HEALTH RISKS OF ATRAZINE

Atrazine is one of the most widely used herbicides in Canada, and is applied to kill both broadleaf and grassy weeds. The greatest use of atrazine is in the production of corn.

In 1991, Italy and Germany banned the use of atrazine. The European Union (EU) followed suit and banned the use of atrazine in 2003 on the basis that it was virtually impossible to keep water contamination below its regulatory limit of 0.1 ppb (μg/L) due to its widespread use and health concerns. In 2011, the US Environmental Protection Agency announced it was seeking public comments on a potential ban on atrazine.

Health Canada's Pest Management Regulatory Agency (PMRA) initiated a special review of atrazine in 2013 and issued a report in 2015 for public comment. On March 31, 2017, the PMRA announced it was initiating a second special review of atrazine as it had become aware of additional information relating to the toxicology of atrazine and its impacts including potential human health (drinking water) and environmental risk. After completion of this evaluation, a report will be issued for public consultation.

Health Canada's "Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Atrazine" first published in September 1993 was reissued in January 11, 2011. The guideline is 5 μg per litre, fifty times higher than the EU standard. The Canadian guideline was based on scientific data dated from 1964 to 1993. Significant scientific advances have occurred in the fourteen years that has elapsed and the guideline has not undergone re-review and updated.

Atrazine has the ability to disrupt the endocrine system, and has been linked to abnormal sexual maturation and weakened immune functions. It has also been linked to a variety of adverse effects including breast and prostate cancer, reproductive defects including reduced sperm quality. Epidemiological studies suggest that it is carcinogenic to humans.

Importantly, atrazine has non-monotonic effects i.e. it does not exhibit a traditional dose-response that produces increasing effects with increasing doses of exposure. Rather, the effects are more severe at lower doses than at higher doses. The Health Canada guideline was developed without considering the non-monotonic effects of atrazine.

An aspect of atrazine exposure that has received less attention than through drinking water, relates to atmospheric transport of atrazine through volatilization or attached to fine soil particles or dust that are dispersed by wind and air currents. These could be re-deposited on land surfaces, streams and lakes by dry deposition, rainfall or snow. They could be transported for significant distances, and were detected >180 miles from the nearest application site. Potential human exposure occurs through inhalation.

Referring to the atrazine guideline of 5 μg per litre for drinking water quality, the Health Canada guideline states, "It is therefore considered to provide adequate protection for the bottle-fed infant." This conclusion was based on the results of a rat reproduction study that used body weight as an endpoint.

In view of studies that showed abnormal sexual development and non-monotonic effects of atrazine, the approach used cannot be considered precautionary.
Should pregnant women and babies be drinking atrazine-contaminated water? The answer is, "No."

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