

WHAT YOU
NEED TO
KNOW **NOW**

The
**Uncensored
Truth**

about **GMO
FOODS**

This material
was adapted and
expanded from
an original piece
in *Clean Eating*
magazine.

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DISCLAIMER

It's not easy to publish material critical of GMO foods.

Most magazines, television stations, and media outlets in general have deep ties to companies that depend on genetically modified organisms (GMOs). The entire industry known as Big Food owes its existence to packaged foods, and it spends big bucks to advertise them everywhere. Packaged foods are filled with GMOs. Media outlets—particularly print media—are understandably reluctant to publish stories that might be viewed as highly critical of the advertisers that are the lifeblood of their publications.

And it's not just the advertisers. Monsanto is the company that frequently comes off as the villain in pieces on GMO, for reasons you'll soon understand. It has annual net sales larger than the entire industry of Major League Baseball, and it spends millions on lobbying and public relations. Monsanto, DuPont, and other big players in the GMO wars spent more than 45 million dollars in California alone to defeat Prop 37, a proposition that would have made GMO labeling on food products mandatory.

No publisher wants to be on the wrong end of a lawsuit from a company with endlessly deep pockets, and the possibility of such a lawsuit makes the legal team at most publishing and media companies very nervous. I know this from experience.

So let's be clear on this disclaimer. There are no black-and-white answers in this huge experiment called genetic modification of foods, so it is always possible to dispute conclusions and argue about the meaning of data. That said, these are *my* observations, conclusions, concerns. They are my reading of the literature. No one but me is responsible for them. They do not constitute medical or health advice, and you should not take them as such.

I am a nutritionist, a consumer advocate, and an investigative writer in the field of health and nutrition. This report is not the final word on GMO foods. In fact, the whole point of this report is to show clearly that we have *no idea* what the final word on GMO foods will turn out to be. GMO is a huge, uncontrolled food experiment, and it is on a scale unlike any seen in history.

This is my personal report to you, the consumer, about the conclusions I've reached in my investigations. If my family asked me what I thought about GMO foods, this is what I would tell them. This is what I would want the people I love to know.

The publisher is not responsible for my opinions. They are mine alone. My hope is that this report will stimulate thought and discussion on this very important issue.

Warmly,
JB

GMO Foods: It's What We Don't Know That Matters

The subject of GMO foods is one I stayed away from for a long time. I admit I wasn't paying strict attention to all the brouhaha and controversy. I was focused—as I have been for most of my career—on nutrition, weight loss, diabetes, and heart disease. And, not having looked into the subject deeply, I secretly thought the hysteria about GMO was a bit of a tempest in a teapot. After all, I reasoned, we've been playing around with mixing genes for a long time—that's why we have 125 different breeds of dogs in the American Kennel Club. It's why we have hybrid roses, heirloom tomatoes, and golden doodles—or so I thought. What could be so bad about genetically modifying rice so that it has more protein?

Honestly, I was beginning to think that perhaps the anti-GMO crowd was erring a bit on the side of tree huggery.

But after spending approximately 100 hours reading about GMO from all points of view, watching countless documentaries, attending the American College of Nutrition conference debate on GMO, and reading dozens upon dozens of peer-reviewed studies on issues directly related to GMO (such as leaky gut syndrome), I am here to say this:

I was wrong.

I now firmly believe that the wholesale introduction of genetically modified foods into the human food supply ranks right up there with global warming in terms of its overall importance for the health of the human race.

Before I explain that statement—and, believe me, I will—let's begin with some definitions.

WHAT EXACTLY IS GMO?

GMO simply stands for genetically modified organism. It means that the genes from one species have been spliced onto the genes of an entirely different species. That's what makes it fundamentally different from mere "breeding." Breeding—or genetic *manipulation*—is when you cross a golden retriever with a poodle and get a golden doodle. Genetic *modification* is a whole different ball game.

"The very process of genetic engineering produces unpredicted side effects," says Jeffrey Smith, founding director of the Institute for Responsible Technology and the maker of an acclaimed film on GMO called *Genetic Roulette: The Gamble of Our Lives*. "They're putting spider genes into goats so that their milk will have spider proteins," he explains.

Smith also says, "Cow genes [are being inserted into] pigs so that their hides will be more like cowhide, human genes into corn to make spermicides." I'll pause for a moment while you ponder the spermicide-producing corn. (Don't worry, we'll come back to it in a minute.)

All of this doesn't just *sound* worrisome—it *is* worrisome, and here's why.

The Food-Gut Connection

Let's start with the gut, the primary interface between food and the rest of your body. The gut wall is a complex system of defenses against unfamiliar, and potentially damaging, compounds. You can think of it as a tightly woven mesh fence whose openings are just large enough to allow small, friendly, recognizable breakdown products of digested food (such as amino acids or glucose) to pass through and enter the bloodstream. Simultaneously, the gut wall is charged with preventing stuff that doesn't belong in the bloodstream from getting in.

