



The Impact of Genetically Modified Organisms on Food Production and Public Health in the United States

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Imagine a world where crops and animals were engineered to feed people around the world, solving poverty issues and increasing food production, but there were also potential links to cancer and birth defects. Would you take that risk? “A GMO, or genetically modified organism, is a plant, animal, microorganism, or other organisms whose genetic makeup has been modified in a laboratory using genetic engineering or transgenic technology” (“Future”, par. 3). Not long ago, during the late 20th century, the Green Revolution was in full motion, agricultural innovations were invented to expedite food production. Crop improvements, especially through plant breeding, led to a significant 40% increase in yields (Pimentel, par. 3). The Green Revolution was the reason billions of people around the world had enough food to feed their families. According to the United Nations (UN), the global population is expected to grow from the current 8.025 billion to 9 billion people by 2050 (UN). The question ‘How does the use of GMOs in produce production impact people within the United States of America?’ will be examined through a scientific perspective. This involves exploring the effects of genetically modified organisms from a negative and positive perspective, addressing the risks and benefits of GMOs.

From a negative perspective, there are a number of health risks that come with consuming GMOs including major links to cancer, birth defects, and shorter lifespans. Gina L. Nick, NMD, a world-renowned Naturopathic Physician and researcher, explained how “research has demonstrated that rBGH increases insulin-like growth factor (IGF-1) in milk by approximately 80%. This growth factor is orally active and is a key contributing factor to the incidence and onset of endocrine-related cancers in humans”(Nick, par. 4). Given this information, we can conclude that the association between excess blood levels of IGF-1 corresponds directly with cancer. 40% of the American diet is made up of dairy products, the majority deriving from cows injected with rBGH leading to elevated levels of IGF-1. Nick defines the hormone “rBGH, also known as rBST, [a] recombinant bovine growth hormone, and recombinant bovine somatotropin, a genetically engineered growth hormone used to increase milk production in cattle”(Nick par. 3). IGF-1 is recognized in its role of promoting the progression of cancer, more specifically endometrial tumor cells, central nervous system tumors, primary colorectal tumors, thyroid papillary cancer cells, etc. The European Union, Canada, Australia and New Zealand have banned rBGH. The use of genetic engineering in the food industry aims to enhance and stabilize overall production, but at what cost? There is an increased level of virulent bacteria in cows and a genetically engineered hormone that can cause cancer. S. J. Khan, a professor at the University of New York, has authored research papers that have collectively received 24 citations describing how, “[a]s we ingest transgenic human/animal products there is no real telling of the impact on human evolution. It is reported rBGH in cows causes a rapid increase in birth defects and shorter life spans”(Khan, par. 18). Given the evidence, we can assume that injecting cows with rBGH might be the only risk to genetically modified foods, but there have been many more cases. In 1989, many Americans died, and thousands were affected and impaired by a genetically altered version of food supplement L-tryptophan. Genetically modified foods have significantly low levels of important



nutrients that an individual's body needs to fight the body from diseases. No matter how hard people try to eat as healthy as possible, achieving it is becoming progressively difficult. The human diet is being altered, whether the people in the United States of America agree with it or not. Many people have little to no knowledge of the long-term health effects of the food they consume today (Hossain, 1). The media has largely downplayed and ignored any health concerns related to genetically modified foods. If individuals genuinely wanted to understand what they are really eating, it could take them hours of research, only to find little comprehensive information.

On the other hand, GMOs can lead to reduced environmental damage while feeding a growing population efficiently. Christina Holmes, a medical anthropologist who has done research on the social implications of biotechnology explains how "[this] argument postulates that technologies are ethically justifiable if their benefits outweigh risks...the promise is made to grant funding agencies, to the public, or to the venture capitalists that the technology will increase food production, assist the developing world, and increase agricultural sustainability"(Holmes par. 25). Based on this information, we can conclude that genetically modified organisms (GMOs) may not be as harmful as they are perceived. While there are concerns about the potential for allergies or the introduction of pesticide-producing genes, GMOs have an essential role in ensuring a guarantee of food around the world. Because of the Green Revolution and advancements of crop yields, billions of people have access to more food. GMOs contribute significantly by helping to reduce food shortages and counter malnutrition, benefiting people around the world. Genetically engineered crops are also resistant to drought, pests, diseases, allowing them to live in harsh conditions. David Pimentel, Ph.D., a distinguished professor of ecology and agricultural sciences at Cornell, describes how, "organic farming technologies also offered the advantage of avoiding applications of insecticides and herbicides, whereas conventional corn production uses more insecticides and herbicides than any other crop grown in the United States. Organic approaches would reduce the use of fossil energy in corn production by about 30 percent and substantially increase the organic matter in the soil"(Pimentel par. 7). The main objective of genetic engineering of crops is to increase food production while also enhancing nutritional value for much needed health benefits. Conventional crop production typically relies on higher amounts of pesticides and herbicides compared to biotechnology (GMOs), which reduces the need for such chemicals. This goes to show that organic farming could pose risks to human health, making it potentially more harmful in certain scenarios than genetically modified crops. Pimentel says "grains were developed, farmers might have to replant only once every five or six years. The use of biotechnology would be especially beneficial for many farmers in developing countries, who currently may have to spend more than 400 hours per hectare hand-tilling their fields before planting their crops" (Pimentel, par. 6). According to the World Health Organization (WHO), 3.7 billion around the globe are living in poverty and facing starvation due to their low nutritional and insufficient caloric intake (WHO). Grains play an indispensable role in this issue because they provide a large portion of calories needed for a healthy diet. Grains are annual crops, so the soil needs to be replanted and tilled every year, this process uses a substantial amount of energy and fossil fuels while also eroding the land. Biotechnology offers a solution by potentially saving farmers hundreds of hours spent on tilling and planting grains. Overall, Genetically Modified Organism's resistance helps accelerate food production, supports global development including a growing population, and aids the fight against hunger and instability throughout the globe.

Our world faces challenges every single day, but the most severe are social and



agricultural challenges. Including soil erosion, the overutilization of fossil fuels, and widespread hunger. With an increasing population, people everyday struggle to eat enough food. Among these issues, a wide range of opinions on GMOs have become the topic of intense debate. There are many advantages that come with using GMOs, but the major benefits are reduced time to produce food and lower costs. Natural agriculture uses more pesticides and chemicals which harms the environment and could harm people that are consuming those foods. Lastly, GMOs are resistant to harsh conditions which normal organisms are not, so food production will be increased once again. After the invention of genetic engineering, the world suppressed global issues that they were facing including feeding an increasing population, use of chemicals on plants, and reducing the footprint of agriculture.



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