

# The Ultimate Guide to GMOs:

Discovering the Myths and Truths About  
Genetically Modified Organisms



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## Open Your Eyes to the Truth About GMOs

If you're a very stringent shopper, or if you are very careful about choosing the types of food you feed to your family, then you've probably come across the term "GMO" – genetically modified organisms. Chances are you've seen labels of foods with the caption "GMO-Free" or "No GMOs." Or you might have seen news reports about GMO labeling initiatives in different states around the country.

But what exactly are GMOs? Where do they come from, and what are they doing in our food supply?



In a nutshell, GMOs are a product of genetic engineering, meaning their genetic makeup has been altered to induce a variety of "unique" traits to crops, such as making them drought-resistant or giving them "more nutrients." Currently, up to 85 percent of U.S. corn, 91 percent of soybeans, and 88 percent of cotton are genetically modified. It is also estimated that at least 80 percent of processed foods now contain genetically engineered ingredients.

GMO proponents claim that genetic engineering is "safe and beneficial," and that it advances the agricultural industry. They also say that GMOs help ensure the global food supply and sustainability.

But is there any truth to these claims? I believe not.

For years, I've stated the belief that GMOs pose one of the greatest threats to life on the planet. Genetic engineering is NOT the safe and beneficial technology that it is touted to be.

I would like to share with you the real story behind genetic engineering, which is why I created this e-book, *The Ultimate Guide to GMOs*. Here, you will:

- Learn the history of GMOs and how the practice of genetic engineering started
- Discover which crops and "supermarket fares" are commonly genetically engineered today
- The myths and truths about GMOs – and its potentially damaging effects on the economy, the environment, and your health
- The importance of GMO labeling – and why big biotech companies are strongly opposing it

I believe this is your best resource if you want to know more about GMOs. If you truly value your and your family's health, I suggest you read this now – it will help educate you on the reality that is genetic engineering and why you should be wary of GMOs at all times.

## Chapter I:

# What Are GMOs?

Genetically modified organisms (GMOs) are live organisms whose genetic components have been artificially manipulated in a laboratory setting through creating unstable combinations of plant, animal, bacteria, and even viral genes that do not occur in nature or through traditional crossbreeding methods.<sup>1</sup>

The biggest use of GMO technology has been on large-scale agricultural crops. In an effort to prevent and control pests, crops are genetically engineered to either:

1. **Produce pesticide within their own tissues** – Monsanto's Bt corn is equipped with a gene from the soil bacteria *Bacillus thuringiensis* (Bt), which produces Bt toxin—a pesticide that breaks open the stomach of certain insects and kills them. This pesticide-producing GM corn entered the food supply in the late 1990s, but it wasn't until 2003 that the Bt corn that kills Western corn rootworm was commercialized in Illinois.



Corn rootworm is one of the most devastating pests to corn crops, and it has historically been managed in conventional farming by crop rotation and the use of insecticides applied to the soil. With Bt corn, the use of such insecticides was supposed to be curbed. But 10 years later, to everyone's dismay, the pests are already developing resistance to the GM corn and other serious consequences are being uncovered.

2. **Be herbicide- and/or pesticide-resistant** – About 85 percent of all GMO plants are herbicide-tolerant or genetically engineered to withstand direct application of glyphosate, the active ingredient in Monsanto's potent herbicide Roundup. These are the so-called Roundup Ready crops.

Because of the massive production of GMO crops in developing countries, the use of glyphosate, touted as the world's most-used herbicide, has continuously risen throughout the years. According to the US Geological Survey Office (USGS) more than 88,000 tons of glyphosate were used in the United States alone in 2007, up from 11,000 tons in 1992.<sup>2</sup>

The biotech industry also claims that GMO crops can be engineered for disease resistance, drought tolerance, nutrient improvement, and yield increase. Unfortunately, there's still no evidence to back up these claims or even the very safety of GMO crops.

What is clearly established, though, is that after being heavily doused with toxic chemical herbicides and/or pesticides, GMO crops become less nutrient-dense compared to their organic, non-GMO counterparts, and in addition to having alarming amounts of potentially health-damaging [pesticide residues](#), also come with novel allergenic proteins.

Dr. Stephanie Seneff, a senior research scientist at Massachusetts Institute of Technology (MIT) who has done extensive studies on this topic, believes glyphosate is one of the key culprits in the development of multiple chronic diseases and conditions that have become prevalent in Westernized societies, including:

Autism	Gastrointestinal diseases such as inflammatory bowel disease (IBD), chronic diarrhea, colitis, celiac disease, and Crohn's disease
A wide range of allergies	Infertility
Cancer	Alzheimer's disease
Parkinson's disease	Multiple sclerosis (MS)

## How Are GMOs Made?

A genetically modified organism is the product of the extraction of genes from the DNA of one species, which is then artificially forced into the gene of an unrelated plant or animal. Since the process involves the transfer of foreign genes, GMOs may also be referred to as transgenic organisms.

