‘Children killer’ glyphosate found in Cheerios? Experts dismantle Environmental Working Group’s glyphosate study

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Cameron English | Genetic Literacy Project | August 17, 2018

Image Credit: David Wolfe

“If you or your children are eating Cheerios right now, there’s a good chance that they’re accompanied by a potentially harmful weed killer called Roundup,” Fortune told its readers on August 16. Newsweek headlined its article, “Dangerous Weed Killer Ingredient Found in Cheerios, Quaker Oats and Other Breakfast Cereals.”

These were two of literally hundreds of news outlets that botched coverage of what scientists say is a dubious study of breakfast cereals and granola bars by virulently anti-GMO Environmental Working Group, a Washington DC-based public health advocacy group.

EWG's Children's Health Initiative

Breakfast With a Dose of Roundup?

Weed Killer in $289 Million Cancer Verdict Found in Oat Cereal and Granola Bars

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By Alexis Temkin, Ph.D., Toxicologist

According to EWG’s resident toxicologist Alexis Temkin:

> Popular oat cereals, oatmeal, granola and snack bars come with a hefty dose of the weed-killing poison in Roundup, according to independent laboratory tests commissioned by EWG. Glyphosate, an herbicide linked to cancer by California state scientists and the World Health Organization, was found in all but two of 45 samples of products made with conventionally grown oats. Almost three-fourths of those samples had glyphosate levels higher than what EWG scientists consider protective of children's health ….

The study was well-timed. EWG appears to have commissioned it to roll-out when a California jury was expected to reach a verdict about whether Roundup, Monsanto's herbicide whose main ingredient is glyphosate, caused a San Francisco groundskeeper to contract cancer. On August 10, in a controversial decision challenged by many scientists, a jury awarded the plaintiff $289 million. In the wake of that verdict, this study unsurprisingly garnered a lot of media attention. But it's always a good idea to double check alarming claims. So the GLP talked to a number of experts, all of whom raised serious doubts about the EWG's claims.

Basic facts

The fundamental, consensus conclusion: A bowl of cheerios, or a daily bowl over months or even many years won't endanger your health. Why? Because we are talking about minuscule amounts of glyphosate—well below the levels that would be considered dangerous. It's almost certain that EWG would have found trace levels of dozens of chemicals (similarly harmless)—if they had tested for any other chemical. But EWG only tested for glyphosate.

For context, let's review a few fundamental facts. First, glyphosate effectively kills weeds, but not much else. Humans and animals don't possess the metabolic machinery—the shikimate acid pathway—used by the herbicide to kill plants. That means glyphosate is not metabolized well in the human body, greatly reducing its potential to do harm.

Image Credit: EWG

Moreover, the herbicide is broken down by bacteria in soil after it's sprayed on food crops and as a result "shows no signs of bioaccumulation in the food chain," according to California's Department of Pesticide Regulation. Trevor Charles, a microbiologist at the University of Waterloo in Ontario, added in an email that "Glyphosate is rapidly degraded by microbes, and also absorbed to soil particles. It does not bioaccumulate."

And while it's true that a sub-agency of the World Health Organization known as the International Agency for Research on Cancer (IARC) linked the herbicide to cancer in 2015, the cancer agency's report was a study of "hazard" and not risk; it did not take into account the impact of exposure. Based on this type of hazard analysis, coffee and salted fish were also considered "probable carcinogens," and no one is clamoring to ban them. The WHO and the UN issued its own far more comprehensive risk analysis, rebuking IARC's cancer finding, and declaring the herbicide safe as used.

And to be clear, IARC did not find any hazard from consuming traces of glyphosate that might turn up in food

that had been sprayed with the herbicide. Agricultural workers exposed to glyphosate faced "limited evidence" of carcinogenicity of non-Hodgkin lymphoma and prostate cancer, but consumers faced no identifiable dangers. The panel also found "sufficient evidence" of carcinogenicity in experimental animals in select studies but were accused by experts of leaving out evidence from many studies that showed no harm and manipulating the interpretation of others. Hundreds of studies, including by the Environmental Protection Agency, have found glyphosate poses no serious health threat to humans.

Related article: Plight of the monarch: Threatened by more than the loss of milkweed food supply

These basic facts seem to refute the hypothesis that glyphosate exposure through food is dangerous. A few contrarian scientists, most connected to the anti-GMO activist movement, have suggested in response that the chemical kills beneficial bacteria living in our gut and could cause a wide range of diseases. They include "inflammatory bowel disease, obesity, depression, ADHD, autism, Alzheimer's disease, Parkinson's disease, ALS, multiple sclerosis, cancer, cachexia, infertility, and developmental malformations," according to MIT computer scientist Stephanie Seneff, who is working far outside her field.

