \right) \right] \quad (1)$$

where:

- Che = cholinesterase activity
- A = level of cholinesterase activity in the absence of exposure to the organophosphate
- P_B = fraction of cholinesterase activity remaining at a very high dose of the organophosphate.
- BMR = level of inhibition at which to estimate the benchmark dose (e.g., 0.20 for a 20 percent inhibition).
- BMD = benchmark dose.
- $Dose$ = dose of the chemical.

Due to difficulties simultaneously fitting A , BMD , and P_B , the P_B parameters were estimated by testing various combinations of P_B for males and females and choosing the model with the highest maximum likelihood. A power function accounted for heteroscedasticity (i.e., differences in the variance across groups).

The models were implemented in the R programming language (R Core Development Team 2011).

Available Data

The 90-day toxicity study included measurements of red blood cell (RBC) and brain cholinesterase levels. Fifteen rats were assigned to each of four dose groups (100, 500, 5000, and 10000 ppm in feed) plus a control. The actual doses were tabulated in the study report and are summarized in Table 1.

Table 1. Doses by group for cholinesterase study

Feed Level (ppm)	Male Dose (mg/kg/day)	Female Dose (mg/kg/day)
100	6.2	6.6
500	31.4	33.8
5000	311.8	335.5
10,000	635.3	680.3

RBC Cholinesterase Inhibition

Table 2 summarizes the RBC cholinesterase data used in the BMD analysis. RBC cholinesterase levels were statistically significantly reduced in the 500, 5000, and 10,000 ppm dose groups for males and the 100, 500, 5000, and 10,000 ppm dose groups for females.

Table 2. Summary of RBC cholinesterase data used in analysis

Sex	Dose (ppm) / Response (Mean \pm SD) (Units/mL)				
	0	100	500	5000	10,000
Male	1.756 \pm 0.172 (14)	1.626 \pm 0.219 (13)	1.469 \pm 0.275** (12)	0.476 \pm 0.195** (14)	0.255 \pm 0.104** (9)
Female	1.700 \pm 0.146 (15)	1.527 \pm 0.165* (15)	1.367 \pm 0.293** (15)	0.353 \pm 0.111** (14)	0.244 \pm 0.145** (13)

Note: Number of animals is presented in the parentheses.

*Statistically significant, $p < 0.05$

**Statistically significant, $p < 0.01$

Brain Cholinesterase Inhibition

Table 3 summarizes the brain cholinesterase data used in the BMD analysis. Brain cholinesterase levels were significantly reduced in the 5000 and 10,000 ppm dose groups for males and females.

Table 3. Summary of brain cholinesterase data used in analysis

Sex	Dose (ppm) / Response (Mean \pm SD) (Units/g)				
	0	100	500	5000	10,000
Male	14.573 \pm 0.878 (14)	14.963 \pm 0.791 (14)	14.505 \pm 0.537 (14)	12.049 \pm 0.635** (14)	11.936 \pm 1.019** (15)
Female	14.540 \pm 0.775 (15)	14.893 \pm 0.573 (15)	14.204 \pm 0.826 (15)	11.382 \pm 0.877** (15)	7.341 \pm 1.806** (15)

Note: Number of animals is presented in the parentheses.