Although the first step in genetically engineering plants – the process of cutting and splicing genes in the test tube – is precise, the subsequent steps are not. In particular, the process of inserting a genetically modified gene into the DNA of a plant cell is crude, uncontrolled, and causes mutations (heritable changes) in the plant's DNA blueprint.<sup>3</sup>

All living organisms have natural barriers to shield themselves against the introduction of DNA from an entirely different species, which is why genetic engineers come up with various novel ways to make this possible, such as:<sup>4</sup>

- Using viruses or bacteria to "infect" animal or plant cells with the new DNA
- Coating DNA onto tiny metal pellets, and firing it with a special gun into the cells
- Injecting the new DNA into fertilized eggs with a very fine needle
- Using electric shocks to create holes in the membrane covering sperm, and then forcing the new DNA into the sperm through these holes



Despite the countless safety guarantees we hear from GMO proponents, it's important to note that this technology is still at its rudimentary stages. Mounting studies have ceaselessly shown that it's impossible to insert a foreign gene into an organism accurately without causing any harm or disruption in the finely controlled network of DNA inside it. A single alteration at the DNA level can lead to multiple mutations within the organism. And these mutations can alter the functioning of the natural genes of the plant in unpredictable and potentially harmful ways.<sup>5,6</sup>

## Brief History of GMOs: How Did Genetic Engineering Start?

With the irrefutable prevalence of genetic engineering in our society today, one could only wonder how and when all of this began, and how we had gotten to this point where everything seems to be out of hand.

Genetic engineering goes a long way back in history, dating as far back as the times of Charles Darwin and Gregor Mendel when gene modification and selective breeding were only becoming known to man. To better understand how GMOs specifically got into our food supply, here's a comprehensive GMO timeline:<sup>7,8</sup>

- **1935 – DNA Discovered**  
Russian scientist Andrei Nikolaevitch Belozersky isolates pure DNA.
- **1973 – Recombinant DNA Created**  
The idea for man-made DNA, or rDNA, comes from a grad student at Stanford University Medical School. Professor Herbert Boyer and a few of his biologist colleagues run with it.
- **1975 – Asilomar Conference**  
A group of biologists get together with a few lawyers and doctors to create guidelines for the safe use of genetically engineered DNA.
- **1980 – First GMO Patent Issued**  
A 1980 court case between a genetic engineer at General Electric and the U.S. Patent Office is settled by a 5-to-4 Supreme Court ruling, allowing for the first patent on a living organism. The GMO in question is a bacterium with an appetite for crude oil, ready to gobble up spills.
- **1982 – FDA Approves First GMO**  
Humulin, insulin produced by genetically engineered E. coli bacteria, appears on the market.
- **1983 – GM Plants Created**  
Four separate groups of scientists create GM plants: three groups insert bacterial genes into plants and one inserts a bean gene into a sunflower plant.

- **1988 First Transgenic Plant Producing a Pharmaceutical**

The transgenic maize (corn) is produced.

- **Late 1980s to Early 1990s – GM Crops Sold in China**

China puts GM crops on sale, namely virus-resistant tobacco and tomato.

- **1990 – GM Hard Cheese–**

GM is used to make chymosin, an enzyme used in making hard cheese.

- **1993 – FDA Approved Growth Hormone in Dairy Cows**

The US Food and Drug Administration (FDA) approves Bovine somatotropin (bST), a metabolic protein hormone used to increase milk production, in dairy cows for commercial use.

- **1994 – GMO Hits Grocery Stores**

The U.S. Food and Drug Administration (FDA) approves the Flavr Savr tomato for sale on grocery store shelves. The delayed-ripening tomato has a longer shelf life than conventional tomatoes.

- **1995 – Introduction of Bt Potatoes and Corn, and Roundup Ready Soybeans**

Bt potato is approved safe by the Environmental Protection Agency (EPA), making it the first pesticide-producing crop to be approved in the USA. Bt corn and Roundup Ready soybeans are released in the US market the same year.

- **1996 – Spread of GMO-Resistant Weeds**

Weeds resistant to glyphosate, the herbicide used with many GMO crops, are detected in Australia. Research shows that the super weeds are seven to 11 times more resistant to glyphosate than the standard susceptible population.

- **1996 – Dolly, the First Cloned Animal, Was Born**

The birth of the first cloned animal, Dolly the sheep, is announced.

- **1997 – Mandatory Labels**

The European Union rules in favor of mandatory labeling on all GMO food products, including animal feed.

- **1999 – GMO Food Crops Dominate**

Over 100 million acres worldwide are planted with genetically engineered seeds. The marketplace begins embracing GMO technology at an alarming rate.

- **2003 – GMO-Resistant Pests**

In 2003, a Bt-toxin-resistant caterpillar-cum-moth, *Helicoverpa zea*, is found feasting on GMO Bt



cotton crops in the southern United States. In less than a decade, the bugs have adapted to the genetically engineered toxin produced by the modified plants.

- **2006 –Omega-3-Producing GM Pig**

A pig is engineered to produce [omega-3](#) fatty acids through the insertion of a roundworm gene.

