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There are only two choices regarding food consumption, organic or genetically modified. Because of this there is a great deal of controversy surrounding the safety and effectiveness of genetically modified organisms (GMOs); based on allegations made by GMO assailants. However, these controversies are rooted in unjustifiable claims. The organic industry is set on getting rid of genetically modified (GM) crops. They are the organic industry's biggest competitor. The organic industry attacks GM crops to hide their real motives; controlling what customers purchase by creating social stigmas regarding GMOs. A method used against GM crops is the largely debated labeling issue. Organic industries want food that has GMOs to be labeled as such. However, the organic industries involved only want GM crops to be labeled in order to increase their own profits by decreasing GMO sales. They also use the made-up pretext that organic foods are safer than GM foods. However, the American Academy of Pediatrics states that "there is currently no direct evidence that consuming an organic diet leads to improved health or lower risk of disease" (Laufer). It is essential to know the benefits offered by GM crops, because there are many reasons why GM crops are better than non-GMO crops. GM crops are responsible for the increase of nutrition, food supply, as well as benefiting the environment.

In order to understand why there is so much controversy surrounding GM crops, it is vital to understand how GMOs were first developed.

GMOs were created “in 1972 when Stanford University researchers cut DNA from two different sources—a bacterium and a virus—and spliced them together into a functional hybrid, or ‘recombinant’, DNA molecule. A year later, scientist successfully transferred a recombinant molecule into a bacterium, thereby creating the first genetically engineered organism” (Honsansky).

This quote explains that genetic engineering was a new concept for scientists, at that time. While it took time for scientist to become fully acquainted with the potential offered by genetic engineering, they nonetheless began to understand the impact it could have on the human population. In fact, transferring DNA successfully from a microbe into another plants required years for scientist to perfect (Honsansky). Eventually scientists were able to master the art of transferring, inserting, and deleting genes from one organism to another. This paved the way to a genetically engineered uprising, regarding agriculture, known as the Green Revolution. The production of GM crops had almost no restrictions because it was an entirely new concept at the time (Honsansky). The Green Revolution was a period of time where scientist began developing GM plants by a dime a dozen. This increase in GM crops has helped feed millions of hungry people around the world.

Before all else, GM crops will be able to potentially provide relief to all children in great need for food. However, progress is being impeded by GMO assailants. There is a lot of distrust between GMO assailants and GMO supporters regarding a scientist’s ability to control genes. This distrust is costing millions of children their lives. The anti-GMO community claims that a

scientist should not be able to play god and create a new type of life. However, farmers have been cross breeding plants for hundreds of years; genetic engineering only speeds up the process (Price). There are many examples of the benefits that GM crops provide to billions of malnourished people.

One example of GM crops saving the lives of billions is through golden rice. According to Tom Price, a journalist at CQ Researcher, he states that “[g]olden rice was created in 1999 by Ingo Potrykus . . . and Peter Beyer . . .” (Price). What Potrykus and Beyer did was place two different genes, one from a daffodil and the other from a microbe into rice, so that the rice could produce beta-carotene (Price). The insertion of two genes into a single plant managed to save millions of lives. The truth is that “the United Nations Children’s Fund predicts that eliminating vitamin A deficiency [prevented] one or two million deaths each year among children aged one to four . . .” (Magner). Creating plants through genetic engineering has proven to save millions of lives. Scientists are researching even more ways to genetically engineer plants; in order to provide much needed nutrition to developing countries.

What this implies is that fewer children will be dying as a result of malnutrition and starvation. Scientists have theorized GM crops that are potentially capable of ending famine worldwide. Many people in developed countries do not experience hunger, because of GM crops, so it is hard for them to understand what hunger is. Yet, the Food and Agriculture Organization “defines hunger, or undernourishment, as ‘not having enough food for an active and healthy life’ or not being able to meet ‘dietary energy requirements’” (Price). With hunger defined it is also vital to know just how many are affected by it. Around half of all five year old children that die, die from hunger; and the death toll is around three million (Price). Hunger is an enormous

problem in today's society and GM crops are the answer. The reality is that around half of the human population is malnourished (Pimentel). Scientists have the technology to prevent this from happening, to prevent millions of deaths, using GM crops. Yet, it is being hindered. The misinformed public does not believe that GM crops are in fact safe, even when GM crops will be able to help millions in the future.

The future, like many things, holds potential and hope but the fate of GM crops is still unclear. The organic industry persists that GM crops are not beneficial for human health even when the World Health Organization states that, “No effects [regarding] human health problems have been shown as a result of the consumption of GM foods” (Morgan). It is unreasonable for the GMO opposition to think that GM foods are not safe. Over the course of fifteen years, “trillions of GMO-grown meals have been eaten...” (Morgan). This means that the opposition can no longer argue that GM foods have not been tested on humans; the public has been consuming GM foods for a very long time. Scientists have consistently proven that there are no adverse effects to eating nutritious GM foods. Not only will GM crops affect the amount of nutrition people consume but it will also be able to increase the world's food supply.

