UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

November 23, 1999

MEMORANDUM

SUBJECT: Acephate. Chemical ID No. 103301. Sensitivity Analysis

FROM: Felecia A. Fort, Chemist
Reregistration Branch I
Health Effects Division (7509C)

THRU: Whang Phang, Branch Senior Scientist
Reregistration Branch I
Health Effects Division (7509C)

TO: Monica Alvarez, Chemical Review Manager
Special Review Branch
Special Review and Reregistration Division (7508W)

HED was asked to conduct sensitivity analyses and to determine which commodities comprised the tail (>99.9th %ile of exposure) of the acute dietary (Monte Carlo) assessment conducted for acephate. Information was gathered from the Critical Exposure Contribution (CEC) analysis. For the U.S. Population, 31,612 records were reviewed; for children 1-6 years old, 5904 records were observed.

The components of the tail end of the Monte Carlo distribution are as follows.

U.S. Population

33%	Celery
29%	Succulent Beans
14%	Brussels Sprouts
11%	Chili peppers
6%	Sweet peppers
4%	Head Lettuce
2%	Cranberry juice
<1%	Cauliflower, Celery juice, cranberries, pimientos

Children 1 to 6 years

30%	Celery
38%	Succulent Beans
18%	Brussels Sprouts
5%	Chili peppers
4%	Sweet peppers
2%	Head Lettuce
3%	Cranberry juice
<1%	Cauliflower, celery juice, pimiento

HED was also asked to determine which commodities were considered to be the risk drivers. Based on the CEC information presented above, succulent beans, celery and Brussels sprouts were eliminated from the analysis. The results indicate that succulent beans (e.g., green beans) and celery are the major drivers. The following exposures resulted.

Table 1. Sensitivity Analysis-Risk Driver determination

Population Subgroup	ACEPHATE Acute (99.9%-ile)											
	All commodities		No celery		No succulent beans		No Brussels Sprouts		No beans or celery		No beans, celery or Brussels sprouts	
	Exposure mg/kg/day	% aPAD	Exposure mg/kg/day	% aPAD	Exposure mg/kg/day	% aPAD	Exposure mg/kg/day	% aPAD	Exposure mg/kg/day	% aPAD	Exposure mg/kg/day	% aPAD
US Population	0.001111	22	0.000913	18	0.000814	16	0.000885	18	0.000495	10	0.000346	7
All infants (<1 year)	0.000795	16	0.000791	16	0.000123	2	0.000720	14	0.000114	2	0.000119	3
Children 1-6 years	0.001631	33	0.001418	28	0.001001	20	0.001586	32	0.000690	14	0.000715	14
Children 7 -12 years	0.001549	31	0.001324	26	0.001289	26	0.001042	21	0.000839	17	0.000381	8
Females 13 -50 years	0.000879	18	0.00689	14	0.000677	14	0.000730	15	0.000431	8	0.000330	7

1. Acephate - The acute Population Adjusted Dose (aPAD) is 0.005 mg/kg/day.

All Commodities

U.S. Environmental Protection Agency Ver. 6.73
DEEM ACUTE analysis for ACEPHATE (1989-92 data)
Residue file: acephate1.R96 Adjustment factor #2 NOT used.
Analysis Date: 09-27-1999/05:55:05 Residue file dated: 09-27-1999/03:54:06/8
Acute Reference Dose (aRfD) = 0.005000 mg/kg body-wt/day
MC iterations = 1000 MC list in residue file MC seed = 10
Run Comment: Acephate Acute Run
==========

Summary calculations:

	95th Percentile		99th Percentile		99.9th Percentile	
	Exposure	% aRfD	Exposure	% aRfD	Exposure	% aRfD
U.S. pop - all seasons:	0.000027	0.54	0.000186	3.71	0.001111	22.22
All infants (<1 year):	0.000007	0.15	0.000093	1.85	0.000795	15.90
Nursing infants (<1 year):	0.000001	0.03	0.000006	0.13	0.000051	1.02
Non-nursing infants (<1 yr):	0.000012	0.24	0.000130	2.59	0.000942	18.85
Children (1-6 years):	0.000045	0.89	0.000361	7.22	0.001631	32.63
Children (7-12 years):	0.000031	0.61	0.000242	4.84	0.001549	30.99
Females (13+/preg/not nsg):	0.000029	0.58	0.000146	2.91	0.000653	13.07
Females (13+/nursing):	0.000039	0.79	0.000237	4.74	0.001037	20.75
Females (13-19 yrs/np/nn):	0.000019	0.38	0.000146	2.93	0.000787	15.75
Females (20+ years/np/nn):	0.000027	0.54	0.000177	3.54	0.001060	21.19
Females (13-50 years):	0.000024	0.48	0.000164	3.28	0.000879	17.58
Males (13-19 years):	0.000018	0.35	0.000136	2.72	0.000606	12.12
Males (20+ years):	0.000024	0.49	0.000160	3.19	0.000940	18.79