*Statistically significant, $p < 0.05$

**Statistically significant, $p < 0.01$

Benchmark Dose Analysis

RBC Cholinesterase Inhibition

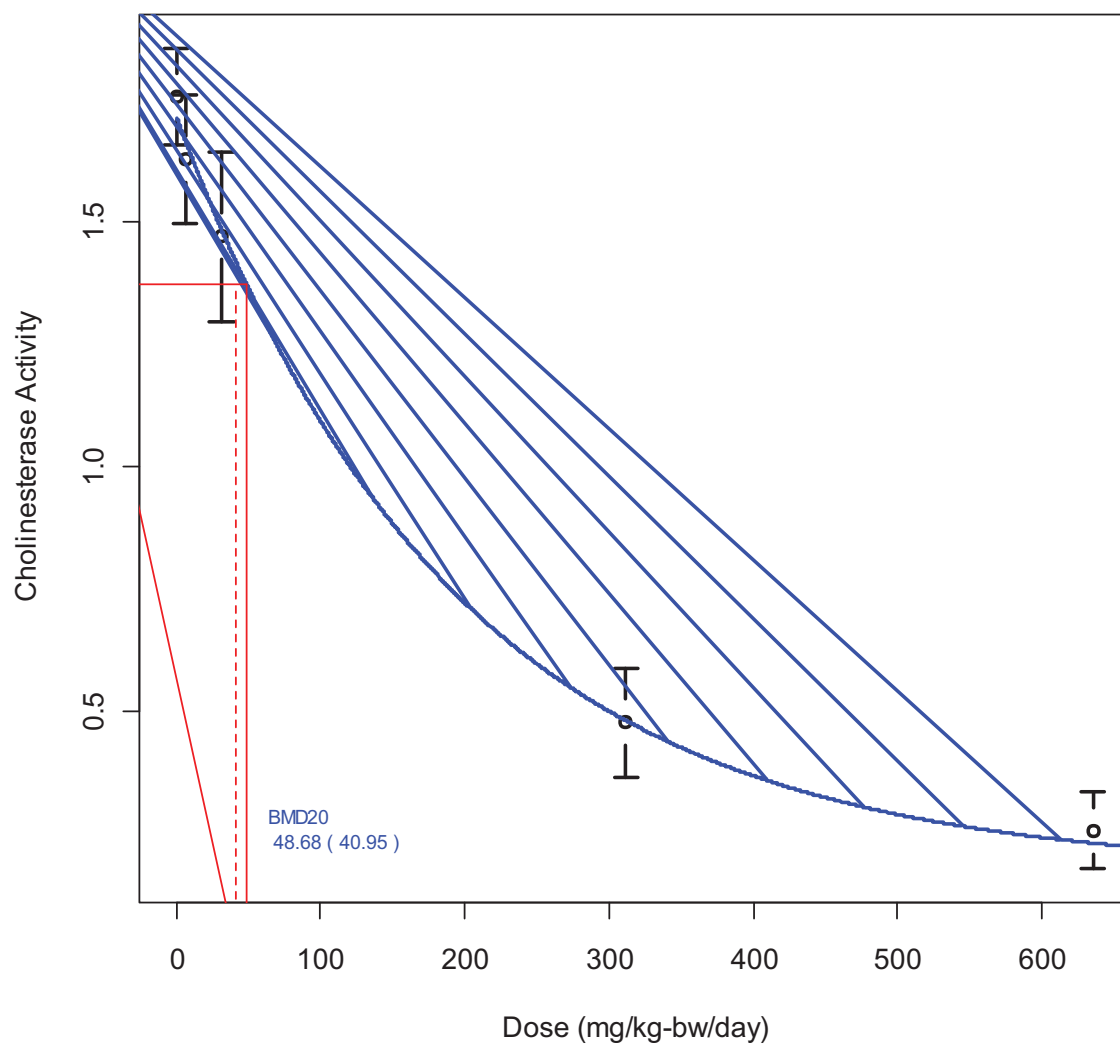
The exponential model described above was used to fit the RBC cholinesterase data and estimate BMDs for 20% inhibition. Table 4 summarizes the BMD results and the values of the other fitted parameters in the dose-response model. The RBC BMD₂₀s were 48.7 mg/kg-bw/day (BMDL₂₀=41.0 mg/kg-bw/day) for males and 42.0 mg/kg-bw/day (BMDL₂₀=34.5 mg/kg-bw/day) for females. Figures 1 and 2 show the dose-response fits to the data. The fits closely match the observations.

Table 4. Benchmark dose results for RBC cholinesterase

Sex	A (unit/mL)	P_B	BMD ₂₀ (BMDL ₂₀) (mg/kg-bw/day)
Male	1.714	0.1	48.7 (41.0)
Female	1.645	0.1	42.0 (34.5)

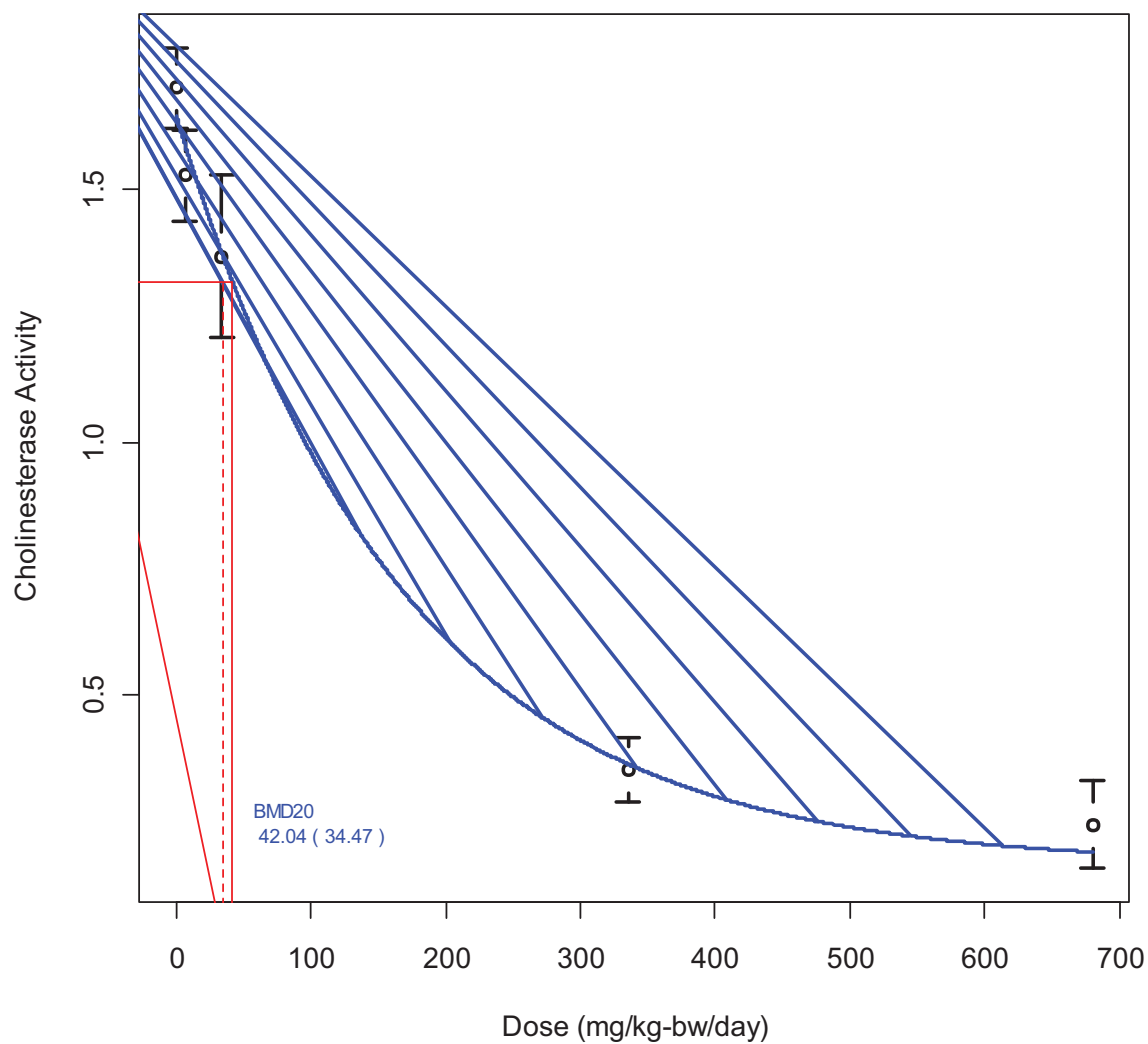
Note: A defines the cholinesterase inhibition without exposure and P_B defines the asymptotic limit for cholinesterase inhibition at a high dose.