Subsequently, the increase of the human population is the biggest danger to the world's food supply. The United Nations expects an “increase of more than one billion people by 2030” (Morgan). What this implies is that if farmers do not increase the food supply there will not be enough food to go around, especially with the large amounts of people expected in the future. Not mention that there are 250,000 additional infants born every day (Pimentel). This is a major crisis for the agricultural industry; they need to increase their crop production efficiently to feed the billions of people in the future. The problem is that it is currently very taxing for the

agricultural industry to provide enough food for every person in the world today, not to mention in the upcoming years with the possible decline of GM crop production. The only way the agricultural industry might have a chance at feeding billions of people is by increasing GM crop production. There are billions of hungry people in the world as it is; but GMOs will be able to decrease the intensity of worldwide famine. GM crops, as opposed to organic crops, have a “40 percent...increase in yields” (Pimentel). This means that with more GM crops farmers will be able to produce more food. This will greatly impact the way billions of impoverished people are fed worldwide.

The introduction of GM crops has made a great difference on the number of hungry people around the world. Truthfully, “new agricultural technology has enabled global food supplies to outstrip population growth, driving down the number of hungry people around the world from just over 1 billion in 1992 to 842 million today- a 17 percent drop” (Price). Refusing to feed the hungry is inhumane and even Nobel Laureate, Richard Roberts, “called opposition to GM crops a ‘crime against humanity’” (Price). This explains that the opposition against GM crops is more unethical than its support. To refuse to help developing countries feed their citizens, when fully capable, is cruel. The United States is a great example of the relationship between developed and underdeveloped countries.

The United States is the country with the most GM crop production and because of that “[it has] delivered nearly 2.2 million metric tons of food aid in 2012, more than twice the combined amount of the next three largest donors- Japan, Brazil and Canada” (Price). By eliminating the negative stigma around GM crops, which GMO assailants started, more countries will be able to feed the impoverished (Magner). In regards to food supply “...the benefits [of

GM foods] outweigh the dangers [and]... to hesitate is to court disaster” (Magner). If scientists are capable of producing GM crops that will be able to increase world food supply, then it would be inhumane not to take that chance. This is even more prevalent when GM crops benefit the environment as well as the food supply.

The positive impact that GM crops have had on the environment are immense and extremely important. GM crops use much less land than non-GMO crops and produce even more food. To create room for new crops, farmers demolish natural habitats and this has a major impact on biodiversity (Pimentel). A decrease in natural habitats not only affects the environment but the animals living in those habitats; it is reasonable to concur that without a suitable habitat many species will go extinct. This is a red flag for environmentalist. For example, Peter Laufer an author for the Washington Post, explains that, the “coastline preserving mangroves in Southeast Asia are [being] ripped out...to make space for palm-oil plantations, rice paddies and coconut farms” (Laufer). Natural habitats have been endangered to make room for farms, for many years. By reducing the amount of space taken by new crops GM crops are preserving natural habitats and biodiversity.

Another way GM crops are helping the environment is by reducing the amount of insecticide used in glyphosate resistant crops. Glyphosate is the main ingredient in insecticide and herbicide. In fact GM crops that have glyphosate resistant properties, have helped around 7 out of ten growers use less insecticides (Carpenter). GM crops also use more environmentally friendly herbicide. There are two forms of GM crops that are herbicide resistant. The first is Roundup Ready. The other is in the form of “herbicide-tolerant seeds [that] have been modified to make them resistant to glyphosate” (Weeks). Herbicides and insecticides are essential for

protecting crop yields, against insects and weeds. However, they have also been shown to damage the environment. Glyphosate depletes the nutrients found in the soil and when it leaks to lakes or rivers it contaminates fish (Weeks). That is why by reducing the exposure of pesticides and herbicides “GM crops have [increased] agricultural sustainability” (Carpenter). GM crops hold so many benefits for the environment. As a matter of fact another major contribution that GM crops have on the environment is in regards to water.

Genetically modified crops can be engineered to be drought resistant, decreasing the amount of water used in the agricultural sector. A report by the UN’s World Water Development “warned that unless the balance between demand and supply [of water] is restored. The world will face a ‘global water deficit’ of 40 percent by 2030” (Morgan). This report proves that unless crops use less water, the world will become unsustainable. The report conducted by the United Nations explains that cutting water usage on the sectors that use the most will reinstate the balance between water’s supply and demand (Morgan). Non-GMO crops use much more water in contrast to crops that have been genetically engineered to be drought resistant. There needs to be major cutbacks on water. The agricultural industry uses the most water; “this means that, unless major reductions in agricultural water use can be achieved, dire shortages of both water and food affecting billions of people are inevitable” (Morgan). By cutting the water usage of agriculture there might just be enough water to go around; with the use of drought resistant GM crops. This is just another example of how GM crops are beneficial and vital for the future and the environment. The opposition will stunt the progressive growth of GM crops by arguing and inciting fear into people, making them less likely to buy and support GM crops.

