

1. Mark your confusion.
2. Show evidence of a close reading.
3. Write a 1+ page reflection.

Are GMOs Safe? Breaking Down the Science of Science-ified Foods

Source: Jamie Ducharme, Time.com, January 5, 2024

Thirty years after tomatoes became the first genetically modified produce sold in the U.S., lots of people remain skeptical of science-ified foods. In a 2020 Pew Research Center survey, just 27% of Americans said they felt genetically modified foods are safe to eat, while 38% said they're unsafe and 33% weren't sure.

That's not only a U.S. phenomenon. In the Philippines, for example, activists have been protesting the production of Golden Rice, a type of genetically modified rice harvested at scale for the first time last year. Unlike regular rice, Golden Rice is engineered to contain beta carotene, an addition meant to counter vitamin A deficiency and resulting vision loss. But opponents argue the rice has not been through adequate testing and that there are safer and healthier ways for people to consume vitamin A. "Golden Rice is simply not the solution to the wide, gaping wound of hunger and poverty," a representative from MASIPAG, a Philippines-based, farmer-led group that opposes Golden Rice, told *Time* in a statement.

Golden Rice is only the latest example in a long history of anti-genetically modified organism (GMO) sentiment. Over the years, protesters have torn up fields where genetically modified crops were planted and marched in the streets to criticize companies that produce GMOs. Much of the public's concern seems to stem from fears that gene editing could introduce new toxicity into old foods; make foods more allergenic; or lead to disease-causing genetic mutations in the humans who eat these altered plants or animals. Since-debunked animal research from the 1990s also caused some people to believe that eating genetically modified food leads to organ damage.

Even though the U.S. Food and Drug Administration (FDA), U.S. Department of Agriculture, and U.S. Environmental Protection Agency—which work together to regulate GMOs and make sure they meet food-safety standards—say they are safe, many people remain wary of these science-enhanced foods. "Technophobia is a very common problem," says Trey Malone, an agricultural economist at the University of Arkansas. "It's this rosy retrospection that assumes that things used to be better back when. That leads to this belief system that creates pushback against gene-edited and GMO foods."

What many people don't realize, Malone says, is that humans have tinkered with their food for a very long time. Even thousands of years ago, farmers would save the best seeds from their harvests and use them to optimize future yields, sometimes breeding them with other plants to create even more desirable crops in years to come. Modern corn wouldn't exist without this kind of selective breeding; nor would bananas, apples, and broccoli as we know them today. Many of the produce varieties currently available in grocery stores, like pluots and broccolini, are also a result of cross-breeding two species to create a new one.

Genetic modification is a related but more scientifically advanced process that involves making targeted tweaks to a plant or animal's DNA to change or create specific traits. This process can be used to alter a food's flavor, nutritional content, appearance, or defenses against pests like crop-killing insects, and has given rise to foods including Fresh Del Monte's pink pineapples and non-browning Arctic apples. But while these flashy products grab lots of headlines, the truth is they make up only a fraction of the GMOs sold in the U.S.

Fred Gould, a professor of agriculture at North Carolina State University who chaired a 2016 National Academies of Sciences, Engineering, and Medicine report on genetically engineered crops, often leads educational sessions on GMOs. He likes to show a photograph of a supermarket produce section and ask how many of the vegetables in the picture are genetically modified. He gets lots of guesses as high as 90%—but the right answer is zero.

There are a handful of genetically modified fruits and veggies on the market, including summer squash, papayas, and the aforementioned pineapples and apples. And within the past decade, the FDA has approved genetically modified salmon (which grows faster than regular fish) and pork free of a specific allergen. But in the U.S., GMOs are much more likely to show up in processed foods like cooking oils, soy products, sweeteners, and snack foods. Almost all of the soybeans, corn, sugar beets, and canola planted in the U.S. are genetically modified, mainly for resistance against insects or pesticides. These crops are then used to make many of the packaged foods most Americans eat every day.

By eating these foods, the average American has for decades been part of a “natural experiment,” Gould says. People in the U.S. and Canada have been eating GMOs for decades, whereas they’re consumed less frequently overseas. If GMOs were linked to serious health problems, researchers would expect to see them reflected in comparisons of the health of North Americans relative to Europeans. But “when we look at the data,” Gould says, “we don’t see any signs.” Indeed, researchers have found no evidence of GMO-related increases in cancer, obesity, kidney disease, gastrointestinal issues, autism, or food allergies in the U.S. and Canada versus Europe. Research in animals has also shown no evidence that consuming GMOs causes genetic mutations, organ damage, or fertility problems.

“We’re very careful about saying there are no effects. We haven’t *found* any effects,” Gould says. There’s always a chance new risks could come to light with time, he says, but he feels that’s unlikely based on what the science has shown so far.

Malone agrees that, based on the available research, there’s no clear reason to fear genetically modified foods and plenty of reasons to embrace them. Gene-editing can not only make foods more nutritious, but also streamline their production processes to improve sustainability, he says. Planting genetically modified crops, research suggests, may increase yields and allow farmers to produce more food on less land, while simultaneously cutting down on chemical pesticide use. Meanwhile, fast-growing genetically modified salmon theoretically requires fewer resources to raise compared to conventional fish.

As Malone sees it, innovations like these are the strongest reason for people to embrace GMOs, particularly as it becomes clear that the status quo isn’t serving the planet or its people. “Production systems across the planet are realizing that we are going to have to confront climate change. We are going to have to adapt,” Malone says. “Agriculture can be part of the solution.”

Possible Response Questions

- What are your thoughts about genetically-modified food? Explain.
- Did something in the article surprise you? Discuss.
- Pick a word/line/passage from the article and respond to it.
- Discuss a “move” made by the writer in this piece that you think is good/interesting. Explain.