

the new food fight

FOODS CONTAINING GENETICALLY ENGINEERED INGREDIENTS ARE ALMOST EVERYWHERE. HERE'S WHAT FAMILIES NEED TO KNOW ABOUT THESE POTENTIALLY DANGEROUS FOODS.

By Marygrace Taylor Photographs by Peter Tak



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ere's a startling fact: Every day, most of us—even natural food enthusiasts—eat foods that contain ingredients whose DNA has been altered in a science lab. Whether it's the string cheese kids pull apart at lunch or the popcorn you snack on after dinner, there's a good chance the item in question includes genetically modified organisms, which some experts say could have harmful consequences for people—especially kids.

Here, an in-depth look at GMOs' effect on our health and the environment, plus how you can keep your family safe.

what are GMOs?

Genetically modified organisms, also known as genetically engineered (GE) food, have DNA that has been altered in a way that does not occur in nature. While natural selection and traditional agriculture can change a plant's DNA structure over a long period of time (for example, quinoa has developed a soapy coating to repel insects, and farmers continually replant the seeds of their juiciest tomatoes to yield a juicer breed over time), the biotechnology responsible for creating GMOs is far quicker: In a lab, desirable genes are inserted into a plant's cells, becoming a part of the plant's DNA. The result is a new version of the plant.

What's the advantage to speeding up or changing the natural course of a plant species' development? Supporters of GMOs hail biotechnology as a solution to the problem of world hunger, claiming that the genetically engineered crops are hardier and produce higher yields than their conventional counterparts, though some research indicates GMOs haven't actually succeeded in producing these mega-yields. "[The world hunger reasoning] has been a way to broaden GMOs'

SUPPORTERS OF GMOS HAIL BIOTECHNOLOGY AS A SOLUTION TO THE PROBLEM OF WORLD HUNGER. DETRACTORS CALL GMOS AN UNCONTROLLED SCIENCE EXPERIMENT.

appeal to politicians and consumers," says Charles Benbrook, Ph.D., chief scientist at The Organic Center, a non-profit focused on the environmental and consumer health benefits of organic food and farming. "The initial application of genetic engineering in crop production was to try to simplify the management of weeds and certain insects," he says.

Today, there are two types of GE crops: Bt-insect protected crops, and

crops created to tolerate the herbicide Roundup (produced by the company Monsanto). Bt is short for bacillus thuringiensis, a biological pesticide; these crops, which make up about one-third of the land planted with GE crops, have a gene that allows the plant to create

its own insecticide, reducing the need for farmers to spray crops with pesticides. More common are the crops created to tolerate Roundup, nixing the need for the cocktail of less-potent herbicides farmers previously relied on. GMOs were developed to work with Roundup, but it didn't take long before a new species of resistant weeds emerged, prompting food producers to douse crops with even more of the chemical. "Now, the biotech industry is trying to combat the resistant weeds by trying to create plants that can tolerate multiple herbicides, so even more chemicals can be applied to kill weeds," Benbrook says. "Even with the success of Bt crops, GMOs on the whole have increased—not decreased—pesticide use."

are GMOs dangerous?

While GE crops' reliance on chemical pesticides make them potentially harmful to people and the environment (just like other conventional fruits and vegetables), it's the changes to the plants' DNA sequences that cause GMOs to be of special concern to some experts. Animal studies have linked GMOs to health problems, says the American Academy of Environmental Medicine (AAEM), an international association of physicians that focuses on the interaction between humans and the environment. Mice fed genetically modified corn for a period of 30 to 90 days developed intestinal inflammation in a 2008 Italian study, while rats that ate GE corn in a 2004 French study showed changes in their blood cells, livers, and kidneys, which researchers believe could indicate the onset of disease. AAEM urges physicians to recommend GMO-free diets to their patients.

But there are plenty of people and organizations who aren't convinced that there is any harm in GMOs, including: the Food and Drug Administration, which doesn't require labeling to show whether a food is genetically modified; the U.S. Department of Agriculture, which continues to approve the planting of GMOs; and the American Academy of Pediatrics, which doesn't have a stance on whether parents should avoid feeding GE foods to their children. "There are individuals in the scientific community who claim great dangers and harm based on a small study," says Nina Fedoroff, Ph.D., a professor at Penn State University who is also a molecular biologist and geneticist. "The overwhelming weight of the scientific evidence is that GE crops are no different from crops modified by older techniques."

