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Weed Killers By The Glass

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Beginning on May 15, 1995, a network of environmental organizations began testing tap water for weed killers in cities across the U.S. Corn Belt, in Louisiana, and in Maryland.

Samples were collected every three days from people's homes or offices. Samples collected were sent to the Iowa State Hygienic Lab and analyzed for the presence of atrazine and cyanazine, two of the most heavily used pesticides in all of the United States.

On or about the first day of June and July, larger samples were taken from the same locations and more extensively tested for 11 weed killers and their by-products.

The purpose of this study is to inform the debate and fill current gaps in knowledge about the extent and magnitude of tap water contamination with weed killers, including the severity and duration of peak levels of exposure that routinely exceed federal health standards during the three- to four-month peak runoff period.

The results of these tests reveal widespread contamination of tap water with many different pesticides at levels that present serious health risks.

Major Agricultural Weed Killers are Routinely Found in Tap Water at Levels that Exceed Federal Health Standards.

EPA's Lifetime Health Advisory (LHA) level for the herbicide cyanazine was exceeded at least once in 18 out of 29 cities (62 percent) with a total population of 4.48 million people, 60 percent of the population covered in the study. The herbicide atrazine exceeded the Maximum Contaminant Level (MCL) at least once in 13 communities with a total population of 2.98 million people, representing 43% of the cities, and 40% of the population in the study. Cyanazine levels exceeded federal health guidelines in 35 percent of all samples. Atrazine concentrations were above the federal health standards in 17 percent of all samples (Table 1). [0]

In some cities, herbicides in tap water exceed federal health standards for weeks or months at a time. In Springfield, IL, cyanazine exceeded the LHA in all tap water samples collected between May 27 and June 29. In eight other cities more than half of the samples collected exceeded the atrazine MCL or the cyanazine LHA: Danville and Decatur, IL; Indianapolis, IN; Columbus and Bowling Green, Ohio; Jefferson City, MO; New Orleans, LA; and Kansas City, KS.

Some samples and locations were severely contaminated. Six samples from Danville, IL contained cyanazine at levels *more than 10 times* the LHA, and one sample contained cyanazine at *34 times* the LHA. All nine samples with the highest cyanazine concentrations came from Danville, followed by water from Kansas City, KS; Decatur, IL; Fort Wayne, IN; and Omaha, NE.

The highest atrazine concentration -- 18 ppb, more than 6 times the MCL -- was also found in Danville, IL, as were the next five samples with the highest atrazine concentrations. The communities with the next four highest atrazine detections, all above the MCL, were Fort Wayne, IN; Bowling Green and Columbus, OH; and Kansas City, KS.

Weed Killers Were Found in the Tap Water of 28 out of 29 cities.

Atrazine was found in tap water in 28 out of 29 cities tested (97 percent), cyanazine was found in 25 (86 percent), metolachlor in 19 cities (66 percent), acetochlor in 15 (52 percent), alachlor in 10 cities (34 percent), simazine in four (14 percent), and metribuzin in two cities (7 percent). One of two breakdown products (known as metabolites) of atrazine, desethylatrazine and

desisopropylatrazine, was found in 12 communities. The only community where weed killers were not found in the drinking water was Memphis, TN, which obtains its tap water from deep groundwater wells.

Most of these herbicides have been used in agriculture for decades. However, our study also found trace levels of the herbicide acetochlor, a probable human carcinogen, approved for use in 1993.

Average Levels of Weed Killers in Tap Water Exceeded Federal Standards in 13 Cities.

Average cyanazine levels in tap water over the six-week testing period exceeded the LHA in 13 cities with a population of 2.8 million people. Average atrazine levels in drinking water during the same period exceeded the federal MCL in six of these same 13 cities, including Indianapolis IN; Columbus OH; and Fort Wayne IN.

People in Many Midwestern Cities Are Routinely Exposed to Many Different Pesticides in a Single Glass of Water.

Tap water from two-thirds of the cities tested contained between four and nine pesticides or pesticide by-products. Current EPA drinking water standards are set one chemical at a time and assume that this simultaneous exposure does not occur.

Two or more pesticides or pesticide metabolites were found simultaneously in the drinking water of 27 out of 29 cities, three or more pesticides were found in 23 cities, four or more pesticides in 21 cities, five or more pesticides in 18 cities, six or more pesticides in 14 cities, and seven or more pesticides or metabolites in the treated tap water of five cities: Ft. Wayne, IN; Muncie, IN; Danville, IL; Columbus, OH; and Bowling Green, OH. In Fort Wayne, IN, nine different pesticides and metabolites -- atrazine, cyanazine, metolachlor, alachlor, metribuzin, acetochlor, desethyl-atrazine, desisopropylatrazine, and simazine -- were found in a single sample of tap water collected in June, 1995. Three of these pesticides were found at levels above EPA standards. The nine pesticides included two probable human carcinogens, five possible human carcinogens, one pesticide responsible for birth defects, and four pesticides that disrupt the hormone or endocrine system.

Infants and Children are Exposed to Unsafe Levels and Mixtures of Pesticides in Infant Formula, Juices, and Drinks Reconstituted with Tap Water.