The gut is our biggest immune-system organ. When those tight junctures in the gut wall weaken—a condition known as *intestinal permeability*, or leaky gut

syndrome—all hell can break loose. It's the equivalent of unidentified flying objects getting into the Pentagon. The Pentagon assumes the unidentified invaders mean us harm, and it starts firing full blast. This is exactly what the immune system does when it's faced with unidentified—and potentially toxic—molecules.

When the body's defense system doesn't recognize a molecule as a friendly, law-abiding citizen of the body, its first response is inflammation. The more the gut wall is weakened by these inflammatory responses, the more "foreign invaders" get through its border, causing even more inflammation. It's a vicious and exhausting cycle that ultimately leaves the poor immune system overwhelmed.

Think for a moment about gluten intolerance. In many people, gluten—a protein found in grains—causes irritation to the gut wall. This irritation leads to inflammation and that, in turn, leads to a weakening in the normally tight junctures of the gut wall. The molecular "riffraff" now have a much easier time getting through the border into the bloodstream, and that invariably leads to additional inflammation and further weakening of the immune system defenses. Some have even suggested that the doubling of peanut allergies and the 265 percent increase in hospital admissions for food reactions since the introduction of GMO foods in 1996 might be connected to this cycle of inflammation and weakening of the immune system.

Martha Grout, M.D., medical director of the Arizona Center for Advanced Medicine, puts it this way: "Many of the diseases that we deal with—in fact *most* of the diseases that we deal with—(begin with) inflammation. For many of them, the source of that inflammation is the gut, which of course is the main interface between the body and food of any kind including GMO food."

With GMO food, you are taking a combination of genes that does not exist in nature—let alone in

the human diet—and putting it into food which will ultimately come in contact with your gut wall. Our immune system looks at these unfamiliar, Franken-molecules and says, "Whoa! I've never seen this thing, it must be a foreign invader." So, it makes a quick and wise decision to attack. And this creates an inflammatory response, essentially setting the stage for a host of conditions—none of them good.

"Intestinal permeability is a likely cause of various pathologies, such as allergies and even metabolic or cardiovascular disturbances," write the authors of a 2010 paper exploring links between food processing and leaky gut syndrome. In fact, numerous gut diseases have increased exponentially since GMOs were widely introduced into the food supply, including ulcerative colitis, chronic constipation, gastrointestinal infections, Crohn's disease, and gastroesophageal reflux (GERD). "But inflammation goes way beyond just gut disorders," points out Grout. "I think we should look at allergies, autoimmune disease, heart disease, kidney disease, diabetes—anything that's related to inflammation."

Inflammation is at the heart of every degenerative disease, including cancer, diabetes, obesity, heart disease, and Alzheimer's.

The arguments *for* GMO are basically economic. Advocates point out that using genetic modification can reduce pesticide use and benefit farmers. It can increase yields. It may reduce energy use and benefit the environment. And it may make it possible to feed the rapidly expanding population of our planet.

Indeed, much of this might be theoretically possible. While the science of genetic modification may *ultimately* be used for the greater good, so far

it has *mostly* been used to produce crops, such as genetically modified Roundup Ready soybeans, which now constitute 94 percent of the soybeans in the United States, or the aforementioned corn, 88 percent of which is genetically engineered to produce its own toxic insecticides.

Roundup Ready: What Does It Mean?

“Weed management is the main problem in agriculture,” says Thierry Vrain, Ph.D., in his TEDx lecture on GMO foods. The most common way to manage weeds is with herbicides, and the most popular and well-known of these is the Monsanto Company’s Roundup. When it was discovered that a particular type of bacteria was impervious to Roundup, Monsanto took the gene from that bacteria that allowed it to survive Roundup and began inserting it into soybeans. The result was a genetically modified soybean known as Roundup Ready. These soybeans are specifically engineered to survive massive sprayings of Roundup, which is used for killing weeds and also as a desiccant for drying out crops.

The main ingredient in Roundup is a broad-spectrum herbicide known as glyphosate. Glyphosate is used to control unwanted plant life—weeds, grasses, basically anything that competes with commercial crops. There’s been vigorous debate about the safety of glyphosate ever since it was first registered for use in the U.S. in 1974.

According to studies presented by Vrain at the 2014 annual conference of the American College of Nutrition, glyphosate is an antibiotic—killing some of the best bacteria in the microbiome, including *bifidobacterial* and *lactobacillus*. The health of the microbiome, which contains more than 1,000 different species of bacteria, is one of the hottest topics in nutritional medicine right now—and for good reason. It’s been found to influence everything from immune

response to obesity to depression. One study showed that if you experimentally wipe out members of just four common families of bacteria in lab animals—*Lactobacillus*, *Allobaculum*, Rikenellaceae, and *Candidatus Arthromitus*—it causes the animals to become obese.