- **2011– Bt Toxin in Humans**

Research in Eastern Quebec finds Bt toxins in the blood of pregnant women and shows evidence that the toxin is passed to fetuses.

- **2012 – Farmer Wins Court Battle**

French farmer Paul Francois sues Monsanto for chemical poisoning he claims was caused by its pesticide Lasso, part of the Roundup Ready line of products. Francois wins and sets a new precedent for future cases.

- **2014 – GMO Patent Expires**

Monsanto’s patent on the Roundup Ready line of genetically engineered seeds will end in two years. In 2009, Monsanto introduced Roundup 2 with a new patent set to make the first-generation seed obsolete.

## The Rise of Monsanto and Other Biotech Companies

The biggest proponents of GMOs are none other than the same multibillion corporations who own majority of the world’s seed, pesticide, and biotech industries, also known as “The Big 6.” These include:<sup>9</sup>

1. **Monsanto**, considered the mother of agricultural biotechnology. [Monsanto](#) is most known for producing GM seeds to tolerate its flagship herbicide, Roundup, and for introducing other notorious products such as Agent Orange, dichlorodiphenyltrichloroethane (DDT), recombinant bovine growth hormone (rBGH), and aspartame.<sup>10</sup>
2. **BASF** is the North American subsidiary of the world’s largest chemical company, BASF SE, based in Ludwigshafen, Germany. BASF used its massive influence in 2008 in order to run GM crop trials, featuring blight-resistant potatoes, in the UK despite public protest.<sup>11</sup>

3. **Bayer** is a global holding company for a number of pharmaceutical, biotechnology, agrochemicals, healthcare, plastics, and other materials subsidiaries. Bayer has ties to the American Legislative Exchange Council (ALEC), a corporate bill mill, and has been on its private enterprise board.<sup>12</sup>



In 2012, two studies published in the journal *Science* suggested a particularly strong connection between the use of a class of pesticides called neonicotinoids and the decline of both bumblebee and honeybee populations, which Bayer have lobbied strongly against. Bayer manufactures imidacloprid and clothianidin, which are known neonicotinoids.<sup>13</sup>

4. **DuPont** is originally known to be the main supplier of gun powder for the US during World War II, and rose to becoming the largest seed company and producer of hybrid seeds used in production of GE corn and soy in 1999. Like Monsanto, DuPont is also infamous for its revolving doors within the government.<sup>14</sup>
5. **Dow Chemical Co.** won US approval in 2014 for its Enlist Duo weed killer, a combination of the herbicides 2,4-D and glyphosate, clearing the way for sales of corn and soybeans genetically engineered to tolerate the herbicide. The said approval will increase use of 2,4-D by two- to sevenfold, reaching as much as 176 million pounds in 2020, the Center for Food Safety said in an e-mailed statement, citing U.S. Department of Agriculture estimates.<sup>15</sup>
6. **Syngenta** faced over 50 lawsuits by US farmers in 2014 after traits of its GM corn seed Agrisure Viptera were found in US shipments to China, which the latter neither tested nor approved for import. Between February and October 2014, China rejected over 130 million bushels of US corn, contributing to an 85 percent drop in US corn exports. The loss of Chinese corn sales depressed the US market and drove down domestic corn prices, according to a number of the lawsuits.<sup>16</sup>

With all their big guns combined, these biotech giants have the fate and future of farming in their own hands. Their historically unparalleled power over world agriculture enables them to control the agricultural research agenda; dictate trade agreements and agricultural policies; position their technologies as the “science-based” solution to increase crop yields, “feed the hungry,” and “save the planet;” escape democratic and regulatory controls, and subvert competitive markets.<sup>17</sup>

## Note: Genetic Engineering Is NOT an Extension of Natural Plant Propagation



The industry has led us to believe that genetic engineering is a mere extension of the natural breeding process. But nothing could be further from the truth.

In nature, breeding can only happen between related species. For example, cats with cats or dogs with dogs, not cats with dogs or tomatoes with fish. But it's an entirely different story with [genetic modification](#), where genetic engineers play around with foreign DNAs, extracting and inserting them into a totally different species. These unpredictable alterations in the DNA, proteins, and biochemical composition frequently result in unexpected toxic or allergenic effects and nutritional instabilities.

## Chapter II:

### What Is a Genetically Modified Food?

Any edible plant or animal material whose genetic components have been artificially tweaked or altered in a laboratory setting is considered a genetically modified food. Likewise, any food product that contains one or more genetically modified ingredients is a GM food.