Figure 1. Dose-response fit for RBC cholinesterase inhibition for males



Note: The BMD is shown with the solid red line and the BMDL is shown with the dashed red line.

Figure 2. Dose-response fit for RBC cholinesterase inhibition for females



Note: The BMD is shown with the solid red line and the BMDL is shown with the dashed red line.

Brain Cholinesterase Inhibition

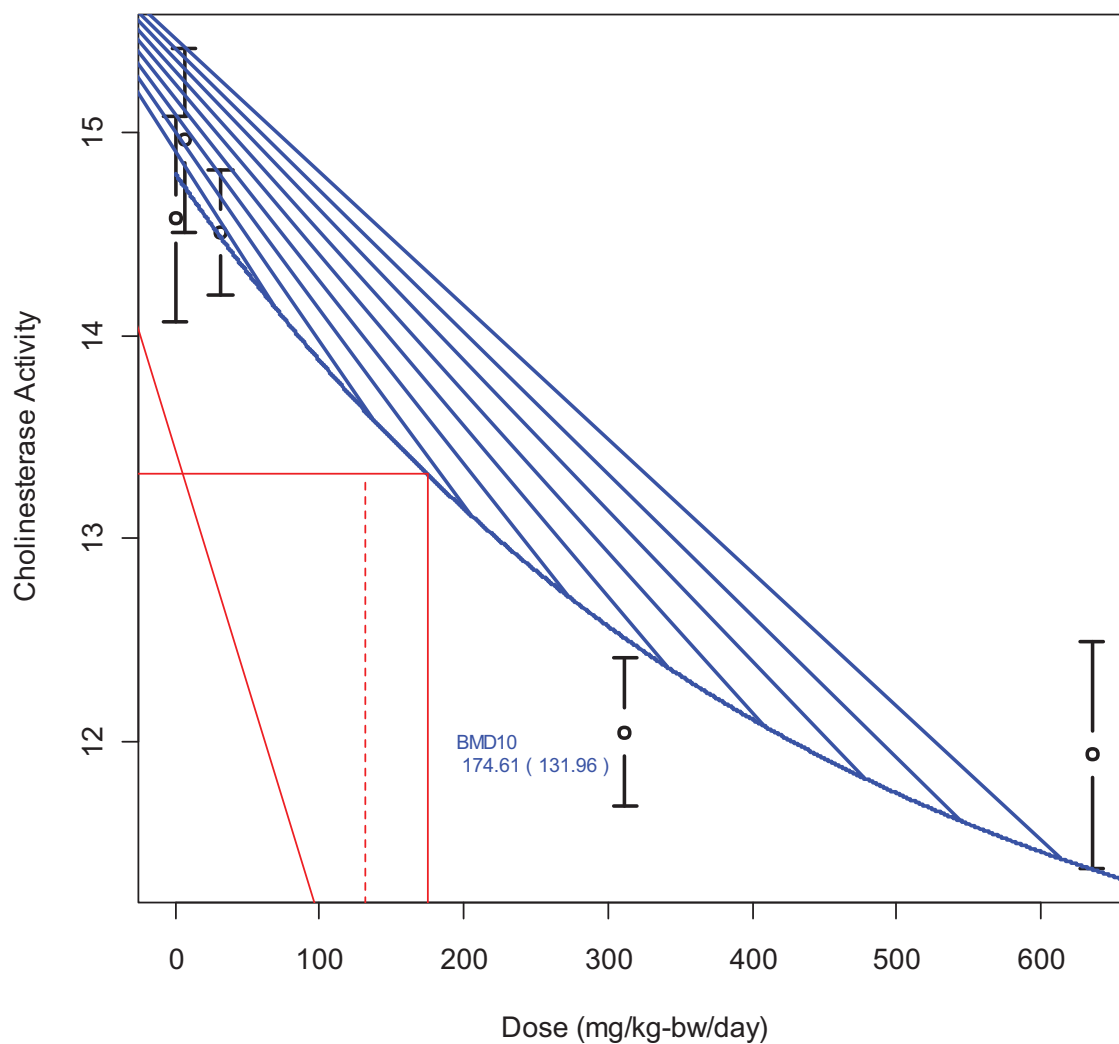
The exponential model described above was used to fit the brain cholinesterase data and estimate BMDs for 10% inhibition. The brain BMD₁₀s were 174.6 mg/kg-bw/day (BMDL₁₀=132.0 mg/kg-bw/day) for males and 118.4 mg/kg-bw/day (BMDL₁₀=103.3 mg/kg/day) for females. Table 5 summarizes the BMD results. Figures 3 and 4 show the dose-response fits to the data. The fits match the observations fairly closely with the exception of the second highest dose level for males, where the fit is slightly outside the 95th percent confidence interval that bounds the group means. However, across all of the data in the study (5 dose groups, 2 compartments, 2 sexes, or a total of 20 groups), having the fit slightly miss two groups is not concerning.