The health of the microbiome is the reason we’re told to eat yogurt with its rich array of beneficial bacteria called *probiotics*. And the ability of glyphosate to mess with that delicate balance of bacteria so needed for optimal health is something that should be taken very seriously. One alarming study, published in *Current Microbiology*, showed that glyphosate kills bacteria even at the incredibly tiny concentration of one part per million.

As I write this, the Environmental Protection Agency (EPA) is considering a new regulation that will make it permissible for oils, such as flax, soybean, and canola oil, to contain glyphosate at levels up to forty parts per million, which, according to a study in the journal *Food & Chemical Toxicology*, is more than 100,000 times the concentration needed to cause breast cancer cells to grow.

And that’s not all. Glyphosate suppresses enzymes in the liver (known as the cytochrome P450 enzymes), meaning it compromises detoxification in the body. The authors of the paper demonstrating this effect said that “glyphosate *enhances* the damaging effects of other food borne chemical residues and environmental toxins,” adding that “negative impact on the body is insidious and manifests slowly over time as *inflammation damages cellular systems throughout the body*” (emphasis mine). They caution that the consequences of this include “most of the diseases and conditions associated with a Western diet, [including] gastrointestinal diseases, obesity, diabetes, heart disease, depression, autism, infertility, cancer, and Alzheimer’s disease.”

Glyphosate has been shown to be an endocrine disrupter in human cells. (Translation: It screws around

COMMON INGREDIENTS DERIVED FROM GMO RISK CROPS

Amino acids, aspartame, ascorbic acid, sodium ascorbate, vitamin C, citric acid, sodium citrate, ethanol, flavorings (“natural” and “artificial”), high-fructose corn syrup, hydrolyzed vegetable protein, lactic acid, maltodextrin, molasses, monosodium glutamate (MSG), sucrose, textured vegetable protein (TVP), xanthan gum, vitamins, yeast products.

with your hormones.) Glyphosate changes human cell permeability, induces human breast cancer cell growth via estrogen receptors, amplifies toxicity and accelerates cell proliferation (i.e., cancer) at tiny concentrations (measured in parts per billion to parts per trillion). Stephanie Seneff, Ph.D., a senior researcher at MIT, published a paper suggesting that glyphosate may even explain the link between a damaged microbiome and gluten intolerance.

In fairness, not all studies on glyphosate have been damning. One published research review gave glyphosate a clean bill of health. It said that in the studies they reviewed no “significant toxicity occurred,” there was no “convincing” damage evidence for DNA damage, and glyphosate does not appear to be carcinogenic.

But keep in mind that most of the damage that’s been demonstrated in the research is subtle and slow to develop. A three-month study looking for “acute toxicity” in glyphosate might find none but might be missing the insidious, metastasizing damage that it does to critical systems in the body (like the gut wall and the microbiome) that happens over many years.

Here’s a critical point: the studies showing that glyphosate is safe were all done on *pure glyphosate*, not on *Roundup*. That means they are not studies of the actual herbicide, which is a proprietary mix of glyphosate and other ingredients. As Vrain notes, while glyphosate itself has “no *acute* toxicity,” the actual Roundup herbicide contains a lot more than just glyphosate. The importance of that can’t be overstated. Those “other ingredients” amplify the effects of glyphosate, making the combination much worse than glyphosate alone. For example, about 15 percent of Roundup is comprised of an extremely toxic chemical called *polyoxyethylene amine* (POEA), which makes glyphosate much more dangerous. One study, published in *BioMed Research International*, found that Roundup is 125 times more toxic than glyphosate alone.

Here’s a factoid that always gets the attention of my male audience—and for a very good reason. Roundup—complete with its POEA component—was tested by researchers and found to induce cell death in the testicles of animals. It also produced a 35 percent reduction in testosterone levels at the astonishingly low level of one-part Roundup per million.

Still other research showed that glyphosate is toxic to human placental cells in concentrations *lower* than those found typically in agricultural use. Even worse, the effect *increases* when glyphosate is combined with the other stuff found in Roundup (like, presumably, POEA). The researchers concluded that “endocrine and toxic effects of Roundup, not just glyphosate, can be observed in mammals,” adding that the presence of the other components in Roundup *significantly increase* the likelihood that this stuff will stay in your system. “Roundup is always more toxic than its active ingredient (glyphosate),” they conclude.

Worth noting is that the legal residue level for glyphosate, increased by the EPA in 2013, is 30 parts per million for cereal, 100 parts per million for animal

feed, and 120 parts per million for soybeans. Did I mention that the 35 percent reduction in testosterone in male rats was seen at a mere *one part per million*?

