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GMOs Revealed

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STORY AT-A-GLANCE

- While genetically modified organisms (GMOS) and the pesticides that go along with them are touted as the solution to feed the world, the reality is a far cry from this industry-spread ideal
- The problem with GMOs is one much larger than failed promises or misguided expectations; it's a form of technology that threatens human health, the environment and the very food supply we depend on

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While genetically modified organisms (GMOS), and the pesticides that go along with them, are touted as the solution to feed the world, the reality is a far cry from this industry-spread ideal. In reality, 86% of the value of U.S. agricultural exports in 2015 went to 20 destinations with low numbers of hungry people and high rates of human development scores.[1] The top recipient? Canada.

In 2013 as well, U.S. farms contributed only 2.3% of the food supply to the countries with the most starving people.[2] Such countries, unbeknownst to many Americans, actually produce most of their own food already. What they need is not for the U.S. to step up its production of genetically engineered (GE) corn and soy, but to be given resources to distribute and increase access to food while helping local farmers to earn a good living.

If we took GMOs off the market today, we would still be feeding the world with the same inefficacy that we are today. We have starvation. We have the biggest famine in human history happening over in sub-Saharan Africa right now. However, the problem with GMOs is one much larger than failed promises or misguided expectations.

Instead, it's a form of technology that threatens human health, the environment and the very food supply we depend on. At the foundation, "GMOs Revealed" seeks to answer a question that's relevant to all of us:

> *"What if the desire to use technology to enhance our world and save lives has evolved into a lust that, when paired with corporate greed and politics, becomes a catastrophic mass experiment that harms you and your family? Genetically modified foods, also known as GMOs, represent one of the most controversial issues in the world today. What is more vital to humanity, to each of us, than our food supply?"*

The Not-so-Green Revolution

As Zach Bush explains, many of the problems with industrialized agriculture began with the Green Revolution, which is not at all "green" as its name suggests. It's easy to forget that at one point, not so long ago, all food was organically grown in a way that supported the ecosystem and environment as a whole. This all changed in the 1940s when the Green Revolution took hold and industrial, chemical-dependent farming techniques quickly spread to become the norm.

When WWII ended, there was a glut of petroleum, and in petroleum are nitrogen, phosphorus and potassium — three nutrients needed for crops to grow. The Rockefeller Foundation funded the Green Revolution that led to the introduction of petroleum-based agricultural chemicals, which quickly transformed agriculture, both in the U.S. and abroad.

President Lyndon Johnson's Food for Peace program actually mandated the use of petroleum-dependent technologies and chemicals by aid recipients, and countries that

could not afford it were granted loans from the International Monetary Fund and the World Bank.

However, as happens in humans, when you isolate only a few nutrients and remove many others, you end up with a weakened immune system. "And so our plants started to fail," Bush said, "and started to be prone to insects and fungi and viruses." Again, instead of looking to the root of the problem of why the plants were failing, chemical companies introduced pesticides and herbicides to kill weeds and bugs.

Meanwhile, companies like Monsanto got into the business of killing plants via Agent Orange, which was used to defoliate jungles during the Vietnam War. After the war ended, it was time to repurpose their efforts to developing chemicals like organophosphates and glyphosate, which is now the active ingredient in Roundup.

Glyphosate Impacts on Human Health and the Environment

Glyphosate, the active ingredient in Monsanto's (now Bayer's) Roundup, is an herbicide like no other, as more tons of it have been sprayed worldwide than any other herbicide before it. Writing in Environmental Sciences Europe, scientists noted that in the U.S. and likely globally, "no pesticide has come remotely close to such intensive and widespread use."[3]

"Glyphosate will likely remain the most widely applied pesticide worldwide for years to come," they continued, which is alarming as its environmental and public health risks become increasingly apparent. Glyphosate is used in large quantities on GE glyphosate-tolerant crops (i.e., Roundup Ready varieties).

Its use actually increased nearly fifteenfold since such GE crops were introduced in 1996.[4] Glyphosate is also a popular tool for desiccating (or accelerating the drying out) of crops like wheat and oats, a use that began before the introduction of GE crops.