The opposition of GMOs argues that GM food should be labeled, but the process has dire consequences on the economy. In her article, “Pro-Con: Should Genetically Modified Food be Labeled?” Melissa Crowe maintains that, “engineered foods pose no risk. [Yet,] consumers are now pushing for the labeling and even elimination of genetically modified foods” (Crowe). Labeling is one thing but the elimination of GM crops will shock the world with hunger. With less crop production there will be less available food to give to needy countries (Crowe). This causes mass starvation in countries that depend on these imported goods. Labeling in itself is widely controversial because it will increase the price of GM foods, making them unaffordable. Affordability is the reason the U.S. is able to provide so much food aid to countries (Price). Increasing the price will defeat this purpose. This is the main reason why organic industries want GM crops to be labeled.

If consumers do not want to consume GM products, then all that is needed is to look for the organic seal. In fact research conducted in a journal by Agrobiotechnology Management and Economics concluded that “mandatory labeling acts as an import barrier and diverts trade” (Crowe). By making food aid less cost efficient developing countries are being robbed of the opportunity that GM crops provide them. The manufacturing of GM crops greatly increases the capital of developing countries that use them. This is vital for bringing poor countries out of poverty, one of the main benefits of growing GM crops. Not only will labeling laws impact developing countries but it will also impact the developed countries that help them.

Labeling laws will have a huge effect on the United States because “the cost of rebuilding the infrastructure would be expensive” (Crowe). Shipping large quantities of food to far away countries is taxing enough, without the increase that labeling will cost. What the organic industry

needs is “science driven public policy that captures for review those products that require it and exempt those that don’t” (Miller). The Director of Biotechnology Industry and Organization agrees and states that “because [GM] foods are indistinguishable from foods produced through conventional means, it would be misleading to consumers to label them” (Honsansky). What this means is that unless there is quantifiable differences between organic and GM foods then labeling will not be appropriate. The opposition states that labeling will help make consumers a better choice when choosing produce however it is unimportant when there is an organic seal already at play, distinguishing one from the other. The opposition not only questions why there are not labels on GM product but they also question the safety of creating GM crops.

A major concern for the anti-GMO population is the possibility of genes transferring from plants to humans. For example consumers are worried that the glyphosate gene in pesticide resistant crops will transfer to humans and cause humans to produce glyphosate. However by researching GM crops, people will be able to understand that is not the case. All the cells in a glyphosate plant, for example, have the gene for glyphosate. But not all the cells actually produce the protein (Price). People who consume glyphosate resistant foods are not ingesting glyphosate and the genes are not going to transfer. The GMO opposition also states that GM foods have not been tested on humans. They continue by stating that there is not enough research to know whether GM crops are safe or not. The public has been consuming genetically modified foods for over 15 years, enough time for any symptoms to appear (Morgan). Yet, there has not been a single reported issue caused directly by the consumption of GM foods.

Another issue regarding GM crops is discrimination between non-GM crops and GM crops. GM crops have unfair intensive regulations that often prevent advances from occurring

within the field of genetic engineering. What needs to be done is that “the degree and intrusiveness of oversight should be based on the risk posed by the introduction and should not turn on the fact that an organism has been modified by a particular process or technique” (Miller). It feels like GM crops are being discriminated against because of false pretexts made by non-GMO industries. There is proof that GMO assailants have fed their congregation with lies. The very creator of the anti-GMO undertaking, Mark Lynas, states how anti-GMO supporters “employ a lot of imagery about scientist in their labs cackling demonically as they tinker with the building blocks of life...” (Morgan). He continues by explaining the goal for anti-GMO groups; “this absolutely was about deep seated fears of scientific powers being used secretly for unnatural ends. These fears spread like wildfire... This has been the most successful campaign I have ever been involved with” (Morgan). Mark Lynas was convinced of the safety and effectiveness of GM crops soon after conducting a little research. However, Lynas’ following has coined him a traitor and has cast him out (Morgan). If all it takes is a little research to convince the founder of the anti-GMO movement then all that is needed is educating the public regarding GM crops. If the doubt that GM food is not safe continues, progress will continue to be hurdled.

GM crops hold much promise for the future. The organic industry needs to realize that without GM crops “malnutrition will become more widespread...” (Magner). The best action GM crop supporters can act on is informing the public. By informing the public GM foods will no longer be seen as unfit for human consumption; nor will there be any controversy about labeling. The choice is clear; GM crops are much more beneficial than non-GM crops. GM crops provide benefits for the nutrition, world food supply, and the beloved environment.

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