### What Kinds of GE Crops Are Currently Being Planted?

In 1996, biotech giant Monsanto introduced US farmers to Roundup-ready soybeans, which are genetically designed to be resistant to [glyphosate](#), the active ingredient to their very own weed-killing herbicide. Fifteen years later, GMO crops have now invaded virtually every acreage in the country, making it more and more difficult for farmers to grow non-GMO crops since contamination has become a big problem.<sup>18</sup>

Currently, three major cash crops make up the bulk of the GMO acreage in the United States, namely corn, cotton, and soybeans. In fact, US farmers planted 169 million acres of these GMO crops in 2013 alone, about half of the total land used in growing crops. They planted herbicide-tolerant varieties, which accounted for 93 percent of soybean acreage, 85 percent of corn acreage, and 82 percent of cotton acreage.<sup>19</sup>

Here are other registered genetically modified crops to watch out for:<sup>20</sup>

CROP NAME	SCIENTIFIC NAME	TRADE NAME
Alfalfa	<i>Medicago sativa</i>	Roundup Ready™
Apples	<i>Malus x Domestica</i>	Arctic Golden Delicious and Granny Smith
Argentine Canola	<i>Brassica napus</i>	Laurical™, Optimum® Gly, and Roundup Ready™
Sugar Beet	<i>Beta vulgaris</i>	InVigor™, Liberty Link™, and Roundup Ready™
Tomato	<i>Lycopersicon esculentum</i>	FLAVR SAVR™
Potato	<i>Solanum tuberosum L.</i>	Lugovskoi plus, Superior NewLeaf™, and Innate™
Papaya	<i>Carica papaya</i>	Rainbow and SunUp

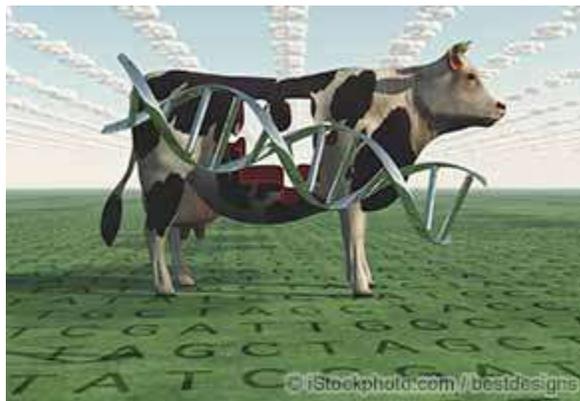
Be a savvy reader of food labels and be sure to steer clear from food ingredients derived from these GMO crops, including:

- Corn flour, corn gluten, corn masa, maize, corn starch, corn syrup, corn meal, and high-fructose corn syrup (HFCS)
- Soy flour, soy lecithin, soy protein, soy isolate, and soy isoflavone
- Processed vegetable oils like canola oil, rapeseed oil, and [cottonseed oil](#)

When shopping, you should also make it a habit to look for products with the “Non-GMO Project Verified” seal, which indicates that it has gone through Non-GMO Project’s verification process. The Non-GMO Project is a non-profit organization that does third-party verification and labeling for non-GMO food and products.

### **Monsanto’s Mischief: Milk and Dairy Products Laced with rBGH**

The biotech industry’s GMO invasion did not stop with food crops. Amidst protests from physicians, scientists, and advocacy groups, the US FDA approved Monsanto’s genetically engineered recombinant bovine growth hormone (rBGH) to be injected into cows to increase milk production.



rBGH is a synthetic version of natural bovine somatotropin (BST), a hormone produced in cows' pituitary glands. Monsanto developed the recombinant version from genetically engineered *E. coli* bacteria and markets it under the brand name Posilac.

It is presently banned in more than 30 countries around the world, except the United States, because of its dangers to human health, which include an increased risk for colorectal, prostate, and breast cancer by promoting conversion of normal tissue cells into cancerous ones. Despite decades of solid evidence about the health hazards of rBGH, the FDA still maintains that it's safe for human consumption, snubbing the glaring scientific data that says otherwise.

In 1999, the United Nations Safety Agency decided unanimously not to endorse or set safety standards for rBGH milk, which successfully led to an international ban on US milk.

To protect you and your family from the possible health consequences of this toxic chemical, look for “rBGH-FREE” labels when buying milk, or better yet, ask your trusted local organic farmer on how to avail of fresh raw milk from his pasture-raised, hormone-free cows.

## Chapter III:

# Myths and Truths About GMOs

Equipped with an armada of marketing and PR specialists and the unwitting support from the mass media, the biotech industry, led by Monsanto and other multibillion agribusinesses like Cargill, Syngenta, and Bayer, has effectively promulgated one too many lies about GMOs. Let's dig deeper into this issue to separate the fakes from the facts about GMOs.

### Myth: GMOs Will Save Us from World Hunger

Microsoft founder Bill Gates is a staunch believer that GMOs are the solution to worldwide hunger. Well, wouldn't you be, too, if you're a major Monsanto shareholder with 500,000 shares?

It is difficult to imagine how GMOs can solve world hunger when rising evidence continuously shows that GM farming practices are unsustainable, almost assuring us of future crop failures and subsequent famine.