Monsanto, now Bayer, has steadfastly claimed that Roundup is harmless to animals and humans because the mechanism of action it uses (which allows it to kill weeds), called the shikimate pathway, is absent in all animals. However, the shikimate pathway is

present in human gut bacteria as well as soil bacteria and plants. In an interview I conducted with Bush in 2017, he explained:

> *"Glyphosate blocks an enzyme pathway … called the shikimate pathway. These enzymes are responsible for making some of the most important compounds in food [including] ringed carbon structures, such as tryptophan, that are the backbone of hormones. If you take away tryptophan from the plant chain or the plant kingdom by killing this pathway in bacteria and plants, the plant cannot make these essential signaling molecules …*
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> *It wipes out about four to six of the essential amino acids, which are the building blocks for all proteins in your body … There are only 26 amino acids. You take away four to six of those [and] you just lost a huge percentage of biology. There's a family of compounds called alkaloids … [When you] remove the alkaloids from food, what you see is the disease burst we have going on across so many organ systems in our bodies.*
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> *There's a family of [alkaloids] that are anti-parasitic … [others] are antidiabetic … anticancer … antihypertensive … anti-mood disorder … antiasthma, anti-eczema type of compounds.*
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> *You go through the list of alkaloids and [realize that if you add a] chemical to our food chain that wipes out the production of [alkaloids] … we [lose] the medicinal quality of food that has existed for thousands of years … [By using glyphosate] we robbed the soil and the plant from the ability to make these essential medicinal [compounds]."*

Further, research by Bush and colleagues has found that glyphosate actually hits the cell membranes of the intestine, which upregulates the receptor for gliadin, the gluten breakdown product that causes gluten sensitivity.

He believes that the surge in celiac disease and gluten sensitivity can be tied to the use of glyphosate as a desiccant, which, together with drying out the wheat early (leading to an abnormally high gluten-to-fiber ratio), created a perfect storm for biologic damage.

Gaining Access to Healthy, Non-GMO Food

Affordability and availability are two common hurdles to choosing organic, non-GE food. The third expert in "GMOs Revealed's" first episode is Gunnar Lovelace, CEO of Thrive Market, which cut out the middleman to provide online access to organic and non-GMO foods at affordable prices. Yet, another issue is the lack of labeling on GE foods in the U.S., which is why Thrive only carries products that are non-GMO. Lovelace said:

> *"The idea that we're going to engineer food crops like corn, wheat, soy and cotton to withstand systemic poisoning and the destruction of topsoil, the infiltration into water systems and 90 plus percent of Americans now testing positive for glyphosate through these Roundup Ready crops that are now in all … the packaged goods … that to me is the definition of insanity …*
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> *There are all sorts of studies that we're destroying topsoil at an alarming rate and there are only 60 harvests left on the planet. And so the way that we are producing, distributing and marketing and consuming food is going to leave this planet completely unsustainable for us and for our children."*

Thrive was also instrumental in the U.S. Department of Agriculture's (USDA) decision to allow participants in the Supplemental Nutrition Assistance Program (SNAP) — formerly known as the food stamp program — to shop online for food. This will allow people living in "food deserts" without access to healthy foods an option to secure healthier choices.

The company launched a petition for the cause in June 2016 and had gained more than 310,000 signatures just a few months later. "People are voting with their dollars and they're voting with their values," Lovelace said.

If you're new to healthy eating and are wondering what step to take first to get yourself and your family on the right track, Lovelace echoed one of my key tenets of healthy living: eat whole foods. "We need to eat food with way fewer ingredients, so the fewer ingredients listed the better … buy truly nutrient-dense food from a local farmer at a farmers market … eat as many veggies as possible."

Keep in mind, too, that it's important to choose organic, non-GMO animal products as well. The use of genetic engineering is prohibited in organic products — a significant benefit. Importantly, not only are GE seeds prohibited but animals raised on organic farms may not be fed GE alfalfa or GE corn.

Over the past two decades, the majority of the anti-GMO movement was focused on GMOs found in processed foods and a small number of whole GE foods. Yet that's only 20% of the GMOs in the human food chain.

Twice as much (40%) goes into the making of animal feed for **CAFOs**. The only way to change that trend is by not buying CAFO animal products, be it poultry (including **eggs**), pork or beef. While fruits and vegetables are the top selling category of organically grown food,[5] it's important to choose organic and **grass fed meat** and dairy products as well.

Sources and References

- [1, 2] Environmental Working Group October 5, 2016
- [3, 4] Environmental Sciences Europe February 2, 2016
- [5] Winsight Grocery Business May 16, 2023