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The benefits and myths of Genetically Modified Crops.

Genetically modified crops are an increasingly hot topic in the news today. Genetically modified crops are being used, at a growing rate, for the cultivation of food for human and animal use since the nineties. There is a disagreement about the benefits and safety of genetically modified crops. Some people believe that genetically modified crops are a danger to the environment as well as human and animal health. Despite this disagreement, genetically modified crops are beneficial for society because they do not cause serious harm to the earth and its inhabitants while providing proven benefits and minimal issues. One benefit of genetically modified crops is the relative ease with which they can be cultivated.

According to a document released by the Food and Agriculture Organization of the United Nations, genetically modified crops have key benefits because they can be engineered to have attributes such as pest resistance, herbicide resistance, and viral resistance (FAO). Scientists are also working on trying to engineer these crops so that they also have increased nutritional value, such as increased concentrations of carotenoid which is needed for vitamin a production (FAO). Scientists are also using plants for the production of pharmaceuticals and even vaccines (FAO). In addition to making the crops more resistant to the environment and nutritious, the use of genetically modified crops has made farms more profitable and has even reduced the impact that agriculture has on the environment.

These changes have also made farms more productive, efficient, and profitable. Farms have experienced massive increases in profits because of the efficiency that genetically modified crops have allowed; between 1996 and 2012, the total global increase in profits of farms that use genetically modified crops was 116,590.4 million dollars (ISAAA). Since 1996, the farmers that have switched to genetically modified crops have seen an 8.8% reduction in pesticide use; that equates to a reduction of roughly 503 million kg of pesticides (ISAAA). This reduction of pesticide usage has allowed the environmental footprint of agriculture to drop by 18.7% (ISAAA). Environmental footprint is defined as a "measure of the effect or impact a product, process, operation, an individual or corporation places on the environment" (ISAAA). However, despite these demonstrated benefits, there is an argument to be made against genetically modified organisms.

It has been argued that because there is a lack of science behind the health effects of genetically modified organisms, we cannot safely assume that the crops will have no negative health effects on humans and animals (Univ of Michigan). Studies have shown that introducing new genes to the dna of a plant can cause it to produce new allergens that could be fatal to some people (Univ of Michigan). People could ingest these "safe" foods and unknowingly introduce an allergen that could cause a fatal or debilitating reaction (Univ of Michigan). The chances of these effects harming people are very slim though.

The United States Food and Drug Administration holds genetically modified foods to the exact same standards as every other food that it regulates (FDA, para 3). The regulations that the FDA has set forth for consumable food are very strict (FDA, para 3). In order to ensure that the food is lawful under FDA regulations, the developer will undergo a voluntary assessment where the developer sends the FDA a detailed report on the distinguishing genetic and toxicological

attributes of the product in question (FDA, para 3). The assessment is only complete when the FDA scientists are satisfied with the developers safety assessment (FDA, para 3). While there is always danger in introducing a new technology, the stringent regulations of the FDA and other regulatory agencies helps set a minimum safety limit as well as the needed infrastructure to find and react to whatever dangers might be discovered. In addition to these stringent guidelines, useful data regarding the safety of genetically modified crops can also be gained from animals.

A recent study, published in the Journal of Animal Science, reviewed 29 years of livestock health and productivity data (Entine, para 10). Farmers are required to keep health statistics about their livestock because it is illegal to feed sick animals to humans and the broad scope of the study means that over 100 billion animals were represented in the data (Entine, para 11). This study compared the data from before the introduction of genetically modified crops in livestock feed and after, where the percentage of genetically modified crops in livestock feed jumped to 90% and higher (Entine, para 11). The study found that the genetically modified feed is nutritionally identical to non genetically modified feed and no unusual trends were found in the animal health after the introduction of genetically modified food (Entine, para 12). This study in addition to others, indicates that genetically modified food does not cause abnormal side effects in animals; while animal data does not completely reflect how the genetically modified food will affect humans, it is a very strong indicator of the safety of the food.

Genetically modified food has been a topic of hot debate since its introduction. However, despite the evidence that indicates that genetically modified crops can produce unexpected toxins and allergens the benefits and the strict rules that genetically modified foods are regulated under outweigh the potential dangers and drawbacks. More people need to become active and educate

themselves about the benefits of genetically modified food so that we can help fund research to make genetically modified foods both safer and more productive.

Works Cited

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