

10,000 Years of Genetic Modification

Humans have been so successful at genetic modification throughout our agricultural history that many modern crops bear little resemblance to their native wild ancestors. Corn, for example, is so unlike its wild ancestor that its identity remained a mystery for decades. Only through DNA testing do we now know that corn's wild ancestor is a grass called teosinte, which is adorned with barely a dozen small hard-encased kernels (Genetic). As well, for 60 years radiation and chemicals have been used to scramble DNA in plants to create new strains of wheat, rice, peanuts and pears, to name a few. Many of which have become agricultural mainstays (Freedman). As *Discover Magazine* points out, "Shoppers who shun genetically modified foods in favor of 'natural' fruits and veggies may be in for a surprise... (at) the history of human meddling with plant genes since the dawn of agriculture" ("Hybrid"). Yet modern methods of genetic modification are under an unprecedented attack by anti-GMO (Genetically Modified Organisms) activists who use ignorance, misinformation, and fear to influence public consensus. The major debate today in food production is the call for mandatory labeling of produce and packaged foods that contain GMO derived crops. Connecticut, Maine, and Vermont have already passed labeling requirements with many more states considering such legislation (Chokshi). GMOs, however, are just an obvious progression in an effort that spans nearly 10,000 years to domesticate plants and improve crops through genetic modification. GMO foods do not need fear-inducing labels any more than staple foods that have been changed to a degree that even botanists are hard-pressed to identify their origins.

While most people are familiar with and relatively comfortable with the idea of selective breeding and hybridization, interestingly, these techniques introduce thousands of genes at once, swapping or altering large segments of the genome (Hopkin). Modern genetic modification, however, allows scientists to insert carefully selected individual genes with greater precision into a plant (Freedman). If the diet of an at-risk population is low in vitamin A or a country's potato crop is prone to blight, GM technologies have a much greater likelihood of producing a crop version to address these specific needs. GMO supporters argue that this precision makes the technology much less likely to produce surprises. Robert Goldberg, a plant molecular biologist at the University of California,

argues, “We know where the gene goes and can measure the activity of every single gene around it... We can show exactly which changes occur and which don't” (qtd. in Freedman). GM crops can be designed to limit the need for toxic pesticides, increase a crop’s nutritional value, or its ability to grow well in poor conditions. Thus, “providing critical help to people in developing nations who suffer from malnutrition” (Hopkin). Arguments over the differences between so called ‘natural’ hybridization techniques performed in a greenhouse and genetic modification performed in a lab is simply equivocation. Every living thing on the face of the earth shares much, or even most, of its DNA with every other living thing. We are all members of the same genetic community. Nature itself is responsible for each of us being here through the process of random gene mutations. So, to say that by adding a few genes to a crop is somehow ‘unnatural’ and something to be feared is the height of deceit. It is difficult to present the opposition’s side of the debate because of this deceit. Arguments become so convoluted that it becomes obvious to the impartial reader that its primary purpose is to distract.

Greenpeace, in their opposition to Golden Rice, a GM crop with just 3 genes added to the over 30,000 already found in rice, is a prime example of this type of convoluted distraction. Golden Rice was created as an answer to the need to combat vitamin A deficiencies, the leading cause of preventable childhood blindness, affecting hundreds of thousands of children per year, half of whom die within 12 months, in countries with rice-dominated diets (“Nutrition”). In opposition to the spread of multinational agribusiness, Greenpeace characterizes Golden Rice as a “fake remedy for vitamin A deficiency,” arguing that “...using GM crops to try to solve problems of malnutrition is simply the wrong approach, and ... does not address the underlying causes of (vitamin A deficiency), which are mainly poverty and lack of access to a healthy and varied diet” (“Ecological”). Instead, Greenpeace proposes their own agenda driven alternative solution, “a combination of vitamins supplementation and home gardening” (“Ecological”). As absurd as it sounds, this is their solution to one of the world’s major nutritional problems affecting half the countries in the world populated by billions of people. While it is understandable for critics to want to limit the concentration and influence in our global

food systems by agribusiness giants like Monsanto and Cargill, it does not excuse the act of spreading false information in an attempt to discredit a technology that could potentially save millions of lives.

Another commonly deployed strategy used by GMO critics is to spread unreasoned fears concerning GMO crops. Without providing any kind of evidence that GMOs pose a risk in the first place, it is common for GMO critics, such as the Non-GMO Project, an initiative of independent natural foods retailers, to use suggestive language like the following: “Some ingredients that seem low-risk may have less-visible high-risk ingredients” and “Contamination incidents have occurred with seemingly ‘low-risk’ products” (“GMO Facts”). The use of the words *risk* and *contamination* are not only unwarranted and disingenuous, but an obvious attempt to emotionally influence the reader without having to go through the trouble of proving that GMOs are, indeed, harmful. It is tactics like this that are responsible for widespread GMO skepticism, an attitude that has become so prevailing that even some science advocates have succumbed to the propaganda. An episode of *SciShow*, a popular *YouTube* channel that covers science-related topics, was so unscientifically-biased against GMOs that it drew heavy criticism from followers and ultimately resulted in *SciShow* taking the video down and promising to redo the episode ... something that has yet to happen a year and a half later (Power). In regards to the supposed risks of GMOs, a comprehensive review of the scientific literature on GM crop safety during the last 10 years, published in the peer reviewed academic journal *Critical Reviews in Biotechnology*, concluded that “the scientific research conducted so far has not detected any significant hazard directly connected with the use of GM crops” (Nicolia et al. 1).

In the public interest we have enacted laws that govern product labeling. Regulated labeling practices of packaged and prepared foods serve a purpose, whether to identify the product and ingredients, provide nutritional and storage information, or to caution about possible spoilage and allergic reaction. Each is mandated for a specific public health reason. Other common food labeling is voluntary and is done for marketing purposes. This type of labeling identifies the food for the convenience of those who prescribe to a specific type of diet such as kosher, sugar-free, or organic. GMO foods are fundamentally no different from their non-GMO counterparts; require no special handling, storage, or preparation and pose no known inherent health risks. Those who wish to adhere

to a non-GMO diet, therefore, would be adequately served by the second voluntary type of labeling. Thus, food producers that wish to capture this portion of the market are more than free to identify their food products with “non-GMO” or “GMO free” labels, similar to organic food producers. No special regulatory labeling is necessary. Anti-GMO activists who call for the labeling of GMO foods are once again being disingenuous when they insist that their reasons are health related. The only effect that mandatory labeling of GMO foods would have is to unnecessarily stigmatize them.

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