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Is This Common Herbicide Harming Your Health?

The science on glyphosate, best known as Roundup, still isn't settled.

Associated Press Images

By Knvul Sheikh

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As part of his pledge to “Make America Healthy Again,” Robert F. Kennedy Jr. has said he wants to build an “off-ramp” from the country’s reliance on insecticides and herbicides to grow food.

“The chemicals pollute our bodies the same way that they pollute the soil,” Mr. Kennedy said in 2024. This week, Mr. Kennedy, now the federal health secretary, said that a commission established by President Trump to examine chronic disease rates would look into the use of pesticides, as well as childhood vaccines, microplastics and more.

Mr. Kennedy’s opposition to herbicides, particularly a widely used chemical called glyphosate, has earned support from some environmental advocates, so-called “MAHA moms” and wellness influencers. But some of the claims he and others have made about glyphosate — including that it is potentially linked to cancer, gluten allergies and a variety of other health issues — are based on science that is still not settled.

Prominent organizations have come to markedly different judgments on glyphosate after reviewing the research. In 2015, the International Agency for Research on Cancer classified glyphosateas “probably carcinogenic to humans.” Two years later, the Environmental Protection Agency concluded that glyphosate was “not likely to be carcinogenic to humans” and that it posed “no other meaningful risks to human health when the product is used according to the pesticide label.”

So should you be trying to avoid it? Here’s what the science shows.

How is glyphosate used?

Glyphosate, first sold by Monsanto in 1974 under the brand name Roundup, kills weeds by inhibiting an enzyme that is essential for plant growth. It became the most used weedkiller nationwide after Monsanto introduced genetically modified crops that were resistant to glyphosate’s effects, said Marty Williams, an ecologist with the United States Department of Agriculture’s research service.

Nearly half of all planted acres of corn and soybeans in the United States are treated with glyphosate-based herbicides, as are some crops like tree nuts and grapes. Glyphosate is also sometimes used to dry out or kill wheat, barley, oats and beans, so farmers can harvest them sooner — a process that

environmental groups argue is why the herbicide's residue ends up in pasta, cereals and other processed foods.

Glyphosate is also increasingly used to clear out weeds in other places, such as along railways, and has been popular among home gardeners.

"There's been this explosion of use, so there's several areas where research needs to catch up," said Cynthia Curl, an environmental health scientist at Boise State University in Idaho.

How much glyphosate are we exposed to?

You can be exposed to glyphosate in a number of ways. You could you use an herbicide that contains it; touch plants that have recently been sprayed; or eat (or smoke) after applying the chemical but before washing your hands. You may also encounter glyphosate residue on food you buy in the grocery store.

The E.P.A. has said glyphosate can be safely tolerated at low levels. Tests of randomly selected foods have found that about 96 percent of domestic food samples and 90 percent of imported samples have pesticide residues below the levels the E.P.A. considers safe.

There are relatively few studies of exposure in the general U.S. population compared to data from farmers who work more closely and regularly with glyphosate. One national survey that looked at the urine samples of more than 2,000 people found that 81 percenthad recently been exposed to glyphosate.

Other studies suggest that people who work on farms or live near them face particularly high levels of exposure. One paper found that farm workers had about ten times the amount of glyphosate in their urine as the average person.

"There's pretty compelling evidence that people are getting exposed just by living near these fields, and it's only happening at the times of year when people are spraying glyphosate," said Dr. Curl, whose research has found glyphosate exposure in pregnant women increased the closer they lived to sprayed fields.

Many studies looking at glyphosate exposure measure urine levels, but just the presence of the chemical in someone's urine doesn't mean it will necessarily cause harm, Dr. Curl said.

So can it make you sick?

Scientists are still trying to figure out the level which glyphosate could be problematic. But gathering data on human health effects has been tricky because there are so many variables, said Luoping Zhang, a toxicologist at the University of California, Berkeley.

For example, studies in the lab show that less than 2 percent of glyphosate is absorbed through the skin and about 30 percent is absorbed if ingested, which should mean that most of the chemical is not able to cause any problems in the body. But in reality, many other chemicals are mixed in with glyphosate in herbicides. Experts disagree on whether these other chemicals might add to glyphosate's toxicity, or if they themselves are the underlying cause of any health effects.