Table 5. Benchmark dose results for brain cholinesterase

Sex	A (units/g)	P_B	BMD ₁₀ (BMDL ₁₀) (mg/kg-bw/day)
Male	14.796	0	174.6 (132.0)
Female	14.746	0.7	118.4 (103.3)

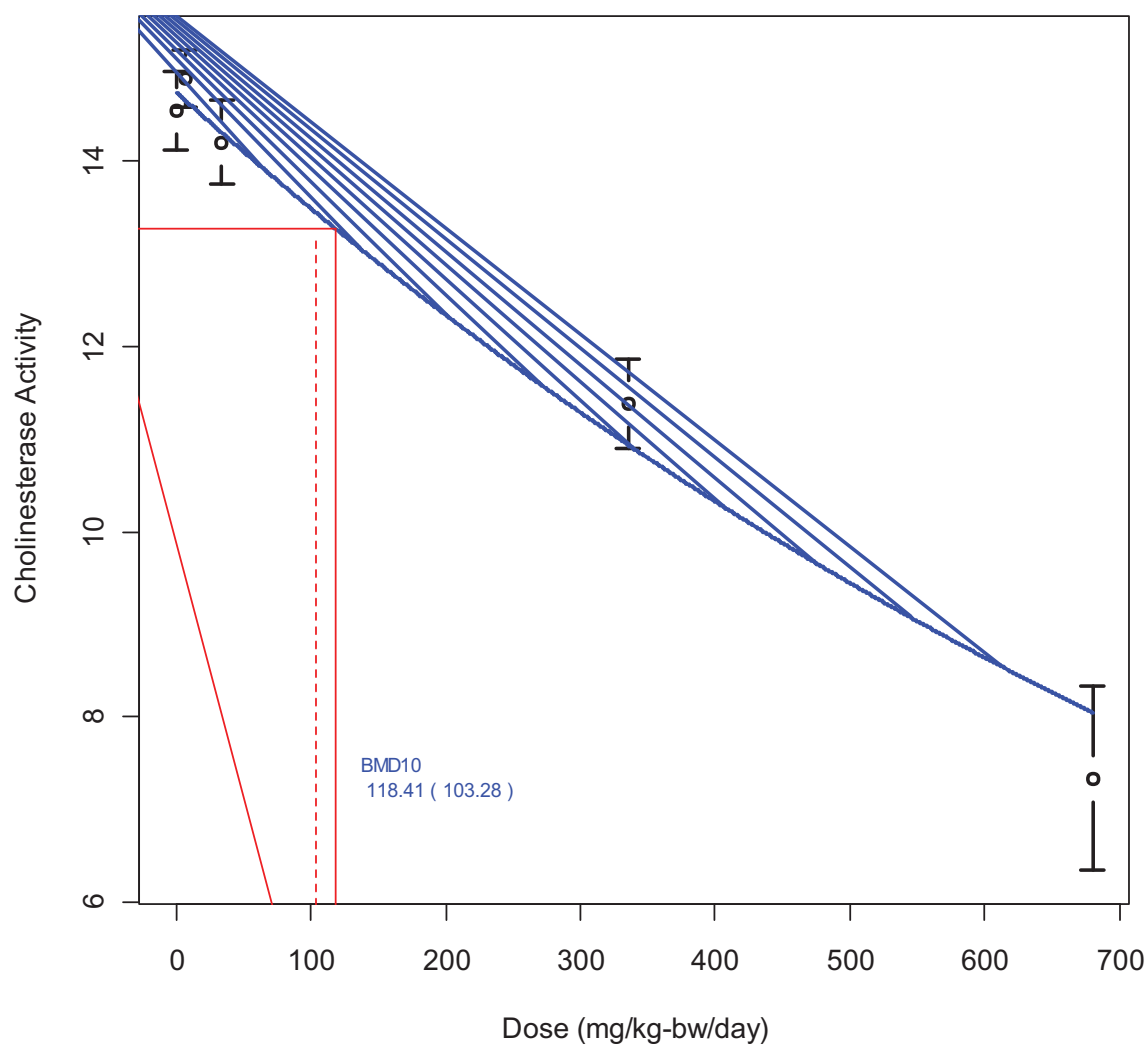
Note: A defines the cholinesterase inhibition without exposure and P_B defines the asymptotic limit for cholinesterase inhibition at a high dose.

Figure 3. Dose-response fit for brain cholinesterase inhibition for males



Note: The BMD is shown with the solid red line and the BMDL is shown with the dashed red line.