No Celery

U.S. Environmental Protection Agency Ver. 6.78
DEEM ACUTE analysis for ACEPHATE (1989-92 data)
Residue file: acephatenocelery.R96 Adjustment factor #2 NOT used.
Analysis Date: 11-22-1999/15:59:37 Residue file dated: 11-22-1999/14:47:59/8
Acute Reference Dose (aRfD) = 0.005000 mg/kg body-wt/day
MC iterations = 500 MC list in residue file MC seed = 10
==========

Summary calculations:

	95th Percentile		99th Percentile		99.9th Percentile	
	Exposure	% aRfD	Exposure	% aRfD	Exposure	% aRfD
U.S. pop - all seasons:	0.000016	0.33	0.000145	2.90	0.000913	18.26
All infants (<1 year):	0.000007	0.13	0.000100	2.00	0.000791	15.83
Nursing infants (<1 year):	0.000001	0.02	0.000005	0.10	0.000018	0.36
Non-nursing infants (<1 yr):	0.000011	0.22	0.000138	2.76	0.000883	17.66
Children (1-6 years):	0.000030	0.60	0.000307	6.13	0.001418	28.36
Children (7-12 years):	0.000018	0.36	0.000185	3.70	0.001324	26.49
Females (13+/preg/not nsg):	0.000015	0.31	0.000090	1.79	0.000479	9.58
Females (13+/nursing):	0.000020	0.41	0.000181	3.62	0.000628	12.56
Females (13-19 yrs/np/nn):	0.000011	0.21	0.000110	2.19	0.000650	12.99
Females (20+ years/np/nn):	0.000015	0.30	0.000137	2.75	0.000812	16.23
Females (13-50 years):	0.000013	0.25	0.000124	2.47	0.000689	13.79
Males (13-19 years):	0.000011	0.21	0.000110	2.20	0.000489	9.77
Males (20+ years):	0.000013	0.26	0.000122	2.45	0.000767	15.34

No Succulent Beans

U.S. Environmental Protection Agency Ver. 6.78
DEEM ACUTE analysis for ACEPHATE (1989-92 data)
Residue file: acephatenobeans.R96 Adjustment factor #2 NOT used.
Analysis Date: 11-22-1999/17:10:12 Residue file dated: 11-22-1999/14:56:45/8
Acute Reference Dose (aRfD) = 0.005000 mg/kg body-wt/day
MC iterations = 500 MC list in residue file MC seed = 10
==========

Summary calculations:

	95th Percentile		99th Percentile		99.9th Percentile	
	Exposure	% aRfD	Exposure	% aRfD	Exposure	% aRfD
U.S. pop - all seasons:	0.000015	0.31	0.000097	1.94	0.000814	16.28
All infants (<1 year):	0.000005	0.09	0.000045	0.90	0.000123	2.46
Nursing infants (<1 year):	0.000001	0.03	0.000006	0.13	0.000051	1.01
Non-nursing infants (<1 yr):	0.000006	0.12	0.000053	1.06	0.000131	2.63
Children (1-6 years):	0.000023	0.46	0.000131	2.63	0.001001	20.02
Children (7-12 years):	0.000016	0.33	0.000112	2.23	0.001289	25.77
Females (13+/preg/not nsg):	0.000018	0.36	0.000083	1.66	0.000461	9.22
Females (13+/nursing):	0.000023	0.46	0.000176	3.53	0.000810	16.20
Females (13-19 yrs/np/nn):	0.000011	0.21	0.000067	1.35	0.000521	10.43
Females (20+ years/np/nn):	0.000015	0.30	0.000099	1.98	0.000832	16.65
Females (13-50 years):	0.000014	0.27	0.000095	1.90	0.000677	13.53
Males (13-19 years):	0.000010	0.21	0.000071	1.41	0.000384	7.68
Males (20+ years):	0.000013	0.26	0.000093	1.87	0.000740	14.79

No Brussels Sprouts

U.S. Environmental Protection Agency Ver. 6.78
DEEM ACUTE analysis for ACEPHATE (1989-92 data)
Residue file: acephatenoBrussels.R96 Adjustment factor #2 NOT used.
Analysis Date: 11-23-1999/10:24:12 Residue file dated: 11-23-1999/09:22:03/8
Acute Reference Dose (aRfD) = 0.005000 mg/kg body-wt/day
MC iterations = 500 MC list in residue file MC seed = 10
==========

Summary calculations:

