

Health And Economic Risks Associated With The Use Of Genetically Modified Food

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Introduction

Genetically modified foods have been a topic of interest for agricultural researchers for many years. This technology has gained broad public awareness after its discoveries when discussed on media and social platforms. The latest controversial study about genetically engineered tomatoes and corn. After the issue was addressed on public platforms, it gained awareness among the people of America. When the problem became known, the United States Food and Drug Administration (FDA) held meetings in different districts to collect public opinions about the popularity of genetically modified foods. The FDA has made a regulatory authority to set permission for approval and penalties for genetically modified foods. There are several environmental concerns and health risks associated with the use of genetically modified foods, as well as some economic and trade issues.

The term genetically modified foods has now become a debatable topic for both agricultural experts and end users. Public concerns about the issue are increasing which mainly are about the short and long-term effects of genetically modified foods, there are no doubt some potential risks involved with the process, but research are carried out to make genetically modified foods more consumer friendly and with less environmental and health risks. Studies have provided arguments both in favour and against this technology, but this technology will no doubt decrease the cost and increase the availability of foods. The technology has several agronomic and financial impacts on agriculture. This paper will provide an exploratory synthesis of four sources that focus on the benefits and potential risks involved if the technology is made accessible and will offer the public opinion and acceptance of this technology for agricultural modification and health concerns. We will analyze the claims about this issue and evaluate the authors' response to the acceptance of genetically modified foods.

Discussion

Genetic modification of foods is aimed at creating nutritious foods that are less expensive in areas where agricultural conditions are not favourable and natural crops cannot grow effectively. This technology improves the genetic structure of the species and increases their resistance to diseases, and ability to withstand harsh weather conditions, these crops are less susceptible to insect attacks and have a higher growth rate. The past method of selective breeding of crops was found less useful than this method of gene modification, which is less time-consuming and has better accuracy. This method selects a positive ability gene from various plants and inserts it into another plant. By this

method, the target plant is best in all qualities as it then contains all positive factors from multiple parent plants. These plants then need less water to produce better crops. The following paragraphs will discuss various studies made on genetically modified foods and respond to these studies.

Geoffrey Barrows and Steven Sexton did the research, and David Zilberman, a professor from the University of California and North Carolina State University, provided the arguments in support and against the use of genetically modified crops. It gives critics arguments for adverse environmental effects that are expected if this technology is made public, and the supporting arguments include potential benefits in improving growth and decreasing prices of the crops. These arguments include less usage of pest control medicines as crops are more resistant to pest and bacteria attacks, as well as the soil erosion factor (Barrows, Sexton, and Zilberman, pp. 100).

Genetically modified crops increase crop yields. The crops increase in their ability to resist high pressures, and less cost is required for damage control. The amount used for insecticides in agriculture is a concern for underdeveloped countries, as farmers use excessive pesticides to achieve maximum yield from crops and increase revenue. In a research, it was found that the use of pest-resistant cotton in India has grown yield by up to 37% in cotton fields in India and China. A similar increase in yield is seen in the field of genetically modified corn crops in Africa, Argentina, the Philippines, Spain, and the US. Therefore, the effect of gene modification on crop yields is inevitable (Barrows, Sexton, and Zilberman, p. 105).

There are environmental concerns linked with genetically modified crops, mainly due to the resistance that weed plantations have developed by this method. There are now ten types of weeds that have increased in their strength, including pesticides and glyphosates. These herbicide-tolerant crops need more dosage of pesticides, as well as more effective insecticides as they have developed immunity to the normal dosage of chemicals used in pesticides. These weeds multiply in number and develop by interbreeding with non-gene-modified crops, and the result is an increased number of modified crops.

The study by Scott, Inbar, and Rozin from the University of Toronto and Pennsylvania is a survey about the use of genetically modified crops and provides statistical data about the acceptance and opposition to this technology. This survey was about moral concerns and attitudes regarding the use of genetically modified crops. It was observed from the study that most of the opposition to gene-modified crops is the factor of disgust. The majority held the view that despite its positive benefits, this technology should not be used as it is immoral and against nature (Scott, Inbar, and Rozin, 2016).

The findings were presented in the form of a graph indicating that the majority of the people rated this technology as the most disgusting thing, followed by people who found it moderately disgusting and lastly, a small percentage who were supporters of the technology. It was observed that most people had less information about the process, but their opposition was based on the disgust that they associated with the process. The questionnaire included questions that mostly asked their bias about the process irrespective of its benefits.

The research provided three conclusions. The majority of people who opposed this process held complete response about this process and said that they would not agree to use this technology even if it is beneficial and proved to have good economic effects, as the opposition was linked to disgust their opinions were stiff. The resistance because of the level of disgust is directly in compliance with the legal restrictions about genetic modification.

This study proved that people are not willing to accept something if they find it disgusting, even if it has many potential benefits. Their moral values are linked to the acceptance of any new technology. The attempts to change concepts about genetic modification are less useful as moral values do not allow people to agree to the use of unnatural things (Scott, Inbar, and Rozin., 2016).