In laboratory studies of human cells and in animal research, scientists have found evidence that glyphosate can induce DNA damage and change the way genes are expressed, among other effects. This, in turn, has been linked to higher levels of inflammation, as well as damage to liver and kidney tissues in animals.

Some epidemiological studies have suggested that glyphosate is associated with an increased risk of non-Hodgkin's lymphoma among farmers and farm workers; different studies haven't found a link.

A few research reviews have suggested glyphosate may also affect the endocrine system or interfere with nervous system development. And some research has suggested that it is possible for glyphosate to alter the gut microbiome, because the enzyme it acts on exists in bacteria.

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Because of its potential to affect gut bacteria, a few researchers have hypothesized that glyphosate may be linked to an increase in celiac disease and gluten intolerance rates, an idea Mr. Kennedy has echoed. However, some scientists have criticized this claim, with one group arguing in a paper that it is "not supported by the available scientific evidence" and that suggesting otherwise "misleads the public, the scientific community, and regulators."

Another caveat: Many studies on glyphosate toxicity rely on data from animals or human cells, often exposed at higher levels than most people would typically encounter. That said, experts are getting better at investigating doses more relevant to the average person, Dr. Zhang said.

Monsanto, which is now part of the biotechnology company Bayer, has maintained that glyphosate is safe at the level that most people are exposed. While denying that the herbicide can cause cancer, Bayer has spent approximately $11 billion to settle lawsuits alleging that glyphosate exposure caused cancer and has paid millions in damages to some plaintiffs. These plaintiffs include a man represented by Mr. Kennedy and his legal team.

Still, pressure from advocacy groups and community members has pushed lawmakers to ban or curtail the use of glyphosate in parks and playgrounds in cities including New York, Los Angeles and Baltimore. And in 2023, Bayer announced it would stop selling glyphosate for home gardeners.

What does this mean for you?

At this point, most experts agree that the risk to the general population is probably low.

Still, if you want to try to minimize your potential exposure, there are a few ways you can do so in the kitchen. Some experts suggested washing produce under running water may be somewhat helpful in reducing pesticides. Peeling or boiling produce may reduce pesticides more, though this may also affect a food's nutritional value. But Dr. Curl argued that there isn't much evidence to show that these methods would help reduce glyphosate residue specifically.

The best way to reduce exposure to glyphosate and other chemicals may be by switching to organic food when possible. Some small studies have shown this can cut urinary pesticide levels. You may want to prioritize eating organic

versions of foods made with oats, wheat or beans, which are treated with glyphosate closest to the time of consumption.

There are pressing concerns about the health risks to people living or working on or near farms, Dr. Curl said. But there are still a number of unanswered questions about what's driving those risks, including whether they're being exposed to particles blowing in the wind during spraying, or through exposure to soil that ends up in household dust.

"We need more research to be sure before we start telling people what they can do," Dr. Curl said.

Knvul Sheikh *is a Times reporter covering chronic and infectious diseases and other aspects of personal health. More about Knvul Sheikh*

https://www.nytimes.com/2025/02/19/well/glyphosate-health-cancer.html?smid=nytcore-ios-share&referringSource=articleShare

As ever, when an industry gets settled in controversial ways, the deep-pocketed defensiveness knows no bounds. I have come across at least one court case where Roundup was deemed carcinogenic with damages ordered. Yet after decades of glyphosphates, the ag-business industry has managed to keep the picture muddled and confused enough that "the science on glyphosphate, best known as Roundup, still isn't settled."

Two things I believe Knvul missed: (1) If Roundup is so harmless, why to breweries refuse to buy barley that has been dessicated before harvest? A farmer back home tried to get away with it, but got caught, with the hefty fine proving to be the final blow sinking his operation. Dessication seems like an especial abomination utilized just to allow big-scale industrial farmers to voraciously harvest their humungous acreages within harvest weather windows. (2) Weed resistance to glyphosphates, with plants like Palmer's amaranth, has reached the point where the industry grudgingly admits that another generation of weedkillers is needed, still not ready, with nothing likely that will safely approach Roundup's power in its prime. We may assume Roundup is being over-sold on its weed control power now.

Back in the early days of herbicides, I can remember dipping my hands in Avadex BW and Treflan. How ignorant we all were! Farmers have all sorts of health risks accruing. But the bigger the farms get, the less the actual owner/operator "farmer" will be doing the dangerous grunt work himself. TJB