The International Assessment of Agricultural Knowledge, Science, and Technology for Development (IAASTD) team of 400 international experts, funded by major international organizations like the World Bank and the United Nations, found that GM seeds were outperformed by agroecological farming methods, which they concluded to be the key to food security.<sup>21</sup>

Conventional plant breeding has delivered what the biotech industry's novel technology has been promising farmers – crops that are high-yielding, disease- and pest-resistant, tolerant of drought and other climatic extremes, and nutritionally enhanced – at a fraction of the cost.<sup>22</sup>

It's also crucial to note that the main reason for hunger is not lack of food at all, but a lack of access to it. In fact, the UN Food and Agriculture Organization believes we already produce more than enough food to feed the world's population and could produce enough with existing agricultural methods to feed 12 billion people.<sup>23</sup>

### Truth: Genetic Engineering Is an Energy-Hungry Technology

A data from Argentina, which compared the energy used in growing genetically modified Roundup Ready soybeans versus naturally bred soybeans, showed that Roundup Ready soybeans require more energy, regardless if they used no-till or tillage systems, due to the massive amounts of energy consumed in the production of herbicides used.<sup>24</sup>



Sustainable organic farming systems, on the contrary, use only a mere 63 percent of the energy required by chemical-based farming systems, in large part because they eliminate the energy required to produce nitrogen fertilizer and pesticides.<sup>25</sup>

## Myth: GMOs Increase Yield Potential

GM proponents frequently boast of genetically engineered crops' ability to produce higher and better yields compared to non-genetically engineered varieties, although there is yet any credible evidence to substantiate this claim. On the contrary, mounting papers reveal the opposite about this claim.

Controlled field trials comparing GM and non-GM soy production suggested that 50 percent of the decrease in yield is mainly due to the gene disruption caused by the genetic manipulation process.<sup>26</sup> Likewise, field tests of Bt maize hybrids showed that it took them longer to fully mature and produced up to 12 percent lower yields than their non-GM counterparts.<sup>27</sup>

In his paper "Failure to Yield," Dr. Doug Gurian-Sherman, former biotech adviser to the US Environmental Protection Agency (EPA) and senior scientist at the Union of Concerned Scientists in Washington, DC, concluded that:

*"Commercial GE crops have made no inroads so far into raising the intrinsic or potential yield of any crop. By contrast, traditional breeding has been spectacularly successful in this regard; it can be solely credited with the intrinsic yield increases in the United States and other parts of the world that characterized the agriculture of the twentieth century."<sup>28</sup>*

## Truth: Herbicide Use Has Skyrocketed Due to Genetic Engineering

One of the greatest promises of GM crops is the reduction in pesticide and herbicide requirement, an utterly preposterous claim when you think about it. Genetically modified crops have been explicitly designed by biotech corporations to specifically tolerate and depend upon the very herbicides they sell and market to farmers. For example, Monsanto's Roundup Ready crops, particularly soy, have caused a significant surge in glyphosate use worldwide.



A report by agronomist Dr. Charles Benbrook using official US Department of Agriculture data found that:<sup>29</sup>

- Crop years 2007 and 2008 accounted for 46 percent of the increase in herbicide use over thirteen years across the three herbicide-tolerant crops. Herbicide use on GM herbicide-tolerant crops rose 31.4 percent from 2007 to 2008.

- Herbicide-tolerant maize, soy, and cotton caused farmers to spray 383 million more pounds (174 million kilograms) of herbicides than they would have done in the absence of herbicide-tolerant seeds.
- Farmers applied 318 million more pounds of pesticides as a result of planting genetically engineered seeds over the first 13 years of commercial use.

Benbrook later identified the spread of glyphosate-resistant weeds as the root cause of this immense herbicide increase.

In the next chapter, you will discover more about glyphosate's devastating effects to your health and the environment.

## Chapter IV:

# The Damaging Effects of Genetic Engineering

GMOs brought only one positive impact, which is increasing the profit of biotech companies responsible for its mass production. Now, years after its commercial and worldwide use, its adverse effects on our health and environment are unfolding...

## Environmental Effects of GMOs

Pro-GMOs said that GE seeds were safe to grow but it is only now that we get to see the potential damage that it may cause on our ecosystem.

### GMOs Promote Monoculture

Traditionally, farmers practiced polyculture, or the planting of different crops on a rotational basis, because it sustained the nutritional needs of the community. But when Monsanto introduced genetically modified seeds in mid-1990s,<sup>30</sup> a lot of farmers supported it. GE proponents promised high resistance to pesticides and herbicides, especially glyphosate, without sustaining any damage, and increased yields in crops.

This resulted in monoculture, which is the planting of just one variety of crops in a farmland. Most farmers practice this technique on GE corn, soybeans, wheat, and sometimes, rice.

Sadly, the promise of increased in yields was not met. In addition, “superweeds”<sup>31</sup> started infesting vast farms in the U.S., resulting in a massive loss of crops amounting to one billion dollars – a huge loss for farmers. The weeds have formed a resistance against the herbicides and pesticides, specifically [Monsanto’s Roundup herbicide](#).