Research by Klümper and Qaim is carried out on the agronomic and economic impacts of genetic modification. The study used factors like crop yields, the quantity of pesticide used, and agricultural costs. This study also discusses the differences in crop yields of genetically modified and non-modified crops and provides percentage differences in growth of both types. The research proved that genetically modified crops reduced 39% of the cost of pesticides and their usage by 37%. The production of crops was not found to increase much with the introduction of genetically modified seeds, but the average revenue for farmers generated by the process increased to 69% (Klümper and Qaim., 2014).

The analysis of the heterogeneity and economic benefits of genetically modified crops is significant. The yield and farmer profits from the use of genetically modified crops are higher than the crops that are produced by the average crops. The research analyzed different types of data and applied various tests. These multiple tests were made because if only a single factor were discussed, the results may vary due to other factors, too. The combined outcome of all these results was affected by other uncontrolled traits, but these minor variations were negligible. The results of the study proved that crop yields were better when genetically modified crops were used, and this technology was highly appreciated by the farmers as their income increased.

Another study on the advantages and disadvantages of genetically modified crops was carried out by researchers in China. This study compiles information about the potential benefits and risks involved in this technology. The study provided reasons for the need for genetically modified crops. With the growing population of the world, the consumption of food has increased, and with it, the demand for plants has increased yield. The study provided geographical data that provided an increase in population over the years. The researchers argue that to fulfil the needs of this growing population, the use of modified crops is necessary. They argue that the use of technology to meet food requirements is inevitable and viable. They think that the genetic engineering of plants is a potential solution to the problem and will bring qualitative improvements to agriculture (Zhang et al., 2016).

This study claims that available land for cultivation is decreasing. According to metrics, the net available land for farming per person will reduce by another 25% of its current value by 2050. Using this less available land for farming will yield fewer crops that won't be sufficient for a population that

is increasing every year. The use of more effective pesticides and agricultural methods of weed control is inevitable in increasing the yield of crops. However, the use of genetic engineering will be a big step towards this improvement as it will boost our agriculture and improve our crop yields drastically. Genetically engineered crops also need less water and pesticide cost; therefore, it will save our economic resources too,, which can be used for other purposes.

The study presented three significant risks linked with the usage of genetically modified foods. These problems originate with the selective insertion of genes from various species. Sometimes, the inserted gene with its benefits is a problem in the crop that may not be apparently harmful but proves to be dangerous after its excessive usage (Zhang et al., 2016).

One of these problems is the allergic nature of some of the added genes. Sometimes, when a gene from a plant is inserted into a crop, the crop develops a nature that is allergic to some consumers. An example of the case is “Starlink maize” (Zhang et al., 2016). This crop when genetically engineered with “Bacillus thuringiensis” it develops pesticidal properties, that is reported to have an allergic reaction to some people. This allergic reaction will be more severe if the plant is modified by engineering with a more robust pesticidal organism.

Another risk to genetic modification is the toxication of the plant that results from genetic engineering with a species that alters the metabolism of the target plant. This alteration results in the secretion of more harmful toxins, which, if consumed, create potential risks for consumers. If the consumer is allergic to these toxins, the reaction can be more severe, and it may lead to regulation against the use of these genes.

The last and by far the most severe biological factor of genetic modification is the likely reaction of weeds and insects against the use of this particular genome technology. The purpose of genetic modification is to improve plant genes and increase their resistance to insect and bacteria attacks. However, it’s only a matter of time before bacteria develop immunity to the pesticidal nature of these crops, and a more severe attack happens (Zhang et al., 2016). This factor can cause a considerable problem as new and improved pesticides will be required to save crops from insect attacks. Advanced genetic modification will be necessary to keep plants safe from disease attacks. This problem will increase both costs of agriculture and can cause an agricultural crisis.

Another risk that is linked to the consumer is that the continuous intake of these genetically modified crops in food will cause antibiotic resistance to gastrointestinal bacteria. This person, by consuming the food changed in its genetic structure, this genetic modification may be adopted by the benign bacteria, and it may be more resistant to antibiotics. The person who falls ill will need more advanced antibiotic medications to fight against this modified bacteria. This will also increase the cost of healthcare and will need more advanced research to overcome the adverse effects of genetic modification.

Conclusions

In short, the consumption of genetically modified foods cannot be justified by just arguing about its potential benefits. The health and economic concerns are to be evaluated, too, if we want to shift to genetically modified crops. If the process is to be applied on a larger scale, scientists have to minimize the health risks to zero. The process needs to be addressed with more economic research and how this technology will benefit the farmers. Governments must also listen to consumer preferences regarding whether they will consume such food. The advantages of the technology are astounding, but the process needs a lot of research before it can be used as a solution to current population expansion and a decrease in food facilities from available lands.

Works Cited

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