What's the Matter with Corn?

And now, as promised, let's return to that insecticide-producing corn I mentioned earlier.

One of the most effective biological insecticides for corn is a soil-dwelling bacteria called *Bacillus thuringiensis*, also known as *Bt*, or the *Bt* toxin. If you're a farmer, you spray this stuff on corn, and boom, that's the end of your pest problem. The *Bt* toxin dissolves in the gut of the insect, attacks its gut cells, punching holes in the lining (talk about leaky gut!), and causes death within a couple of days. It's especially effective on caterpillars.

In the 1990s, concern started to grow about the vast amount of insecticide being sprayed on corn, so clever scientists came up with a novel idea: implanting genes from the *Bt* toxin into the corn itself. The corn

FASCINATING FACTOID

Did you know that *Bt* is widely used in organic farming? The organic crowd loves it because it's a naturally occurring pesticide, and it's permitted in organic farming as an insecticide because it's a nonpathogenic bacteria that's naturally found in soil.

wouldn't require spraying because it was engineered to produce its very own *Bt* toxin the minute an insect bit into it.

Eighty-eight percent of all corn produced in the U.S. is genetically modified corn, and it is now regulated by the EPA under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). The EPA says, "*Bt* is completely harmless to humans and animals—it only affects insects."

But studies in the last few years have shown that to be far from the whole truth. A 2012 article in the *Journal of Applied Toxicology* found that far from being innocuous, the modified *Bt* insecticidal toxins that are produced by GMO plants are "not inert in human cells." What's more, the *Bt* proteins that are part and parcel of GMO crops are different from those naturally produced in the soil. "The effects of these modifications have not been addressed," writes Eva Sirinathsinghji, Ph.D., whose degree, incidentally, is in neurogenetics.

So great, the naturally occurring *Bt* toxin is natural and used in organic farming. Here's the problem: the *Bt* toxin that GMO plants produce is considerably more potent and different in nature than the *Bt* used in organic farming. The natural *Bt* sprayed on plants by organic farmers can be washed off by rain or by cleaning your produce in your sink. The *Bt* genetically engineered into the corn is eaten with every bite and can't be washed away.

CORN-DERIVED PRODUCTS YOU MAY WISH TO BUY ORGANIC ONLY

- cornstarch
- baking powder
- brown sugar
- cornmeal
- corn syrup
- tortillas
- corn chips
- polenta
- popcorn
- cereal
- whiskey
- sugar

Eva Sirinathsinghji, Ph.D., a scientist at the Institute for Science in Society, also points out that Bt toxin kills human kidney cells, causes infertility in rats, and, in one study, was found in the blood of 93 percent of pregnant women and in the blood of 80 percent of their babies. “These studies,” she says, “make it urgent that the health impact of Bt proteins in GM crops be thoroughly investigated.”

FAIR AND BALANCED?

In an attempt to give a fair hearing to the other side of the GMO argument, I Googled “GMO foods are safe,” figuring that there *must* be some really good studies showing their safety or the Food and Drug Administration (FDA) would never have permitted them into the food supply. I was extremely naive on that count.

The FDA actually requires no safety studies for GMO foods and leaves it up to the companies that produce it to confirm that they’re safe. That basically means that we have to rely on Monsanto’s reassurances that *their* studies show that these new GMO crops are perfectly safe and that the massive spraying of our crops with Roundup—and the insect-killing toxins in genetically modified corn—*pose absolutely no threat to humans*.

Good luck with that. It’s worth noting that Monsanto was the company that assured us that polychlorinated biphenyls (PCBs) were safe, DDT was safe, and that we had nothing at all to fear from Agent Orange. Just saying. Nonetheless, the issue of GMO safety is controversial and highly politicized, and you can still find government and industry apologists insisting GMO poses no health hazard of any kind.

No one I know believes them.

The push-back from the establishment was immediate. Monsanto’s response was to stick to its talking points. Scott Partridge, Monsanto’s vice president of global strategy, told CNN that “glyphosate is not

UPDATE: CALIFORNIA DECLARES GLYPHOSPHATE IS A CARCINOGEN

As this was going to press, the state of California declared that glyphosate is a carcinogen and that it falls under California Prop 65. In 1986, Prop 65 was enacted to help Californians make informed decisions about protecting themselves from known carcinogens or chemicals that cause reproductive harm.

According to CNN, the recent decision stemmed from an assessment by the International Agency for Research on Cancer that glyphosate is “probably carcinogenic to humans.”

carcinogenic, and the listing of glyphosate under Prop 65 is unwarranted on the basis of science and the law.”

Monsanto is expected to sue the state of California. Let the games begin.