Figure 4. Dose-response fit for brain cholinesterase inhibition for females



Note: The BMD is shown with the solid red line and the BMDL is shown with the dashed red line.

Conclusions

This report provides BMD estimates for a 90-day toxicity dietary study of malathion technical in rats.

BMDs were estimated with an exponential model recommended by the U.S. EPA, which provided an adequate fit to the data. The RBC BMD₂₀ estimates were 48.7 mg/kg-bw/day (BMDL₂₀=41.0 mg/kg-bw/day) for males and 42.0 mg/kg-bw/day (BMDL₂₀=34.5 mg/kg-bw/day) for females. The brain BMD₁₀ estimates were 174.6 mg/kg-bw/day (BMDL₁₀=132.0 mg/kg-bw/day) for males and 118.4 mg/kg-bw/day (BMDL₁₀=103.3 mg/kg-bw/day) for females.

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APPENDIX 11 - HISTORICAL CONTROL DATA

SPECIES RAT
STRAIN CRL: CD(SD)
SUPPLIER CHARLES RIVER

HISTORICAL CONTROL DATA
HEMATOLOGY DATA

DATES: 30-MAR-06 30-MAR-11

MALES 13 TO 24 WEEKS

		NO. OF TESTS	NO. OF ANIMALS	MEAN	RANGE OF ACTUAL VALUES		95 % 2. 5%	SPREAD 97. 5%
ERYTHROCYTES	10*6/CMM	996	887	8. 306	2. 870	10. 150	7. 050	9. 370
HEMOGLOBIN	G/DL	996	887	15. 04	4. 70	17. 70	13. 30	16. 90
HEMATOCRIT	%	996	887	42. 83	14. 40	50. 60	38. 40	47. 20
MCH	PG	996	887	18. 14	15. 50	21. 10	16. 40	20. 30
MCHC	G/DL	996	887	35. 11	30. 60	39. 00	32. 80	37. 90
MCV	FL	996	887	51. 69	45. 00	63. 90	46. 90	57. 50
RETICULOCYTES	% RBC	579	529	2. 22	0. 67	24. 86	1. 23	4. 06
PLATELETS	10*3/CMM	996	887	1090. 5	136. 0	2146. 0	752. 0	1403. 0
LEUKOCYTES	10*3/CMM	996	887	9. 81	3. 36	31. 53	4. 66	16. 86
LYMPHOCYTES	10*3/CMM	996	887	7. 57	1. 87	20. 26	3. 45	13. 70
MONOCYTES	10*3/CMM	996	887	0. 33	0. 04	1. 47	0. 10	0. 72
SEGMENTED NEUTROPHILS	10*3/CMM	996	887	1. 67	0. 41	13. 80	0. 65	3. 79
EOSINOPHILS	10*3/CMM	996	887	0. 12	0. 00	0. 57	0. 04	0. 27
BASOPHILS	10*3/CMM	996	887	0. 03	0. 00	0. 16	0. 00	0. 09
LG UNSTAIN CELL	10*3/CMM	995	886	0. 085	0. 000	0. 520	0. 010	0. 260

SPECIES RAT
 STRAIN CRL: CD(SD)
 SUPPLIER CHARLES RIVER

HISTORICAL CONTROL DATA
 HEMATOLOGY DATA

DATES: 30-MAR-06 30-MAR-11

MALES 13 TO 24 WEEKS

		NO. OF TESTS	NO. OF ANIMALS	MEAN	RANGE OF ACTUAL VALUES		95 % 2. 5%	SPREAD 97. 5%
SEGD NEUTROPHILS	% WBC	996	887	17. 2	5. 6	61. 8	7. 6	33. 1
LYMPHOCYTES	% WBC	996	887	77. 0	32. 3	90. 7	59. 6	87. 9
MONOCYTES	% WBC	996	887	3. 4	0. 9	9. 7	1. 5	6. 5
BASOPHILS	% WBC	996	887	0. 3	0. 0	1. 1	0. 1	0. 6
EOSINOPHILS	% WBC	996	887	1. 3	0. 0	6. 5	0. 5	2. 5
LG UNSTAIN CELL	% WBC	995	886	0. 866	0. 000	3. 700	0. 200	2. 600
RETICULOCYTES	10*9/L	486	427	173. 09	36. 70	1042. 00	108. 70	251. 90
MPV	FL	25	25	8. 29	7. 30	9. 50	7. 30	9. 20
RED DIST WIDTH	%	25	25	12. 01	10. 90	13. 80	11. 00	13. 60
HGB DIST WIDTH	G/DL	20	20	2. 62	2. 11	3. 17	2. 17	3. 17
PLT DIST WIDTH	%	15	15	49. 48	43. 10	52. 20	43. 10	52. 20

