



Genetically Modified Food

Introduction

The ever increasing human population has posed a significant threat to human survival because it has limited food sustainability. The government and the humanitarian organizations have responded to the threat by investing in research in the agricultural sector. This has led to the development of the herbicides, pesticides and the fertilizers. However, the design of these chemicals did not adequately address the problem. This forced the scientist to go back to the drawing board and come up with a better solution for the problem and these led to the introduction of the genetically modified food. The World Health Organization defines genetically modified organisms as an organism whose DNA (the genetic material) has been altered in a way that it does not bring damage to the plant and in a way that it does not occur by natural means such as recombination and mating (Blair & Regenstein (2015)). This process is always achieved in the scientific laboratories where one or more gene is added to the organism's genome, and that which is considered to be of minor advantage is removed or mutated in a way that the gene can be of greater help to the organism. After the generation of the body, testing is carried out to ensure that the desired qualities are achieved. The subject of genetically modified food has drawn a lot of debate on the advantages and disadvantages on human health. However, I think GM food has more advantages than disadvantages this is because;

Genetically modified food has reduced the use of pesticides.

The use of synthetic pesticides was embraced in the year 1947 with the aim of reducing crop losses caused by diseases, insects, and weed. Before the introduction of the pesticides, the world registered 43% loss on its production for eight of the major crops. The use of pesticides has reduced the loss 30% that may have been encountered by farmers. This has also been witnessed in such nations as China, where the use of pesticides has saved millions of tons of their crops and fiber. However, pesticides have not adequately addressed the challenges that have accrued to man as a result of population growth because of their levels of toxicity. There are significant problems that came with the adoption of this mode of food production, the most notable being poisoning, soil pollution as well as air pollution. The poisoning can occur during use when the person does not wear protective clothes or when the person using the pesticide does not have enough knowledge on the type of chemical he is handling. Over-usage of the pesticides also poses a great danger to both the consumer and the plant since the toxicity level will be increased.

Due to discoveries in the new technology, pesticides with lower toxicity have been discovered that do not pose a great danger to human and the crops. Genetically modified technology has played a significant role in reducing the threats caused by the use of pesticides (Phipps & Park, 2002). The technologically produced crops will only work with the traits instilled in them through gene transfer. Some of these traits are modified in such a way that they become herbicide and pest tolerant.

GMOs have nutritional and medicinal benefits

Human-made foods not only address the challenge of food security but also promote health amongst the global populace. According to the United Nations Children's Fund about 40% of the under-fives are affected by deficiency of vitamin A. the situation has caused the death of an approximated one million children every year. Genetically modified organisms are rich in nutrients that boost human immunity. The nutrients help in the prevention of malnutrition amongst developing children across the globe because its contents are expressly made to counter such illnesses; unlike in the case with natural foods. For instance, the Golden Rice contains the beta-carotene was introduced in the developing countries to address the problem of vitamin A deficiency that was common among the poor (Dawe & Unneyehr, 2017). The golden rice had more nutritional value than the traditional rice, and it led to the increase in food security. The development of genetically modified rice would help address the threat caused by a deficiency of vitamin A; it also complements the vitamin A pathway. Genetically modified food also has nutraceutical value with the special traits which help in the prevention of disease. One case in which genetically modified crops are used as medicinal is a tomato with increased lycopene which helps in the prevention as well as treatment of prostate cancer and some conditions of the heart. The alpha-glycinin found in the soya bean protein has been found to have anti-hypertensive properties prevented the development of such which can lower the blood pressure in hypertensive animals in the laboratory. Research has it that genetically modified bacteria can act as a barrier for the protection of women against HIV infection. The genetic modification of the *Lactobacillus jensenii* has led to the secretion of CD4 that blocks the laboratory strain HIV hence making it incapable of infecting human beings.

It has led to an improvement of the quality of animal feeds.

There is a rise in demand for animal products like milk and meat across the world caused by the increasing human population, currently approximated at 9 billion.

In turn, there has been needing to enhance the production of animal feeds so as to guarantee sustainability in this area. There are several measures put in place in response to the looming shortage that is threatening human survival. One such strategy has been the adoption of genetically engineered animal feeds. Since its inception in the 90s, the technology has resulted in an increased production of animal feeds. The additional yields gained after embracing GE technology is approximated at 195 million tons for corns and 110 million tons for soya beans. Other advantages that have come with the use of GE technology in producing animal feeds includes reduced use of insecticides and a rise in the quality of such feeds (Van, 2013). Insecticides are not friendly to the environment because they have a long-term poisoning effect hence their replacement with GMOS has been a relief. The GMOS have an inbuilt resistance to diseases as well as viruses which may otherwise attack animals. Some of the developed traits may also be resistance to insects and herbicides. Apart from being environment-friendly, it has also helped farmers cut on the cost of producing animal feeds, and this translates to higher profits. The long-term result has been an improvement in the living standards of people across the globe. Research shows that there is a future potential increase in nutritional value in some of the plant traits as well as the durability of the crops produced using the GE technology.

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Horticultural benefits of GMO

The GMO have created a significant impact in the horticultural sector. Some of the challenges that are faced by farmers producing horticultural crops include; lack of storage facilities. Horticultural crops are highly perishable by nature hence required the farmers to have special storage facilities' the adoption of genetically modified organisms has helped address some of these challenges.

For instance, the problem of transportation has been dealt with by the production of sustainable crops which are resistance to spoilage. The shelf life of the genetically engineered horticultural produce is also longer hence an answer to the threat of perishability in stores. The period between planting and harvesting had been too long for some crops, and at the time of harvest, the yield was small as some were destroyed in the fields. Farmers registered losses as a result, and those who embraced genetically engineered crops experienced a paradigm shift regarding the quality and quantity of their produce (Wendelkin, Anthony, & Herman, 2017). Their soils have also maintained fertility since the poisoning effect of pesticides and herbicides is eliminated. The waiting time has also been cut on since genetically modified foods grow and mature faster than the non-modified ones, thereby raising the sustainability levels of foods within economies. The consumers of GEC also benefited from this technique of farming since they can gain more nutrients. These nutrients which may be stress tolerant are introduced in the GMO. Genetically modified trees, such as the poplar tree, has been amended in such a way that it reduces on soil pollution by eliminating heavy metal ions from the ground.

Conclusion

Despite the numerous advantages that accrue to the users of GMOs, the subject has met a lot of criticism from some quarters. They argue that the GMO are not safe for human consumption. This belief is pegged on the idea that consumption of the GEC can cause the development of some disease which is resistance to antibiotics and the consumer is also exposed to more danger of developing cancer. These GE are new inventions which mean people have minimal knowledge about them hence the risk of long-term effect may not be known. However, studies have revealed that the products are not only safe for human consumption but also contain nutrients builds on the health of people and animals that rely on them for survival. Their production involves a lot of research and testing with the aim of raising their efficacy and efficiency (Morris, 2011). For example in the United States of America, some specific laws and procedures regulate investment in this area of food production. The guidelines dictate for the repeated and extensive testing of the genetically engineered produce to ensure the safety of the environment and human consumption. The final test is reviewed by the Food and Drug Administration, the department of agriculture and also the US environmental protection agency. A report on the impact of genetically engineered organisms on the environment, human health and agriculture revealed higher crop yields, reduction in the application of insecticides and the herbicides and improved quality of animal products. The artificial food also carries medicinal value and has helped in the treatment of conditions such as those of prostate cancer and night blindness. I believe that genetically modified foods have more advantages than disadvantages and should, therefore, be produced in larger quantities.

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