As I continued to search for positive research on the safety of GMO foods I was almost always referred to one Jon Entine, who has the prestigious credential of being a senior research fellow at the Institute for Food and Agricultural Literacy at the University of California. Entine also writes the Contrarian column at *Forbes*. In his much-discussed article, “The Debate about GMO Safety is Over, Thanks to a New Trillion-Meal Study.” (Really? It is?) Entine says there are “more than 2,000” studies documenting that biotechnology does not pose an unusual threat to human health. He also says that genetically modified foods are “as safe or safer than conventional or organic foods.” Like establishment and

industry apologists everywhere, his tone is dismissive and condescending to those who question the safety of GMO foods.

But here's the thing: In the course of my career, I've run into more than a few of these so-called "debunkers of junk science." At first, they seem like the soul of scientific reasonableness. But, when you follow the money, their claim to scientific objectivity quickly becomes squishy. For example, in *The Great Cholesterol Myth*, Steve Sinatra and I point out that among the original nine members of the National Cholesterol Education Program panel charged with making new recommendations for cholesterol levels in 2004, eight of them had financial ties to the very drug companies that would reap immediate benefits from lowered cholesterol targets.

Remember that all of the major industries with an image to manage—think oil, pharmaceuticals, food—have millions of dollars to spend on marketing, and a big part of that marketing is making sure there are scientific studies to "support" the safety and efficacy of the products they sell. Part of their marketing budget is spent attempting to marginalize research—and researchers—who argue otherwise.

The Corn Refiners Association points to studies showing high-fructose corn syrup is harmless. Bread and cereal manufacturers find friendly journalists to write stories about how all this fear of gluten is

just trendy hype. The dairy industry spent countless millions fighting labels that would identify whether or not milk contained bovine growth hormone. Their argument was that "it doesn't make any difference and would just confuse the customer."

When companies can't "prove" the safety of their products, they take a page from the playbook of Big Tobacco and try to create questions about the validity of "the science" that shows their products to be damaging. Those of us who were around in the 1950s remember the lengths to which the tobacco lobby went to trumpet studies showing that cigarette smoking did not cause cancer. Did such studies exist? Sure. All you had to do was design a study on new smokers that lasted about three months. Almost no cancers would have shown up, and, if you were a cigarette manufacturer, you could now point to a scientific study showing that cigarettes don't cause cancer.

And not much has changed since then.

Today, companies that—by all scientific consensus—are operating in a way that is clearly increasing greenhouse gases and impacting global warming in a big way all have access to scientists who will argue that global warming is a hoax, or, at the very least, that it's not caused by man.

Back to Mr. Jon Entine.

Entine is supported by the American Council on Science and Health (ACSH), which describes itself as "a consumer education consortium concerned with issues related to food, nutrition, chemicals, pharmaceuticals, lifestyle, the environment and health." Sounds pretty noble, right? But according to SourceWatch—an arm of the nonprofit Center for Media and Democracy dedicated to exposing front groups, industry-funded organizations, and "PR spinners"—the ACSH is almost *wholly funded* by big agribusinesses and trade groups. SourceWatch points out that over the years, the ACSH has defended DDT, asbestos, Agent Orange, and many

For a wonderful education in how research can be used to support industry agendas, read David Michaels' *Doubt Is Their Product: How Industry's Assault on Science Threatens Your Health*.

common pesticides. The ACSH has actually referred to environmentalists and consumer groups as “terrorists,” saying that their criticisms and concerns about potential health risks in the food supply represent a threat to society. Ralph Nader calls ACSH “a consumer front organization for its business backers.”

So, sadly, it is becoming next to impossible for the consumer to get honest, unbiased information on GMO. In 1992, with enormous lobbying pressure from industry, the FDA issued a paper called “Guidance to industry for foods derived from new plant varieties,” published in the FDA Federal Register, Vol 57, Friday May 29, 1992. In it, they state that “the agency is *not aware of any information* showing that foods derived by these new methods differ in any meaningful or uniform way” from non-GMO crops, and that they had “no evidence” that “foods developed by the new techniques present any different or greater safety concern than foods developed by traditional plant breeding” (emphasis mine).

But the overwhelming consensus of scientists at the FDA was quite different from what their 1992 paper reported it was. Jeffrey Smith—Director of the Institute for Responsible Technology and the creator of the terrific documentary, *Genetic Roulette: The Gamble of Our Lives*—reports that the consensus among the scientists at the FDA was that GMO foods were *not* identical to conventional foods. The consensus at the FDA was actually that GMO foods were different and that they were inherently *dangerous* because they might create allergies, toxins, new diseases, and nutritional problems. FDA scientists had urged their superiors to require long-term study.