SPECIES RAT
 STRAIN CRL: CD(SD)
 SUPPLIER CHARLES RIVER

HISTORICAL CONTROL DATA
 HEMATOLOGY DATA

DATES: 30-MAR-06 30-MAR-11

FEMALES 13 TO 24 WEEKS

		NO. OF TESTS	NO. OF ANIMALS	MEAN	RANGE OF ACTUAL VALUES		95 % 2.5%	SPREAD 97.5%
ERYTHROCYTES	10*6/CMM	968	847	7.733	5.660	8.990	6.610	8.580
HEMOGLOBIN	G/DL	968	847	14.62	11.50	17.40	12.80	16.40
HEMATOCRIT	%	968	847	40.84	33.80	48.70	36.30	44.80
MCH	PG	968	847	18.92	16.70	21.80	17.60	20.60
MCHC	G/DL	968	847	35.81	32.60	39.70	33.60	38.50
MCV	FL	968	847	52.90	47.30	64.50	48.90	58.20
RETICULOCYTES	% RBC	596	534	2.11	0.88	11.26	1.13	4.92
PLATELETS	10*3/CMM	968	847	1098.4	97.0	1919.0	749.0	1392.0
LEUKOCYTES	10*3/CMM	968	847	6.93	1.97	28.47	3.04	13.43
LYMPHOCYTES	10*3/CMM	968	847	5.44	1.32	16.29	2.35	10.88
MONOCYTES	10*3/CMM	968	847	0.22	0.03	1.99	0.07	0.50
SEGMENTED NEUTROPHILS	10*3/CMM	968	847	1.10	0.18	10.81	0.38	2.89
EOSINOPHILS	10*3/CMM	968	847	0.10	0.01	0.58	0.03	0.24
BASOPHILS	10*3/CMM	968	847	0.02	0.00	0.15	0.00	0.06
LG UNSTAIN CELL	10*3/CMM	968	847	0.058	0.000	0.350	0.010	0.170

SPECIES RAT
 STRAIN CRL: CD(SD)
 SUPPLIER CHARLES RIVER

HISTORICAL CONTROL DATA
 HEMATOLOGY DATA

DATES: 30-MAR-06 30-MAR-11

FEMALES 13 TO 24 WEEKS

		NO. OF TESTS	NO. OF ANIMALS	MEAN	RANGE OF ACTUAL VALUES		95 % 2.5%	SPREAD 97.5%
SEGD NEUTROPHILS	% WBC	968	847	16.1	4.3	56.0	6.2	33.7
LYMPHOCYTES	% WBC	968	847	78.2	39.6	92.3	58.8	89.3
MONOCYTES	% WBC	968	847	3.1	0.7	9.8	1.4	6.1
BASOPHILS	% WBC	968	847	0.2	0.0	1.1	0.0	0.6
EOSINOPHILS	% WBC	968	847	1.5	0.3	8.7	0.6	3.1
LG UNSTAIN CELL	% WBC	968	847	0.853	0.100	4.200	0.200	2.100
RETICULOCYTES	10*9/L	442	383	150.35	53.30	478.80	89.80	223.10
MPV	FL	25	25	8.16	6.90	9.60	7.20	9.40
RED DIST WIDTH	%	25	25	11.48	10.90	12.40	10.90	12.20
HGB DIST WIDTH	G/DL	20	20	2.46	2.06	2.95	2.14	2.95
PLT DIST WIDTH	%	15	15	50.03	42.90	54.80	42.90	54.80

SPECIES RAT
STRAIN CRL: CD(SD)
SUPPLIER CHARLES RIVER

HISTORICAL CONTROL DATA
CLINICAL CHEMISTRY DATA

DATES: all

MALES 13 TO 24 WEEKS

		NO. OF TESTS	NO. OF ANIMALS	MEAN	RANGE OF ACTUAL VALUES		95 % 2.5%	SPREAD 97.5%
AST	IU/L	533	474	83.5	40.0	559.0	50.0	132.0
ALT	IU/L	533	474	27.3	16.0	189.0	18.0	44.0
ALK PHOS' TASE	IU/L	533	474	97.0	38.0	590.0	49.0	174.0
GGT, SERUM	IU/L	533	474	0.130	0.000	9.910	0.000	1.050
TOTAL BILIRUBIN	MG/DL	533	474	0.124	0.040	0.330	0.080	0.190
CHOLESTEROL	MG/DL	533	474	53.8	23.0	171.0	31.0	90.0
TRI GLYCERIDE	MG/DL	533	474	55.7	16.0	244.0	27.0	115.0
TOTAL PROTEIN	G/DL	533	474	5.696	4.530	8.350	5.060	6.440
ALBUMIN	G/DL	533	474	2.908	1.930	3.690	2.600	3.310
GLOBULIN	G/DL	533	474	2.788	2.090	5.010	2.310	3.380
A/G RATIO	RATIO	533	474	1.052	0.670	1.410	0.850	1.267
GLUCOSE	MG/DL	533	474	161.1	69.0	541.0	96.0	232.0
UREA NITROGEN	MG/DL	533	474	15.9	7.0	290.0	11.0	20.0
CREATININE	MG/DL	533	474	0.310	0.170	8.060	0.210	0.370
CALCIUM	MG/DL	533	474	9.608	8.150	12.800	8.730	10.350

SPECIES RAT
 STRAIN CRL: CD(SD)
 SUPPLIER CHARLES RIVER

HISTORICAL CONTROL DATA
 CLINICAL CHEMISTRY DATA

DATES: all

MALES 13 TO 24 WEEKS

		NO. OF TESTS	NO. OF ANIMALS	MEAN	RANGE OF ACTUAL VALUES		95 % 2.5%	SPREAD 97.5%
SODIUM	MMOL/L	533	474	143.5	127.0	171.0	140.0	147.0
POTASSIUM	MMOL/L	533	474	4.698	3.770	12.280	4.140	5.340
CHLORIDE	MMOL/L	533	474	104.1	83.0	119.0	100.0	108.0
DIRECT BILIRUBIN	MG/DL	29	29	0.032	0.010	0.050	0.020	0.050
INDIR. BILIRUBIN	MG/DL	29	29	0.080	0.050	0.120	0.060	0.120
PHOSPHORUS	MG/DL	533	474	6.908	4.840	41.640	5.520	8.300
CREATINE KINASE	IU/L	15	15	224.3	64.0	565.0	64.0	565.0

