

Student's Name

Professor's Name

Course

Date

### **The Impact of GMOs on Human Health and the Environment**

The issues of climate change and global warming have been posing a threat to the current sustainability of food in the ecosystem. Drought, flooding causing waterlogged soils, erratic weather shifting harvest patterns, and longer growing seasons that cause pest pressures have all impacted agriculture. Ironically, the food system production contributes further to the greenhouse emissions that escalate the climate change crisis. However, while humans must eat to survive, they should consider their dietary choices' impact on their bodies and the environment. In *Climate Crisis at the End of Our Fork*, Anna Lappe, a food writer, explains how food choices affect the environment, animal welfare, and human health (854). She argues that the main problem with this technology is how it impacts human health, the environment, and animal welfare. The term "genetically modified organism" (GMO) refers to plants or animals genetically altered through various biotechnology methods to improve their quality or quantity production. Despite being a solution to food security, GMO products do not have a healthy and sustainable impact on human health and the environment.

GMOs, unlike traditional seeds, cause harm to the environment by increasing herbicide use, introducing pesticides, and causing climate change. Lappe explains how GMOs affect the environment by discussing how GMOs increase pesticide applications, cause increased pesticide resistance, and change the ecological niche for non-target species (854). GMO crops require pesticides because of the pests that affect the crop. The increased use of pesticides increases pesticide resistance in these pests due to overuse. Pesticide application affects the ecological niche of non-target species by increasing toxicity levels,

changing the living conditions for these species, and removing their habitats. Some GMOs produce insecticides to protect crops from pests and weeds. However, this has led to an increase in herbicides, which are known to be dangerous to the environment.

GMOs also cause climate change. Climate change results from releasing carbon dioxide and other gases from burning fossil fuels. GMOs produce a greater quantity of carbon dioxide in comparison to traditional farming, contributing to the increase in greenhouse gas emissions and climate change. Agricultural activities facilitate the release of carbon dioxides. However, the primary use of GMOs is for industrial purposes such as food production, pesticides and herbicides, and the production of crops for biofuels. The increased use of pesticides and herbicides causes more damage to soil structure, which increases erosion rates. Erosion rates from herbicides lead to increased transport distances in water systems, further contributing to climate change. GMOs also increase the release of CO<sub>2</sub>, which causes greenhouse gas emissions from deforestation and fossil fuel burning.

Lappe also discusses the environmental impact of GMOs on soil fertility and how they disrupt natural seed diversity. Affluent nations have direct access to GMO seeds after crop development, leading to monocultures. The result is significant adverse environmental impacts, such as loss of biodiversity, which is crucial in maintaining a healthy ecosystem.

Using GMOs in agriculture may pose potential health risks to humans and livestock through chronic diseases and infertility issues. The use of pesticides on farms may create toxic chemicals in the soil that may accumulate in humans over time, with the potential to cause chronic diseases such as cancer. Glyphosate is one of these chemicals known to cause breast cancer and leukemia. The toxic chemical may enter the bloodstream through food and create various effects on the body, including changes in hormone levels. It may also affect DNA and disrupt the endocrine system. In addition, a change in food preferences has also caused a decrease in demand for some GMO products. People have raised ethical concerns

about using GMOs due to their effect on the food supply and their potential to cause organ damage, infertility, and cancer (Bawa and Anilakumar 1037). There are several issues with mandatory GMO labeling, including potential data protection violations, food supply contamination, and public health and consumer protection issues.

Crops which are genetically modified also have the potential to cause animal welfare problems. The increased use of pesticides and herbicides on farms may adversely affect the animals used for food products. For example, using GMO crops and herbicides on farms exposes livestock to excessive pesticides. Such exposure can cause toxic chemicals within the animals, which can be transmitted to humans through food. Animals are also exposed to high levels of herbicides which can decrease their ability to resist diseases, impeding growth and breeding processes (Saxena 10). In addition, farmers use antibiotics and vaccines on livestock because they feed on food that may harm them. The use of these substances may create side effects such as viral resistance and antibiotic resistance among livestock. In addition, the birth rate in livestock has been increased using GMO crops because it reduces the natural selection of animals which causes inbreeding problems with increased infertility. Moreover, large-scale farming operations have driven many species toward extinction. GMOs have also disrupted the ecological niche of many other species previously unaffected by chemicals and introduced new threats by changing the nutritional needs and habitat of non-target organisms.

