

Fact Sheet: Human Health Benchmarks for Pesticides - 2017 Update

Summary

EPA has updated its Human Health Benchmarks for Pesticides (HHBPs) in drinking water to reflect the latest scientific information. HHBPs are levels of certain food use pesticides in water at or below which adverse health effects are not anticipated from one-day or lifetime exposures.

A total of 394 HHBPs are now available for pesticides that are currently registered for use on food crops or could result in exposure through food or drinking water. The benchmarks are for pesticides for which the agency has not issued a drinking water health advisory or set an enforceable federal drinking water standard.

EPA first developed the human health benchmarks for pesticides in 2012 to enable states, tribes, water systems, public and other stakeholders to better determine whether the detection of a pesticide in drinking water or source waters for drinking water may indicate a potential health risk. The human health benchmarks for pesticides were developed with the same methods used by the Agency to calculate health advisories for drinking water and are based on data that were peer-reviewed in EPA's pesticide registration process. In 2013, benchmarks for 11 new pesticides were added and benchmarks for 40 pesticides were revised with added cancer information.

All benchmarks were calculated with updated exposure (body weight and drinking water intake) assumptions. Three pesticides previously listed in the table were removed due to updated exposure pattern information demonstrating that these pesticides are no

longer used on food (d-Allethrin, S-Bioallethrin, and Bioallethrin). It should be noted that the data supporting these benchmarks have been previously published in EPA pesticide risk assessments available on the web at <http://www.epa.gov/pesticides>.

Background

In March 2010, EPA announced a drinking water strategy that outlined four principles to expand public health protection. One of these principles is to use the authority of multiple statutes to more effectively protect drinking water by sharing data collected under different statutes. EPA derived the HHBPs by applying the health effects data from pesticide registrations under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and tolerances under the Federal Food, Drug, and Cosmetic Act as amended by the Food Quality Protection Act (FQPA) to the typical methods used for developing drinking water health advisories under the Safe Drinking Water Act.

EPA is providing the HHBPs for informational purposes for use by states, water systems and the public to help understand monitoring data for pesticides that have no drinking water standards or health advisories. Drinking water systems can also use them as reference values to respond to customer inquiries if pesticides are detected through monitoring.

Development of Human Health Benchmarks for Pesticides in Drinking Water

The 2017 HHBPs were derived for non-cancer and cancer health endpoints.

For non-cancer effects, the HHBPs were established for acute and chronic effects. EPA

used the acute and chronic reference doses (RfDs) established for the most sensitive life stage/population. EPA updated and applied body weight and drinking water intake assumptions used to calculate the benchmarks based on National Health and Nutrition Examination Survey (NHANES) and Continuing Survey of Food Intakes by Individuals (CSFII) data.

For the acute HHBPs, the entire exposure is assumed to occur from drinking water.

For the chronic HHBPs, EPA applied a default relative drinking water source contribution of 20 percent. This assumes that 20 percent of exposure to a given pesticide is from water and additional exposure is derived from other source such as food, air or dermal contact.

For pesticide registrations under FIFRA, EPA derives acute or chronic population adjusted doses (PADs) using an FQPA Safety Factor mandated by the FQPA taking into consideration potential pre and/or post natal toxicity and completeness of the data with respect to exposure and toxicity to infants and children. In the majority of instances, the PAD and the RfD are the same. It is only in those few instances when the FQPA Safety Factor is attributed to residual uncertainty with regard to exposure or pre/post natal toxicity that the RfD and PAD differ. More recently, FQPA Safety Factors can account for uncertainties in the overall completeness of the toxicity database, extrapolation from subchronic to a chronic study duration, and lowest observed adverse effect level (LOAEL) to no observed adverse effect level (NOAEL) extrapolation. For this reason, HHBP values were calculated using the PADs.

For cancer effects, benchmarks were calculated using cancer slope factors, standard drinking water exposure assumptions, and a risk range of one in ten-thousand to one in one-million excess cancer risk. A cancer slope factor is the toxicity value for evaluating the probability of an individual developing cancer

from exposure to a certain level of a contaminant over a lifetime.

Most pesticides that have cancer effects do not have cancer slope factors (e.g., threshold type carcinogens or those chemicals for which a mode of action has been established and accepted by the Agency). In cases where a cancer slope factor is not calculated, the chronic (non-cancer) HHBPs are considered protective of cancer health effects.

How to View the HHBPs and Supporting Information

To view the table of HHBPs and supporting information, online go to:
<https://ofmpub.epa.gov/apex/pesticides/f?p=109:3:.....>

Current EPA health advisories and enforceable drinking water standards for other pesticides can be viewed at:
<https://www.epa.gov/dwstandardsregulations/drinking-water-contaminant-human-health-effects-information>

For More Information

For information regarding derivation of HHBPs, contact Jamie Strong at strong.jamie@epa.gov.

For information regarding the documentation for deriving the reference doses or cancer risk estimation, contact Brenda May at may.brenda@epa.gov