SPECIES RAT
 STRAIN CRL: CD(SD)
 SUPPLIER CHARLES RIVER

HISTORICAL CONTROL DATA
 CLINICAL CHEMISTRY DATA

DATES: all

FEMALES 13 TO 24 WEEKS

		NO. OF TESTS	NO. OF ANIMALS	MEAN	RANGE OF ACTUAL VALUES		95 % 2.5%	SPREAD 97.5%
AST	IU/L	504	444	87.2	39.0	616.0	49.0	182.0
ALT	IU/L	504	444	33.0	12.0	257.0	16.0	97.0
ALK PHOS' TASE	IU/L	504	444	52.5	20.0	147.0	24.0	102.0
GGT, SERUM	IU/L	504	444	0.315	0.000	5.150	0.000	1.370
TOTAL BILIRUBIN	MG/DL	504	444	0.143	0.070	0.260	0.090	0.200
CHOLESTEROL	MG/DL	504	444	67.1	27.0	144.0	40.0	104.0
TRI GLYCERIDE	MG/DL	504	444	37.0	17.0	271.0	23.0	63.0
TOTAL PROTEIN	G/DL	504	444	6.217	4.850	8.170	5.340	7.340
ALBUMIN	G/DL	504	444	3.318	2.580	4.330	2.870	3.980
GLOBULIN	G/DL	504	444	2.899	2.060	3.840	2.320	3.490
A/G RATIO	RATIO	504	444	1.153	0.900	1.560	0.970	1.390
GLUCOSE	MG/DL	504	444	153.6	82.0	244.0	101.0	214.0
UREA NITROGEN	MG/DL	504	444	16.5	10.0	28.0	12.0	24.0
CREATININE	MG/DL	504	444	0.343	0.210	0.540	0.250	0.460
CALCIUM	MG/DL	504	444	9.870	8.700	11.560	9.050	10.860

SPECIES RAT
 STRAIN CRL: CD(SD)
 SUPPLIER CHARLES RIVER

HISTORICAL CONTROL DATA
 CLINICAL CHEMISTRY DATA

DATES: all

FEMALES 13 TO 24 WEEKS

		NO. OF TESTS	NO. OF ANIMALS	MEAN	RANGE OF ACTUAL VALUES		95 % 2.5%	SPREAD 97.5%
SODIUM	MMOL/L	504	444	142.7	138.0	149.0	140.0	146.0
POTASSIUM	MMOL/L	504	444	4.241	3.120	7.120	3.640	4.900
CHLORIDE	MMOL/L	504	444	104.9	99.0	109.0	101.0	108.0
DIRECT BILIRUBIN	MG/DL	30	30	0.036	0.020	0.050	0.020	0.050
INDIR. BILIRUBIN	MG/DL	30	30	0.081	0.040	0.120	0.040	0.110
PHOSPHORUS	MG/DL	504	444	5.969	3.290	11.590	4.070	7.780
CREATINE KINASE	IU/L	15	15	228.7	45.0	338.0	45.0	338.0

ORGAN WEIGHTS - MALE RATS
90-DAY HISTORICAL CONTROL DATA (2004 to 2011)
CrI:CD(SD) RATS

SUMMARY
Only includes audited studies

		AVERAGE	MINIMUM	MAXIMUM	NO. STUDIES INCLUDED
INCLUDED IN ANALYSES	N	70	TOTAL RATS		
TERMINAL BODY WEIGHT	MEAN	565.8	503.5	623.3	6
LIVER	MEAN	16.93	14.94	20.37	6
KIDNEY Paired	MEAN	4.06	3.57	4.37	6
BRAIN	MEAN	2.30	2.22	2.37	6
SPLEEN	MEAN	0.88	0.74	0.95	6
ADRENAL Paired	MEAN	0.068	0.062	0.075	6
THYMUS	MEAN	0.35	0.30	0.43	6
THYROID	MEAN	0.060	0.044	0.076	2
HEART	MEAN	1.77	1.62	1.96	6
EPIDIDYMIS Paired	MEAN	1.55	1.52	1.61	6
TESTIS Paired	MEAN	3.64	3.49	3.79	6

ALL WEIGHTS ARE MEASURED IN GRAMS

RATIO OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT - MALE RATS
90-DAY HISTORICAL CONTROL DATA (2004 to 2011)
CrI:CD(SD) RATS

SUMMARY
Only includes audited studies

		AVERAGE	MINIMUM	MAXIMUM	NO. STUDIES INCLUDED
INCLUDED IN ANALYSES	N	70	TOTAL RATS		
TERMINAL BODY WEIGHT	MEAN	565.8	503.5	623.3	6
LIVER	MEAN	2.99	2.49	3.37	6
KIDNEY Paired	MEAN	0.72	0.58	0.81	6
BRAIN	MEAN	0.41	0.36	0.47	6
SPLEEN	MEAN	0.16	0.12	0.17	6
ADRENAL Paired	MEAN	0.013	0.010	0.015	6
THYMUS	MEAN	0.06	0.05	0.09	5
THYROID	MEAN	11.428	8.790	14.066	2
HEART	MEAN	0.31	0.29	0.36	6
EPIDIDYMIS Paired	MEAN	0.28	0.26	0.32	6
TESTIS Paired	MEAN	0.65	0.61	0.73	6