	95th Percentile		99th Percentile		99.9th Percentile	
	Exposure	% aRfD	Exposure	% aRfD	Exposure	% aRfD
U.S. pop - all seasons:	0.000027	0.53	0.000177	3.53	0.000885	17.70
All infants (<1 year):	0.000007	0.14	0.000095	1.89	0.000720	14.39
Nursing infants (<1 year):	0.000001	0.03	0.000006	0.13	0.000063	1.26
Non-nursing infants (<1 yr):	0.000012	0.24	0.000126	2.51	0.000841	16.81
Children (1-6 years):	0.000044	0.89	0.000354	7.09	0.001586	31.73
Children (7-12 years):	0.000030	0.59	0.000220	4.39	0.001042	20.84
Females (13+/preg/not nsg):	0.000028	0.56	0.000140	2.80	0.000644	12.88
Females (13+/nursing):	0.000038	0.76	0.000234	4.67	0.000922	18.44
Females (13-19 yrs/np/nn):	0.000018	0.37	0.000142	2.84	0.000681	13.63
Females (20+ years/np/nn):	0.000026	0.53	0.000167	3.33	0.000768	15.36
Females (13-50 years):	0.000023	0.47	0.000156	3.13	0.000730	14.61
Males (13-19 years):	0.000018	0.35	0.000132	2.65	0.000617	12.33
Males (20+ years):	0.000024	0.48	0.000151	3.03	0.000726	14.52

No Succulent Beans or Celery

U.S. Environmental Protection Agency Ver. 6.78
DEEM ACUTE analysis for ACEPHATE (1989-92 data)
Residue file: acephatenobeansorcelery.R96 Adjustment factor #2 NOT used.
Analysis Date: 11-22-1999/22:10:24 Residue file dated: 11-22-1999/17:12:33/8
Acute Reference Dose (aRfD) = 0.005000 mg/kg body-wt/day
MC iterations = 1000 MC list in residue file MC seed = 10
==========

Summary calculations:

	95th Percentile		99th Percentile		99.9th Percentile	
	Exposure	% aRfD	Exposure	% aRfD	Exposure	% aRfD
U.S. pop - all seasons:	0.000008	0.17	0.000051	1.02	0.000495	9.90
All infants (<1 year):	0.000004	0.09	0.000043	0.87	0.000114	2.28
Nursing infants (<1 year):	0.000001	0.02	0.000005	0.10	0.000015	0.31
Non-nursing infants (<1 yr):	0.000005	0.11	0.000051	1.02	0.000125	2.51
Children (1-6 years):	0.000017	0.34	0.000060	1.20	0.000690	13.79
Children (7-12 years):	0.000011	0.22	0.000051	1.02	0.000839	16.78
Females (13+/preg/not nsg):	0.000008	0.17	0.000040	0.79	0.000162	3.23
Females (13+/nursing):	0.000011	0.22	0.000123	2.46	0.000310	6.21
Females (13-19 yrs/np/nn):	0.000006	0.13	0.000029	0.59	0.000292	5.85
Females (20+ years/np/nn):	0.000007	0.14	0.000052	1.03	0.000501	10.02
Females (13-50 years):	0.000007	0.14	0.000049	0.99	0.000431	8.63
Males (13-19 years):	0.000007	0.14	0.000042	0.83	0.000195	3.90
Males (20+ years):	0.000006	0.13	0.000052	1.05	0.000460	9.20

No Succulent Beans, Celery or Brussels Sprouts

U.S. Environmental Protection Agency Ver. 6.78
DEEM ACUTE analysis for ACEPHATE (1989-92 data)
Residue file: acephatenobeansceleryorbrussels.R96 Adjustment factor #2 NOT used.
Analysis Date: 11-23-1999/11:40:33 Residue file dated: 11-23-1999/09:23:01/8
Acute Reference Dose (aRfD) = 0.005000 mg/kg body-wt/day
MC iterations = 500 MC list in residue file MC seed = 10
==========

Summary calculations:

	95th Percentile		99th Percentile		99.9th Percentile	
	Exposure	% aRfD	Exposure	% aRfD	Exposure	% aRfD
U.S. pop - all seasons:	0.000008	0.17	0.000048	0.95	0.000346	6.91
All infants (<1 year):	0.000004	0.09	0.000042	0.84	0.000119	2.39
Nursing infants (<1 year):	0.000001	0.02	0.000005	0.09	0.000015	0.31
Non-nursing infants (<1 yr):	0.000005	0.11	0.000050	0.99	0.000116	2.33
Children (1-6 years):	0.000017	0.34	0.000059	1.18	0.000715	14.31
Children (7-12 years):	0.000011	0.22	0.000045	0.91	0.000381	7.61
Females (13+/preg/not nsg):	0.000008	0.17	0.000040	0.80	0.000174	3.47
Females (13+/nursing):	0.000011	0.23	0.000134	2.69	0.000270	5.39
Females (13-19 yrs/np/nn):	0.000006	0.13	0.000027	0.55	0.000174	3.49
Females (20+ years/np/nn):	0.000007	0.14	0.000048	0.95	0.000336	6.71
Females (13-50 years):	0.000007	0.14	0.000047	0.93	0.000330	6.59
Males (13-19 years):	0.000007	0.14	0.000041	0.82	0.000203	4.06
Males (20+ years):	0.000006	0.12	0.000050	1.00	0.000309	6.19

cc: Reviewer(F. Fort), Reg. Std. File, RF, SF, Circ.
7509C:RRB1:CM#2:Rm722H:305-7478:FAFort/FF:11/23/99