The FDA scientists made their opinions known, but when they later saw drafts of the policy statements that had been drafted they were angry and urged their political appointees to change course. “But the political appointees ignored the science,” says Smith, “and set

forth a policy that allowed GMOs to be put on the market in a way that creates unprecedented risk for human beings and the environment.”

In fact, in 1998, a lawsuit was filed by an almost unprecedented coalition of consumers, scientists, chefs, health professionals, and even religious leaders. The lawsuit forced 44,000 pages of FDA internal memos into the public domain. The suit was filed to demand safety testing of all genetically modified foods and mandatory labeling of such foods so that consumers could make informed choices about what they were eating and what they were feeding their families.

As Steven M. Druker, public interest attorney, initiator of the FDA lawsuit and author of *Altered Genes, Twisted Truth*, put it, “As I combed through those 44,000 pages of internal memoranda and other documents, I was shocked. Because it became clear that the FDA had been lying repeatedly since 1992. They claimed that there was an ‘overwhelming consensus’ in the scientific community that these foods were safe. But the overwhelming consensus within their own scientific staff was *exactly the opposite*. These foods could *not* have been presumed safe.”

As Rima Laibow, M.D., medical director of the Natural Solutions Foundation, puts it, “The FDA is composed of smart people. But they’re smart people with a conflict of interest. They are smart people who make their decisions based upon what will support their financial needs or their academic needs not what makes scientific sense.”

Further compounding the problem of getting honest, unbiased science is the phenomenon of the fox guarding the henhouse. The people regulating these things are often the same people who previously worked for the very companies they are regulating, and these folks move back and forth between government and industry with breathtaking regularity.

WHAT DOES “NON-GMO PROJECT VERIFIED” MEAN?

The Non-GMO Project is a nonprofit organization that offers third-party verification and labeling for non-GMO food and products.

If you see their “Non-GMO Project Verified” seal on a food product, it means that the product has gone through an extensive verification process. The project has rigorous standards, which includes ongoing testing of all at-risk ingredients.

While some products may say “GMO-Free” on the label, that claim is not legally nor scientifically defensible due to limits on testing methodology and risks of contamination. The Non-GMO Project Verified seal represents the best available guarantee that a product is truly free of GMOs. It’s not totally infallible, but it’s the best standard we currently have.

Indeed, a cursory look at the appointees throughout the first Bush administration, the Clinton administration, the second Bush administration, and even the Obama administration reveals a host of appointees and FDA officials who previously worked for Monsanto. Critics point to the case of Michael Taylor, who went from being an attorney for the FDA to an attorney for Monsanto and bounced back and forth between the two from 1976 to 2010. When President Obama appointed him food safety czar, it engendered op-ed pieces like the one in *Huffington Post* entitled, “You’re Appointing Who? Please Obama, Say It’s Not So.” With foxes like this guarding the henhouse, activists can be forgiven for wondering if the playing field is in fact a level one.

SO WHAT CAN YOU DO?

It’s a good question, and there aren’t easy answers. You can start by doing your own investigation, starting with some of the research quoted in this article. Read everything you can, watch the documentaries, listen to both sides, and see what you think. Maybe you’ll come to a very different conclusion than I’ve come to. Maybe you’ll think that all this worry about GMO is for nothing. Or maybe you’ll become so angry that you yourself will become an activist.

Genetically modified food seems to be a fact of life that we won’t be able to change in the near future. Each of us will have to deal with the uncertainty in our own way. But make no mistake—despite what industry sources continue to say, it is uncertainty that we’re dealing with. No one really knows what the long-term results of the GMO experiment will be. Personally, I’ve completely cut out soybeans and corn unless they’re organic, and I try whenever possible to buy food that is only non-GMO certified. And I’ll vote for mandatory labeling every time it makes its way to the ballot.

Mandatory labeling seems like it should be a no-brainer. A strong majority of Americans favor labeling of GMO foods, a practice that has been mandatory in Europe since their introduction into the food supply. “The Europeans offer a very different perspective from the one adopted by American authorities,” writes Michael Lipsky, a Distinguished Senior Fellow at Demos, a research and policy think tank in the U.S. “The Europeans take what has been called the ‘precautionary’ approach, an approach that strongly resembles American views on licensing new drugs and medical treatments.”

Indeed, as *Washington Post* reporter Michael Birnbaum has said, “U.S. regulators tend to rely on short-term scientific studies about safety to give new

technologies a green light. European regulators tend to be far more cautious, focusing more on what they might not know than on what they do know.”

According to the *New York Times*, as many as 92 percent of Americans do in fact want laws that require GMO foods to be truthfully labeled, allowing consumers to actually know what they’re buying. At the very least, this seems fair. Consumers would not unknowingly be purchasing GMO products and would be able to make informed decisions about what they’re feeding their families.

Good luck with that.