Seneff even goes a step beyond IARC's glyphosate panel, which only found "limited evidence" of carcinogenicity in agricultural workers exposed to glyphosate. Of course Seneff's work was also panned by experts. Writing at her blog ThoughtScapism, cell biologist Iida Ruishalme pointed out that:

> Some studies do exist which suggest a connection [between gut health and glyphosate], but so far they are only sketching hypothetical models, may often be of very poor quality, and their flaws are easy for scientists, and even laymen, to detect if given a careful look.

One of these flaws, Ruishalme explained, relates to the amount of glyphosate someone would have to ingest to cause a problem. Studies that suggest the chemical could harm gut bacteria exposed the microbes to far more glyphosate than EWG detected in cereal:

> To reach that same inhibiting effect they saw in the studies in our gut, one would have to ingest roughly 150 kg or 330 lbs of legumes (as legumes have the highest set limit for pesticide residues, and here we'll assume that batch would come near that limit) at once.

Cereal with a "dose of the weed-killing poison"?

This brings us back to EWG's glyphosate study—which of course was not peer reviewed but was just slapped on the web to leverage the hysteria in the wake of California glyphosate ruling. Charles, the Canadian microbiologist, said the group's conclusion is immediately suspect because, "The work was not peer reviewed." That means the results were not verified by independent scientists. Peer review doesn't guarantee that a study is valid, but it "…. is a necessary component of quality control in science," according to Steven Novella, clinical neurologist at the Yale University School of Medicine.

Lack of peer review may explain why EWG's interpretation of its data is so at odds with what the overwhelming majority of experts say about glyphosate's toxicity. The authors of the study claimed, for instance, that glyphosate "…. was found in all but two of 45 samples of products …. Almost three-fourths of those samples had glyphosate levels higher than …. EWG scientists consider protective of children's health…."

The language here is problematic because it suggests that children are exposed to dangerous amounts of glyphosate. But what level is 'protective of children's health'? EWG has a habit of employing arbitrary standards like this, as University of Wyoming weed scientist Andrew Kniss explained in 2014, which tell us nothing about how realistic exposure to pesticides might affect children.

The United States Department of Agriculture (USDA) maintains a maximum residue limits database for

pesticides to help guide us in evaluating how safe our food supply is. In its most recent report, released in 2016, the USDA wrote, "Over 99 percent of the products sampled .... had residues below the EPA tolerances. Ultimately, if EPA determines a pesticide is not safe for human consumption, it is removed from the market."

Neither agency has concluded that glyphosate should be removed from the market. That's because, as Ruishalme pointed out in her post,

> A [150-lb] person in the US would have to eat …. 62 lbs of produce at the highest level of allowed residue every day in order to reach the limit …. 2 mg glyphosate per [2.2 lbs of] body weight per day. This allowed level …. is set [a] hundred times lower than the level for no observed adverse effects …. in the most sensitive lab animal species tested. It is physically not possible to eat enough of normal produce to reach that level.

EWG detected glyphosate in breakfast foods in the parts per billion range (ppb), which is insignificant to human health.

Image Credit: The Sleuth Journal

"Only trace amounts of glyphosate were found (made possible due to advances in analytical chemistry) and these were far below the levels that are permitted," Charles said. And according to USA Today, ".... the amount allowed in grains [by the EPA] is 30 parts per million."

The levels of glyphosate found by EWG ranged from 0-6% of what are universally considered acceptable levels—30ppm—set by both the US and the EU. And that government-determined level is itself considered incredibly conservative as it is. By the EPA's standard, you'd have to eat 30 bowls or more of cheerios a day, every day, for more than a year to even approach the US limit, which is itself set 100 times or more lower than what might actually harm someone. EWG just made up its own, ridiculous, scare standard, which is 14,000 times lower than the EPA's.

Everything is made up of chemicals, either organic or inorganic. The reality is that the human body has evolved to deal very effectively with minute quantities of chemicals in the world. This is why very few pesticides, most of which are natural, can harm us. Natural chemical pesticides, found in almost every plant, evolved as defensive measures to repel or kill pests like insects that prey on plants. In small amounts, they're not dangerous to us. As biochemist Bruce Ames, of the University of California, Berkeley, and his colleagues explained in a 1990 study ".... at the low doses of most human exposures the comparative hazards of synthetic [and natural] pesticide residues are insignificant."

When you read or hear stories about EWG's explosive study, keep in mind that the group's conclusion departs from the overwhelming expert consensus on glyphosate. The data tell a clear, science-based story about the herbicide and EWG tells another, ideologically-based one. In an email, Mary Mangan, a biologist who has written extensively about glyphosate safety, summed up the situation:

> I don't eat Cheerios. But even if I did, I wouldn't worry about herbicides far-below the levels our scientists have deemed acceptable. Anxiety is worse for you than Cheerios. I try to avoid fearmongers for my health.

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