It's true—results based on mice don't necessarily translate to humans, and plenty of research indicates that GMOs don't harm people. But “the majority of the scientific evidence [supporting GMOs] has been generated by the biotech industry, which has restricted independent, peer-reviewed research,” says Megan Westgate, Executive Director of the Non-GMO Project, a nonprofit that works to preserve and build sources of non-GMO products. “So while the safety statement isn't necessarily untrue, it's because there's more independent research still needed.” What's more, it would be nearly impossible to truly measure how GMOs affect people, since genetically modified foods are eaten by almost everyone, almost every day. “Foods with GMOs make up the vast majority of what's available to consumers, so there's no non-GMO eating group we can compare against,” says Ali Carine, M.D., an integrative pediatrician in Columbus, Ohio.

The pervasiveness of GMOs, with their altered DNA, is a serious concern, say some experts. “It's an uncontrolled experiment,” says Martha Herbert, M.D., a pediatric neurologist and former board member of the Council for Responsible Genetics. “We have no evolutionary history with this, so we don't really know what we might trigger.”

Fueled by concerns like these from

consumers, 30 countries—including Japan, Australia, and England—have taken measures to restrict the sale of GE foods. Since 2001, products containing more than 1 percent genetically engineered ingredients require a label in the European Union where, not coincidentally, much of the independent research on GMOs has taken place. So why isn't the U.S. doing more?

The answer boils down to big business: Corn and soy—two of the biggest GE crops—play an enormous role in the United States agriculture industry (much less so in Europe); farmers planted nearly 87 million acres of corn and nearly 76 million acres of soy during the 2009-2010 season alone. So it made sense for the U.S. Department of Agriculture to back the development of GMOs during the early and mid 1990s in an attempt to boost crop yields. “It would be profoundly disruptive to U.S. agriculture and our food system if evidence emerged that these crops posed some new and novel health risk,” says Benbrook. In addition, the country's biggest food and agriculture companies would lose money.

are kids at greater risk?

If GE foods are harmful to people, they'd only be more so to kids, says Jeffrey Smith, author of *Genetic Roulette: The Documented Health Risks of Genetically Engineered Foods*. “Their smaller bod-

ies and rapid development rates could make babies and kids even more susceptible to the health problems associated with GMOs,” he says. “And since kids tend to consume more processed foods containing ingredients that are likely to be genetically modified (like GE soy in infant formula, or GE corn in crackers or cereal), the dangers are compounded.”

There are other kid-specific issues experts are concerned about, too: the possible connection between GMOs and food allergies, and even attention deficit hyperactivity disorder and autism. “There's this cluster of new health problems related to the autoimmune system in U.S. children where science has shown there may be a common trigger,” Benbrook says. “Children's exposure to some of the novel proteins in GE foods may have played a role in making them more susceptible to allergies, and in addition, this suite of related autoimmune disorders.”

GMOs were introduced in the mid 1990s, and in the last ten years, Carine, the Columbus, Ohio, integrative pediatrician, has seen a marked upshot in the number of babies who have difficulty tolerating breast milk due to the foods moms are eating. “I see extreme colic or rashes more today in breastfed babies than formula-fed ones, and I suspect it may be that moms are unknowingly passing along harmful food molecules in their breast milk,” she says. Usually, moms see an improvement after cutting out cow's milk (most dairy cows eat GE feed), corn, and soy. “I don't know whether it's the GMOs that are causing this, but I do know I've watched this trend grow at a disturbing rate.”

The Food and Agriculture Organization of the United Nations and the World Health Organization have jointly developed a series of protocol used by countries all over the world for evaluating the allergenic nature of GMO foods—but since the U.S. government maintains a stance that GE foods are safe, it has not used the guidelines or developed its own set.

how you can protect your family

At first glance, the solution seems simple: Avoid foods containing genetically modified organisms. But unfortunately, the ever-expanding reach of genetically engineered foods means it's becoming more and more difficult to avoid them completely. GMOs show up in the vast majority of packaged foods, and new GMO crops are continuing to be deregulated by the government, further contaminating the food system. If you buy natural and organic foods much of the time, you may be ahead of the game—but not necessarily so. Here, ways you can significantly reduce your family's exposure:

STEP ONE:

Know the big GE foods

First, the good news: Currently, there are only nine GE crops in the U.S. food system. The majority of soybeans, canola seeds, corn, and cotton (which can be used to make cottonseed oil) are genetically engineered; small amounts of zucchini, squash, and Hawaiian papaya are also genetically engineered. This past January, the USDA approved genetically modified alfalfa, a purple flowering plant that people don't usually eat, but is often fed to livestock. And, beginning in May, farmers will again be allowed to plant GE sugar beets (planting was approved by the USDA in 2005, but courts ruled against it in 2010).