ALL VALUES ARE PERCENTAGES

RATIO OF ORGAN WEIGHT TO BRAIN WEIGHT - MALE RATS
 90-DAY HISTORICAL CONTROL DATA (2004 to 2011)
 Ctrl:CD(SD) RATS

SUMMARY
 Only includes audited studies

		AVERAGE	MINIMUM	MAXIMUM	NO. STUDIES INCLUDED
INCLUDED IN ANALYSES	N	70	TOTAL RATS		
BRAIN WEIGHT	MEAN	2.30	2.22	2.37	6
LIVER	MEAN	735.50	641.05	887.20	6
KIDNEY Paired	MEAN	176.03	160.80	186.00	6
SPLEEN	MEAN	38.00	32.20	41.40	6
ADRENAL Paired	MEAN	2.957	2.700	3.190	6
THYMUS	MEAN	15.31	13.10	18.52	6
THYROID	MEAN	2.565	1.910	3.220	2
HEART	MEAN	77.06	69.60	85.10	6
EPIDIDYMIS Paired	MEAN	67.50	64.39	72.40	6
TESTIS Paired	MEAN	158.28	147.48	170.40	6

ALL VALUES ARE PERCENTAGES

ORGAN WEIGHTS - FEMALE RATS
90-DAY HISTORICAL CONTROL DATA (2004 to 2011)
CrI:CD(SD) RATS

SUMMARY
Only includes audited studies

		AVERAGE	MINIMUM	MAXIMUM	NO. STUDIES INCLUDED
		72	TOTAL RATS		
INCLUDED IN ANALYSES	N	14.0	10	20	6
TERMINAL BODY WEIGHT	MEAN	291.5	265.2	351.5	6
LIVER	MEAN	8.46	7.88	9.03	6
KIDNEY Paired	MEAN	2.17	2.00	2.36	6
BRAIN	MEAN	2.05	1.98	2.16	6
SPLEEN	MEAN	0.59	0.52	0.69	6
ADRENAL Paired	MEAN	0.071	0.064	0.088	6
THYMUS	MEAN	0.31	0.24	0.39	6
THYROID	MEAN	0.041	0.035	0.046	2
HEART	MEAN	1.09	1.00	1.19	6
OVARY Paired	MEAN	0.122	0.090	0.161	6
UTERUS					
Non-Gravid (with cervix)	MEAN	0.71	0.64	0.76	6

ALL WEIGHTS ARE MEASURED IN GRAMS

RATIO OF ORGAN WEIGHT TO TERMINAL BODY WEIGHT - FEMALE RATS
 90-DAY HISTORICAL CONTROL DATA (2004 to 2011)
 CrI:CD(SD) RATS

SUMMARY
 Only includes audited studies

		AVERAGE	MINIMUM	MAXIMUM	NO. STUDIES INCLUDED
		72	TOTAL RATS		
INCLUDED IN ANALYSES	N	14.0	10	20	6
TERMINAL BODY WEIGHT	MEAN	291.5	265.2	351.5	6
LIVER	MEAN	2.93	2.349	3.222	6
KIDNEY Paired	MEAN	0.75	0.574	0.896	6
BRAIN	MEAN	0.72	0.591	0.794	6
SPLEEN	MEAN	0.20	0.186	0.219	6
ADRENAL Paired	MEAN	0.024	0.019	0.032	6
THYMUS	MEAN	0.11	0.086	0.138	6
THYROID	MEAN	15.254	12.374	18.133	2
HEART	MEAN	0.38	0.343	0.406	6
OVARY Paired	MEAN	0.043	0.028	0.060	6
UTERUS					
Non-Gravid (with cervix)	MEAN	0.25	0.215	0.271	6

ALL VALUES ARE PERCENTAGES

RATIO OF ORGAN WEIGHT TO BRAIN WEIGHT - FEMALE RATS
90-DAY HISTORICAL CONTROL DATA (2004 to 2011)
CrI:CD(SD) RATS

SUMMARY
Only includes audited studies

		AVERAGE	MINIMUM	MAXIMUM	NO. STUDIES INCLUDED
		72	TOTAL RATS		
INCLUDED IN ANALYSES	N	14.0	10	20	6
BRAIN WEIGHT	MEAN	2.05	1.98	2.16	6
LIVER	MEAN	413.81	380.98	456.50	6
KIDNEY Paired	MEAN	105.72	98.40	113.28	6
SPLEEN	MEAN	28.62	25.93	33.70	6
ADRENAL Paired	MEAN	3.46	3.20	4.21	6
THYMUS	MEAN	14.86	11.90	18.10	6
THYROID	MEAN	1.683	1.200	2.230	3
HEART	MEAN	53.26	49.26	58.70	6
OVARY Paired	MEAN	5.95	4.50	7.76	6
UTERUS					
Non-Gravid (with cervix)	MEAN	34.57	31.90	36.10	6

ALL VALUES ARE PERCENTAGES