In my own state, health-minded California, Monsanto and its allies reportedly spent 45 million dollars blanketing the airwaves with ads that managed to convince a majority of voters that labeling GMO foods would accomplish absolutely nothing except to make their food more expensive. California’s Prop 37 (mandatory labeling for GMO foods) was roundly defeated. Some thirty states have floated propositions at one time or another that would require mandatory GMO labeling, and the vast majority of them were defeated. It’s important to remember that the campaign to defeat these bills is being largely funded by one of the biggest agribusiness companies in the world. According to the nonprofit Environmental Working Group, Big Food, biotechnology, and trade associations spent 101.4 million dollars on lobbying in 2015 alone, just working to prevent GMO labeling.

Then, in 2016, it looked like things were going to change for the better.

In 2016, Congress approved a bill that essentially confirmed the consumer’s right to know whether or not their food was GMO. The bill covered some 25,000 more food packages than state labeling laws covered, and it required that those food products carry information that indicated whether the food contained GMO ingredients or not. The bill—S. 764—was signed by President Obama on July 29, 2016.

But it made no one happy. While the bill required foods to indicate whether they were GMO or not, a loophole compromise allowed manufacturers to use a QR code or an 800 number to convey this info, making it particularly difficult or time consuming for consumers to actually get the info they were entitled to. These “alternative” labels make it particularly hard for low-income people with limited access to smartphones and scanning apps to actually *get* the information to which Congress had confirmed they had a right.

In any case, all of it may now be moot. As of this writing (July 2017), there’s a bill being debated in the Senate that may well demolish the bill Obama signed before it even gets implemented. The bill is known as the Regulatory Accountability Act, or RAA, and according to Colin O’Neil, the Agriculture Policy Director of the Environmental Working Group, it “would require an endless loop of studies, court reviews and congressional approvals before departments like the USDA could adopt new rules.” If the current bill passes, the mandatory labeling law that Obama signed in 2016—weak as it is—will never see the light of day, and you will never really know whether the salmon on your plate once swam in the pristine waters of Alaska or was genetically engineered in a lab.

**THE NON-GMO PROJECT
LISTS THE FOLLOWING CROPS
IN COMMERCIAL PRODUCTION
AS “HIGH RISK”**

- alfalfa
- canola
- corn
- papaya (most of Hawaiian crop)
- soy
- sugar beets
- zucchini and yellow summer squash

SOY-BASED FOODS YOU MAY WISH TO BUY ORGANIC ONLY

- edamame
- tofu
- tempeh
- tamari
- soy nuts
- soy sauce
- soy flour
- soy protein powder
- veggie hotdogs or burgers
- some processed deli meats
- miso
- soy cheese
- soy mayonnaise
- soy milk

SO WHAT'S THE TAKE-AWAY?

The campaign to sell us GMO foods is built on one simple notion: *there is no real difference between a “natural” (non-GMO) food and its genetically modified equivalent.* This is a familiar tactic, frequently used by Big Food lobbyists. The dairy industry spent millions battling the “No Bovine Growth Hormone” labels on milk arguing that it would confuse consumers into thinking that bovine growth hormone was a bad thing.

Yes. They seriously said that.

And there have been industry-funded studies “proving” that organically grown plants have no advantage over their conventionally grown brethren. But take these studies with a grain of salt. If I have a barrel of apples that have been poisoned and a barrel of apples that are perfectly good, designing a study to “prove” these two barrels of apples are essentially the same is child’s play. All you do is pick variables to study that don’t matter, for example, “redness”, “roundness” and “weight.” The next thing you know you’ve got an

industry-sponsored study of poisoned and un-poisoned apples that concludes, “we were unable to find any statistically significant differences between the two barrels of apples on *any measure studied.*”

And they wouldn’t be lying. They just chose variables to study (like roundness) that were irrelevant. Big Food does this all the time when they fund studies that show that organic food is “no different” than non-organic food. They won’t look at differences in pesticide content—they’ll look at differences in, say, vitamin C. If you’re only looking at vitamin content then it may well be that organic and non-organic versions of a food are pretty similar nutritionally.

But that hardly makes them identical.

The advantage of organic, non-GMO food is not in what it contains. The advantage of organic, non-GMO food is what it *doesn’t* contain: compounds that have, until now, never been seen on the planet, let alone been part of the human diet.

And to me, that’s a pretty big advantage.

Long-term effects

Whenever you study a subject where accurate, long-term info is hard to come by, you have to do a certain amount of guesswork, of connecting the dots and drawing conclusions—albeit tentative ones. We know, for example, that an unhealthy microbiome has a tremendous effect on a host of conditions from depression to obesity. We also know that the long-term effects of genetically modified foods on the microbiome is wholly unknown. Those dots connect in a way that argues for extreme caution.