What’s more, monoculture has led to staggering effects on our agriculture and environment:

- Farmers are forced to use more toxic and more harmful pesticides and herbicides against pests and weeds, which in turn form resistance against these chemicals. This requires agribusiness companies to produce more toxic pesticides, resulting in a never-ending cycle.
- It damages the soil through the depletion and reduction of the diversity of soil nutrients.
- It makes crops vulnerable to different parasitic species.
- Crops become highly dependent on chemical pesticides, fertilizers, and antibiotics.
- It destroys biodiversity and heavily relies on costly farm equipment and machinery, which require maximum use of fossil fuels.

Aside from farms, there have been reports about the immense loss of bees and other insects in the U.S., which may have resulted from the proliferation of GE crops.

## Death of Bees and Monarch Butterflies Blamed on GMOs

Most of you may not be familiar with the phenomenon called Colony Collapse Disorder (CCD), which is the massive loss of bees around the world. In the U.S., 50 to 90 percent of the bee population has already been lost.



Most people would probably think, “It’s just bees,” but it’s not that simple. Bees are actually important in the agricultural industry because they help in the pollination of different fruits and vegetables.

In 2013, there was a massive loss in the bee population. In California, where there are 800,000 acres of almond orchards, thousands of hives were needed for pollination, but the orchard owners could not find enough bees. Beekeeper John Miller brought 11,000 hives, but hundreds of them were dead.

One of the possible reasons is the use of insecticides known as neonicotinoids. This toxic chemical, commonly used in most crops in the U.S., can be acquired by bees from the nectar and pollen of the crops, as it’s sprayed to the seeds even before they are planted.

To make matters worse, horizontal gene transfer occurs between the insect and the plant. In a German study conducted in 2000,<sup>32</sup> it showed that when the adult bees fed the younger ones with the pollen of the GE crop, the same gut bacteria were found in the younger bees and the GE crop. During horizontal gene transfer, the gene of one species is injected into a different species, far from its kind. This can lead to unpredictable and unexpected results unlike when vertical gene transfer happens through asexual or sexual reproduction.

There has also been a massive loss of monarch butterflies because of the increasing use of GMOs in many farms. Before, milkweed, a plant that is the primary source of food of monarch caterpillars, is commonly found in farms. Now these are replaced with GMO crops. Not only that, milkweed is also killed by the glyphosate in the Roundup pesticide.

## GMOs Also Affect Conventional Crops

Farmers now choose to plant GE seeds, which limits the choices in our food supply. Biotech companies produce GE soy and corn seeds, which make up most of our farmlands today.

Farmers prefer planting these kinds of crops because they are resistant to herbicides and pesticides, especially to glyphosate, which is the main component of Roundup. The farmers are now forced to apply Roundup in large quantities resulting in the reduction of all beneficial organisms in the soil.

Organic farming is being slowly phased out – a move that I strongly condemn. What we need the most today are organic foods that are free of chemicals, which are necessary for us to live a healthy life. If GE crops will continue to dominate the food cycle, it will surely have a negative impact on your health.

## How Are GMOs Harming Your Health?

Producers of GMOs said that genetically engineered crops are safe to eat, but food regulators such as the Food and Drug Administration (FDA) do not conduct any test on the safety of these foods on human health. They say that these tests are too expensive and would require years of observation to determine if there is really a negative impact on human health. But the truth is that the potentially damaging health effects of GMOs are now starting to become evident.

## Gripping Effects on Your Gut Health

You are in danger of getting a lot of long-term health effects from consuming GE foods. A good example is the Bt toxin produced by Bt corn. A study<sup>33</sup> showed that consuming Bt corn potentially causes gut permeability or “leaky gut” that can cause a lot of health problems. When your gut becomes permeable, everything that you eat travels directly to your blood, which can result in food allergies and food intolerances. Children are more prone to the dangerous effects of leaky gut and dysbiosis.

What’s more, studies have showed that glyphosate found in GMOs can actually harm your gut health, and may lead to many chronic diseases.

## Health Dangers of Glyphosate

Monsanto has stated that Roundup is safe for humans and animals, but its active ingredient, glyphosate, leaves traces of its residue on the food you eat. This is alarming, as your [gut bacteria](#) are a key component of glyphosate’s mechanism of harm.

Glyphosate functions through the shikimate pathway, which enables it to kill weeds without damaging the crop. Monsanto said that this sequence is absent in all animals. However, the shikimate pathway is present in the human gut bacteria.

In every cell in your body, there are 10 different kinds of microbes that make your body to respond to the presence of glyphosate. The toxic chemical can disrupt the microbe's function in your body and cause trouble in your health. It can also disturb your gut bacteria's shikimate pathway, which is a key player in the production of essential amino acids.

A report published in *Entropy*<sup>34</sup> links glyphosate to the increasing cases of chronic diseases such as:

- Autism
- Allergies
- Cancer
- Parkinson's disease
- Gastrointestinal diseases like inflammatory bowel disease, chronic diarrhea, colitis, and Crohn's disease
- Cardiovascular disease
- Infertility
- Multiple sclerosis
- Obesity
- Depression
- Alzheimer's disease
- Amyotrophic lateral sclerosis (ALS)

It strongly suggests how the glyphosate residue in our food is related to how these long-term ailments have increased. The authors said that these health problems may have risen from the biological disruptions caused by the glyphosate in your diet.