Drinking water standards do not account for the vulnerability of infants to toxic chemicals such as the weed killers found in our tests. Standards also fail to account for the high volume of water young children drink relative to adults.

We estimate that 45,000 infants in 29 cities drank infant formula reconstituted with tap water contaminated with weed killers during the six-week study period. More than 10,000 infants drank infant formula made with tap water with an average atrazine contamination level above the EPA standard for the six-week period. These same 10,000, plus an additional 8,400 infants, drank infant formula made with tap water contaminated with cyanazine at levels above the federal LHA.

An estimated 28,000 infants drank infant formula reconstituted with tap water that was contaminated with at least four and as many as nine pesticides and toxic pesticide by-products during the six week testing period.

Conclusions

Federal Drinking Water Monitoring Requirements are Fundamentally Flawed.

Federal drinking water monitoring requirements provide regulators and public health officials with a fundamentally distorted picture of contamination levels in tap water. Extended periods of exposure to contaminants at levels above federal health standards are not identified by federal monitoring requirements, nor are peak exposures that may exceed these standards by 10-fold to 30-fold or more.

Within the peak contamination period, extended and repeated exposure to weed killers at levels above federal health standards is common in the cities where we tested. Federal monitoring requirements, in contrast, treat all seasons the same and mandate only

one sample during each quarter of the year, including the three-month peak contamination period. Even this lone sample can be taken very early in the spring-summer quarter, before herbicides are applied, or very late, after pesticides have largely flushed downstream. A sample taken at either end of this period will not reflect accurately the degree of the contamination.

Moreover, there is *no monitoring requirement* for so-called "unregulated contaminants" such as cyanazine, even though in our testing program cyanazine was found at levels exceeding federal health advisories more often than any other herbicide.

These failings are of particular concern because federal drinking water standards:

- Do not protect the public from extended periods of exposure above the MCL or LHA;
- Do not consider the risks of exposure to multiple herbicides simultaneously;
- Do not explicitly take into account special risks to children;
- Are based on a flawed methodology that does not adequately protect the public from cancer risks.

Actions and statements by many water utility authorities underscore the need to dramatically improve monitoring. The Kansas City, MO water system will not allow atrazine contamination to exceed EPA lifetime health standards for even one day; to achieve this goal they monitor drinking water *daily* during peak contamination periods (Flannery 1994). The American Water Works Association, which represents the majority of water utilities, noted in their comments to EPA on the atrazine special review that "AWWA is concerned with exceedances of **any** MCL at **any** time..." (AWWA 1995; emphasis in original).

Conventional Water Treatment Does Not Remove Weed Killers.

Following the release of an October, 1994 report by the Environmental Working Group (*Tap Water Blues*), many water utilities claimed that the standard water treatment techniques they were using were able to adequately remove herbicides from contaminated source water. This is not the case.

All of the water tested in this study was treated tap water. In most cases, utilities are using only conventional water treatment -- chlorination and sand filtration -- which does nothing to reduce weed killer levels in water delivered to the community.

The only technology that can adequately remove pesticides once they have contaminated water supplies is the more expensive Granular Activated Carbon. Such water treatment costs are passed on to water customers -- the polluters are not billed. Preventing contamination of drinking water with herbicides in the first place, by phasing out the most toxic compounds and reducing use of all pesticides, is the most efficient and effective means of ensuring the safety of our water supplies.

Recommendations

- Parents in the most contaminated communities should seriously consider alternatives to tap water for infant formula, reconstituted juices or drinks for their infants and children from May 1 through August 30.

  The most contaminated cities identified in this study include:

  Danville, Decatur, Granite City and Springfield, Illinois

  Columbus and Bowling Green, Ohio

  Indianapolis and Fort Wayne, Indiana

  Kansas City, Kansas

  Jefferson City, Missouri

  Omaha, Nebraska

New Orleans, Louisiana

All of these cities had average contamination levels that exceeded at least one federal health standard for the study period, with the exception of New Orleans, LA, which did not exceed any individual health standard for the period but had a combined triazine average contamination level above the atrazine MCL of 3 parts per billion.

- The EPA should require daily monitoring for triazine herbicides with inexpensive immunoassay tests for all surface-water-supplied drinking water systems in the corn belt. The monitoring cost is about $1,500 per city; less than 10 cents per person in a city of 20,000.
- The EPA should phase out the use of the triazine herbicides by September 1996.
- Congress must strengthen federal pesticide and drinking water laws so that they explicitly protect infants and children from acute and chronic effects of these contaminants.
- Absent Congressional action, the EPA should move to set pesticide and drinking water standards to protect infants and children.
- When setting drinking water standards to protect infants and children the EPA must strictly follow the recommendations of the National Academy of Sciences Report, *Pesticides in the Diets of Infants and Children.* At a minimum the EPA must specifically account for contamination of tap water with many different pesticides and metabolites. The agency (1) must explicitly account for additive or synergistic risks that may result from pesticides that act via a similar toxic mechanism or cause a similar toxic effect, (2) it must specifically account for any increased sensitivity or risk associated with infant or childhood exposure to these mixtures of compounds, and (3) it must consider all routes of exposure to the pesticides that a infant or child might encounter.

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