We know that the prevalence of autoimmune diseases is exploding, and that autoimmune diseases can be triggered by all kinds of toxins and unfamiliar molecules. We also know that GMO foods, by definition, are filled with unfamiliar molecules. Can GMO foods trigger autoimmune disease? Who knows? But the dots connect in a way that argues for extreme caution.

Indeed, the long-term effects of genetically modified foods on the health of humanity in general is anyone's guess.

What *is* known is the basic, founding principle of medicine: "First, do no harm." We can't prove beyond any doubt whatsoever that GMO foods are not a good thing for human beings, but we sure have a lot of connect-the-dots reasons to suspect that they aren't.

Which is why I vote for erring on the side of caution.

The research may not yet be definitive, and the "evidence" may be circumstantial, but I for one would prefer to opt out of what may well be the biggest—and perhaps most dangerous—nutritional experiment in history. •

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About the Author



Jonny Bowden, Ph.D., CNS, also known as “The Nutrition Myth Buster”™ is a nationally known board-certified nutritionist and expert on diet and weight loss. He has been interviewed on television more than one hundred times—including appearances on the Dr. Oz Show, Fox News, CNN, MSNBC, ABC, NBC, and CBS—and has written (or been interviewed for) articles in the *New York Times*, *Forbes*, the *Daily Beast*, the *Huffington Post*, *Vanity Fair* online, *Men’s Heath*, *O* (the Oprah Magazine), *People*, *Prevention*, and dozens of other print and online publications.

Dr. Jonny is the best-selling author of fifteen books, including *The 150 Healthiest Foods on Earth*, *Living Low Carb* (now in its fourth edition) and the controversial number-one Amazon best-seller, *The Great Cholesterol Myth* (co-authored with cardiologist Stephen Sinatra, M.D.). His recent book, *Smart Fat*, was co-authored with PBS star Steven Masley, M.D. He has lectured to standing-room-only audiences all over the world, including at Beijing University in China, after which he was elected to honorary membership in the DeTao Masters Academy, an international group of 125 thought leaders headquartered in Shanghai.

Dr. Jonny is a columnist for *Clean Eating* magazine, *Better Nutrition*, *Amazing Wellness*, and *Whole Foods* online, and has served on the scientific advisory board for multiple companies in the natural products industry. He was featured in the Australian Broadcasting Network’s television documentary *Heart of the Matter*, and is a much in-demand speaker who’s presented at both academic conferences and consumer events all over the world, including Paleo f(x), Bulletproof Conference, American Academy for Anti-Aging Medicine (A4M), Vitamin Shoppe Conference, Low-Carb USA, and the American College of Nutrition.

To find out how you or your company can work with Dr. Jonny, visit: www.jonnybowden.com

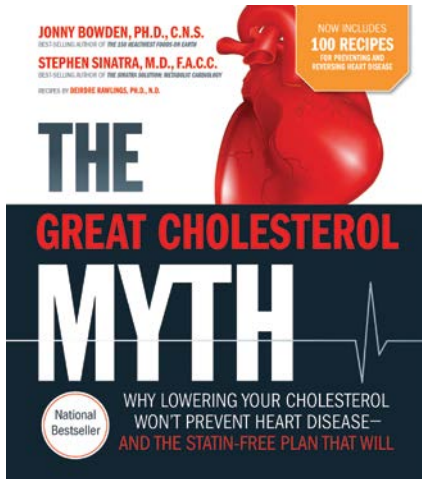


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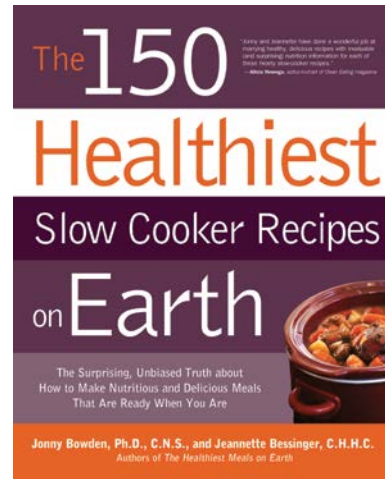


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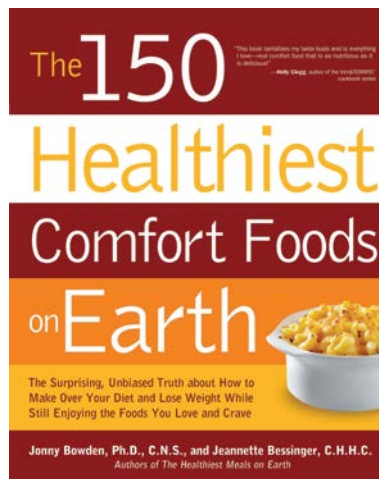
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