Before the fresh goods are made available to the market, they undergo a long process of cultivation. But when GE seeds came, the way the crops are planted changed.

## Economic Impact on Small-Scale Local Farmers

The effect of GMOs on small-scale farmers is evident. For example, GE crops are widely cultivated in various places in India, which is known to be as an agrarian country. But in 2009, there were 17,638 suicides of farmers due to high debts. And yes, indebtedness to foreign mega-corporations that promoted GMOs are to be blamed for this in many cases.



Cash crop cultivation has been the trend to India's farming industry that largely contributed to the vulnerability of farmers. Specifically, the local cotton industry has been dominated by big, foreign corporation that promote GE seeds and control the entire agricultural industry.

Monsanto promised that GE crops will bring more harvest to farmers, but it proved to be a false promise. GE crops require more water for cultivation. It also increased pesticide use as the weeds formed resistance against pesticides. It did not increase farmers' yields – only their debts. They weren't able to get back their investment from buying those GE seeds. Plus, they weren't allowed to save the patented GE seeds

because Monsanto would sue them for patent infringement, which forces them to buy GE seeds every year.

Monsanto has been suing farmers if they found GE plants are grown within their farm without the company's permission. The biotech company has claimed the right to own any plant bearing its seed, no matter how it got there. At times, farmers cannot avoid having GE seeds growing out of their farms; either those were blown away by air from a delivery truck or the pollen is carried by the wind.

This has become a major problem for small-scale farmers. Monsanto has filed over 140 lawsuits against farmers and they have settled another 700. Most farmers would rather pay a fine than spend money over a costly trial. Even worse, in 2014 the U.S. Supreme Court junked a law that was supposed to help the farmers against this bullying from Monsanto; giving way for big biotech company to continue harassing these small farmers.

## Chapter V:

# The Fight Against GMOs: GMO Labeling

Due to the potentially negative effects of GMOs, various organizations such as the Center for Food Safety and Organic Consumers Association (OCA) have formed a strong commitment towards the eradication of these products from the food supply.

One way to help eliminate GE crops and ensure that future generations can still eat organic foods is through GMO labeling. More than 80 percent of processed foods today contain GE ingredients. However, not all of them are labeled to identify that they contain GMOs.

## What Is GMO Labeling?

I am a staunch supporter of GMO labeling and proud to be one of the leading voices that promote it as the first step to eliminating GE crops from our food supply. Consuming GM foods may potentially cause negative health effects in your body and the environment, making it essential for you to know the contents of the foods you are buying.



Nowadays, buying foods from the grocery does not make you healthy unless you make the right decision to buy organic. That is why GMO labeling in foods is vital for you to know what you are really eating.

GMO labeling critics say that it will be costly to the manufacturers and will rouse fear among the consumers. But what is the truth behind this initiative and how will it affect American buyers?

The idea of GMO labeling is really simple: it will set GMO-containing foods apart from those that are purely organic and made from natural products. I strongly advocate GMO labeling as it will give you the option to choose the between the foods made from a laboratory and those that naturally came from Mother Nature.

## Why Label GMOs?

GMO Compass, one of the proponents of GMO Labeling, said this initiative gives the consumers the freedom to choose what they eat.<sup>35</sup> GMO labeling helps you choose foods that are not doused with heavy and toxic chemicals. Various polls and survey showed that more than 90 percent of Americans support the labeling of genetically modified organisms in their food.<sup>36</sup>

Ideally, food producers must be truthful in labeling their products. If a salmon is injected with eel genes, it is no longer a regular salmon, and such changes must be labeled accordingly. GMO labeling eliminates fraud from occurring – it will help uphold consumers’ right to know the truth about the food they are buying.

In countries such as Australia, France, Germany, New Zealand, Russia, Switzerland, and Saudi Arabia,<sup>37</sup> people are given the freedom and information to know the contents of their food which they consume, and foods containing GE ingredients are labeled as such.

So why can’t we, in the US, do the same?

## **GMO Labeling Is Practiced in Countries Worldwide – Except in the US**

Currently, there are 64 countries in the world that have banned GMO in their foods, including China and the European Union.<sup>38</sup> In fact, the same manufacturers of GMOs like Monsanto are the primary proponents of GMO ban in other countries. In European countries like Germany, Spain, Poland, Italy, and France, GMO labeling has Monsanto’s utmost approval. The biotech company even released advertisements regarding their support to label genetically modified organisms.

On the contrary, Americans are still trying their best to fight for GMO labeling in the country, with Monsanto and other biotech companies strongly going against it. There have been ballot initiatives or proposals to pass laws regarding the implementation of GMO labeling in numerous states in the U.S. There are states who won through the cooperation of its people to label GMOs in their processed foods. And there are some who lost the battle – but only by a narrow margin.