The bad news? These crops tend to end up in just about everything. Processed versions of soy, canola, and corn (like soy lecithin, canola oil, and high fructose corn syrup) find their way into about 80 percent of packaged food items like cereal, salad dressing, canned soup, soy-based meat alternatives, and infant formula. Soy and corn, along with alfalfa, are fed to the cows, pigs, and chickens that produce conventional meat, milk, and eggs. Many more foods also contain cottonseed or canola oil, plus sugar from sugar beets.

STEP TWO:

Choose safe alternatives

Unlike countries in the European Union, the United States doesn't require foods containing GMOs to be labeled, so it's better to choose foods that specifically indicate they're GMO-free, like those tested by the Non-GMO Project (see “Know Your Labels,” opposite page). Many major natural and organic brands currently participate in the program, including Silk, Organic Valley, Eden, and Whole Foods Markets' store-brand products (find a full list at nongmoproject.org). “People can look for the Non-GMO Project seal and trust that rigorous practices for GMO avoidance have been followed,” says Westgate. Another option: Check out the True Food Shopper's Guide, a comprehensive list of GMO brands and their non-GMO counterparts from the Center for Food Safety, a nonprofit environmental and public health organization (centerforfoodsafety.org).

USDA-certified organic foods are the next best option, but since GE crops can be grown in close proximity to organic ones, they aren't entirely immune from potential cross-pollination. Pollen from a GE crop can blow into the field of an organic crop and potentially intermingle with the organic crops' reproductive system, causing the GE DNA to get into the organic crops' DNA. “But in general, we know the risk of contamination to organic foods is significantly lower than to conventional foods. Organics are a good place to look to avoid GMOs, but consumers should still look for certified non-GMO products when possible,” Westgate says.

What about foods without packaging—like fruits, vegetables, and meat? For now, the vast majority of fresh fruits and vegetables are safe. The exceptions are some zucchini, yellow squash, Hawaiian papaya, and sweet corn—small amounts of which are genetically modified. Here, it's advisable to buy organic or from a local farmer who can guarantee his crops aren't genetically engineered (you can also ask if

he is near any large-scale GE farms that might cause cross-contamination). Less reassuring is the fact that “conventional chicken, cows, and pigs have been raised on a near-complete diet of GM corn, soy, and now alfalfa,” says Benbrook—so concerned families should choose certified organic, 100 percent grass-fed meats whenever possible.

STEP THREE:

Stand up for your health

The U.S. government is likely to continue to support GMO foods. The USDA's January ruling in favor of genetically engineered alfalfa means more foods will contain GMOs, and organic crops risk further contamination from cross-pollination. Even major players in the fight against GMOs, like Whole Foods Market and the Organic Trade Association, say that a co-existence between organic, GMO-free food, and genetically engineered food may be the best option available for now, since the government hasn't established further organic-protecting regulations. Others, like the Organic Consumer Association, want to push for mandatory labeling of foods containing GMOs with a grassroots campaign, Millions Against Monsanto. (To find out how you can sign petitions and volunteer for the cause, visit millionsagainstm Monsanto.org.) The best way to support organics? Use the power of your purchases. “In Europe, consumer rejection was achieved—and brands removed GMOs from their products. If enough American consumers stop buying GMO foods here, it could make the same impact,” Smith says. The bottom line: The choice for what to feed your family should always be yours. ●

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KNOW YOUR LABELS

Natural, organic, non-GMO, oh my! How different food labels and claims stack up—and what they mean for families.

“Natural” or “all natural” Potentially indicates that a product is free of artificial ingredients. But since the terms are currently unregulated, a product can claim it's natural without actually being *all* natural—like “natural” granola bars made with high-fructose corn syrup. “Natural” products can contain GMOs, unless the label states otherwise.

Organic Meets the certification standards set forth by the USDA National Organic Program, which require a food to be free of chemicals and artificial ingredients. Technically, the guidelines state that certified-organic foods can't contain GMOs, but due to the risk of cross-contamination (and the lack of government testing for GMOs), a small chance still exists.

Non-GMO Project Verified Foods that have been tested and certified to contain less than 1 percent genetically modified organisms through the Non-GMO Project (the only third-party verification program in the U.S.). Most likely, they're also organic.