GMOs can solve world hunger by increasing food production since modified crops have higher nutritional value than non-modified crops. Furthermore, there is no evidence that GMOs adversely affect human health. The World Food Summit was held in Rome between 1986 and 1996. The conference's main task was to bring all countries together and attempt to find a solution to food insecurity (Berry et al. 2295). It is an issue that has plagued the world for years, with many nations spending vast sums of money and resources to solve the

problem. Food distribution seems to be out of control due to natural and artificial factors.

Climate change, population growth, and income increases will increase the demand for food. However, agriculture is under pressure from water shortages, land degradation, and pests, yet the area of land devoted to agriculture is still increasing in many developing countries. The way forward is not to ban genetically modified organisms; instead, scientists must work together to develop a consensus to improve genetic engineering technologies in the future. Using these products has many benefits to improving the quality of human life, but using GMOs will require appropriate management. Studies seem to show that GMOs provide more benefits than harm and that these improvements can help reduce food insecurity for the citizens of developing countries.

The consumption of genetically modified organism (GMO) products has recently been a controversial topic among the public and government officials. While some argue that genetically modified foods have hurt consumer health and the environment, others believe that genetically engineered crops can help solve food shortages, provide excellent resistance to disease, and reduce the need for pesticides. Extensive media coverage fuels the debate between the two sides, conflicting studies presented as evidence, and polarized arguments about GMOs' benefits or risks. Many consumers have been changing their buying behavior, buying only non-GMO products. Animals such as cows, chickens, pigs, and fish are genetically altered to increase the production of milk, eggs, meat, and fish to meet the demand of global markets; however, this may lead to unethical business practices.

Ironically, factory farming methods, including using GMOs, have led to positive changes in the meat and dairy industries, such as the ability to produce more quality products. Some critics claim that genetically modified crops have more benefits than risks. They believe that GMO foods have the potential to help farmers produce more and reduce the use of pesticides. However, for consumers who refuse to purchase GMO foods, farmers are

forced to use antibiotics in cattle feed that may harm human health. However, critics failed to consider the adverse effects of mono-cropping and intensive farming, leading to a decrease in biodiversity and an increase in pests. The growth of GMO consumption is also not sustainable and may lead to severe consequences for humanity in the future. The promotion of GMOs has not been the most sustainable solution for world hunger issues. Over the years, many different food production technologies have been considered, including improved irrigation systems and fertilizer use, adding more land for farming, and expanding international trade to import or export more products. Governments must find alternative ways to reduce hunger and improve other farming technologies.

In conclusion, GMO products do not have a healthy and sustainable impact on human health and the environment despite being a solution to food security. GMOs harm the food supply regarding, the environment, animal welfare, and human health. GMOs only increase the use of pesticides and herbicides and decrease soil fertility, leading to erosion rates and climate change. Consumers are becoming more aware that their food choices significantly impact their health, economy, and environment. Most countries have regulatory systems that require genetically modified food and GM livestock to be tested before they can be marketed and sold. These regulation systems protect public health and the environment and ensure that these products are safe for human consumption and do not harm the environment or other organisms. Governments must work together to implement successful policies that could ensure future food security for their citizens.

### Works Cited

Bawa, A. S., and K. R. Anilakumar. "Genetically modified foods: safety, risks and public concerns—a review." *Journal of food science and technology* 50.6 (2013): 1035-1046.

Berry, Elliot M., et al. "Food security and sustainability: can one exist without the other?." *Public health nutrition* 18.13 (2015): 2293–2302.

Lappé, Anna. "The climate crisis at the end of our fork." *Sustainable Table*. October 2009.

Saxena, Gaurav, et al. "Genetically modified organisms (GMOs) and their potential in environmental management: constraints, prospects, and challenges." *Bioremediation of industrial waste for environmental safety* (2020): 1–19.