## **Biotech Companies and Processed Food Manufacturers Strongly Oppose GMO Labeling**

The food companies that you most likely patronize are not as sincere and upright as you think. They usually deceive you with their taglines for their products, proudly advertising that these are “healthy and good for you.”

The [Grocery Manufacturers Association](#) (GMA) is the perfect example of this. GMA represents more than 300 corporations such as Bayer, DuPont, Dow, Monsanto, General Mills, PepsiCo, and Coca Cola, who are the main opponents of the GMO labeling campaign.

GMA member companies have spent more than \$100 million to stop GMO labeling in more than 30 states. They also donated large sums of money that greatly helped in the defeat of GMO labeling ballot initiatives, like the California Proposition 37 and Washington Initiative 522.<sup>39</sup>

It shows that they are more than willing to spend so much money to save their companies even if your health is at stake.

I have named GMA as the “most evil company on the planet” because of its significant role in the movement to stop GMO labeling. They are willing to do everything and anything to protect the interest of their members. To prove this, they were caught in a money laundering scheme in 2013 during the I-522 GMO labeling campaign. They named the fund as Defense of Brand Strategic Account that aimed to protect its members who donated money for their campaign against GMO labeling.

They were later sued by Attorney General Bob Ferguson for intentionally laundering money and breaching the state campaign disclosure laws. This forced them to reveal their members who donated money.

But GMA did not let this pass by easily; they countersued proving that they are fighting to protect their members’ identity.

Food companies state that all they have in mind is the effect of these initiatives on you. According to them, it would be costly for the consumers if they will label the foods in accordance to their GMO contents.<sup>40</sup>

However, a study<sup>41</sup> was conducted that analyzed the economic impact of GMO labeling to consumers. It revealed that it would only cost about 2.30 dollars for each person annually. That being said, their real fear is that people might veer away from GMO labeled foods because of GMO’s potential dangers, and the food companies would not be able to handle the profit loss that it could bring.

Despite the efforts of the GMA and its members to hoodwink the public into thinking that GMOs are generally safe to consume and have the same benefits with organic foods, scientific reports and studies have proven otherwise. It is evident that they are doing great measures just to hide the very truth from you. Now is the time to make the wise decision: implement GMO labeling.

## The Truth About GMOs Is Out – Now It's Time for You to Do Your Part

For nearly two decades, Monsanto and other corporate agribusinesses have exercised near-dictatorial control over US agriculture – dominating our food supply with genetically engineered crops that do nothing for your health and the environment.

But the good news is that you can do something about it... and it starts with making the right choices.

### Vote with Your Wallet Every Day

Perhaps the most effective strategy you can do is to vote with your pocketbook. Boycott processed foods and junk foods that are made with GE ingredients, and buy only wholesome, organic non-GMO foods from small, local farmers that grow their food in a natural and sustainable manner. I also urge you to shop at local farmers' markets, community-supported agriculture programs (CSAs), or coops that will give you access to various foods, like grass-fed meats, dairy, and organic vegetables and fruits.



Better yet, visit your local farm so you can see exactly how the food is grown. Ask the farmer or owner how they produce their crops, take care of their animals, and ensure that their food is safe and of the highest quality. By going directly to the source, not only are you able to support natural, sustainable agriculture that ensures the future of our planet, but you're also able to get amazingly healthy, locally grown, [organic food](#) for less than you can find at your supermarket.

By doing this, you get the best of both worlds: optimally fresh food that is grown near you and sold with minimal packaging and less carbon footprint, and is produced without chemicals, GE seeds, and other potential threats to your health.

### Avoid 'Traitor Brands' Once and for All

I also urge you to ditch ALL processed and junk foods from your grocery list, as these are typically made with genetically modified ingredients. Most importantly, I urge you to boycott all traitor brands— brands that are masquerading as “healthy,” “organic,” and/or “all-natural,” but are actually owned by members of the GMA.

This is the best way to really put pressure on these GMA brands – by avoiding the products they market to organic consumers. By doing this, you are letting Big Agriculture and Biotech Companies know that you are refusing to put GMOs in your body.

The good news is, there are ways to find out which products actually contain GMOs. One way of doing this is by using the Non-GMO Shopping Guide created by the Institute for Responsible Technology (IRT). It offers a complete database of verified GMO-free products and sources. It's the perfect shopping companion if you truly want to make sure that you're avoiding ALL GMO products.

Last but not the least, I also urge you to support any GMO labeling initiatives in your state. As I mentioned before, labeling is the first step toward the elimination of GMOs in our food supply. By supporting efforts to enact GMO labeling laws in our country, you are making your voice heard and helping put a stop to genetic engineering – once and for all.

### **With Your Help, We Can Make the World GMO-Free**

The truth about genetic engineering and GMOs is out – and finally, public opinion about the biotech industry's contamination of our food supply and destruction of our environment has reached the tipping point. We're fighting back.

I hope that with the information you learned about GMOs, you can make smart choices that will not only ensure the sustainability of our planet, but also your and your loved ones' health.

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