Genetically Modified Organism

Ali Endris

English Department, Anoka Ramsey Community College

English 1121-25

Professor McCarthy

November 9, 2023

What comes to your mind when genetic modification is mentioned? Do you see it as a promising technology for the future? Or something more intimidating? In the article “Why we are against GMOs,” by Slow Food (n.d.) states, “Little is understood yet about the health effects of GMOs, but recent studies have shown animals fed with GM-containing feed can develop health problems.” As someone who had similar concerns before my research, I understand this group's concerns, but should they be worrying about it? No! Genetically modified organisms (GMOs) are safe and have been tested countless times. Myths of GMOs stem from misinformation, some of which being that GMOs cause cancer, GMOs haven't been researched thoroughly, they are bad for the environment, and they were invented to benefit corporate businesses and they are degrading farmers. The reduction of such myths can not only help us improve our agriculture, but it can also help reduce poverty around the world.

According to the *YouTube* interview, “What Are GMOs? Purdue Talk with Agriculture Professor Dr. Rick Meilan” by Purdue University (2016), genetically modified organisms (GMOs) refer to the changes made in the DNA of any organism (all living things). He later goes in depth and explains that GMOs are living beings that have had their DNA modified, this includes bacteria that have been modified to cure diseases or vaccines that have been altered to prevent diseases. According to the article “GMOs: good or bad? History and Science” by Camilla Molinari (2023), the origin of GMOs dates to Circa 8000 BCE in the form of traditional modifications like selective breeding. This is when two parents with specific characteristics are bred together to get their desirable traits. The GM we know today was made by Biochemists Herbert Boyer and Stanley Cohen by inserting DNA from a certain bacterium onto another. Molinari (2023) later explains that modern genetic modifications were made to supplement the weakness of selective breeding; time. GM generates the desired traits precisely and quickly

unlike its predecessor. As such, GMs aren't just limited to their agricultural usage, animals have also been GM to better fit their desired environment. For example, cows have been genetically modified to make more milk, have better resistance to diseases, and even produce more beef.

One misconception is GMOs are bad for the environment. More specifically GMO is bad for biodiversity. In nature, biodiversity is made up of a food chain and an increase or decrease of a certain organism can have a negative effect on the whole food chain. Further information is given in the article "What are Invasive Species?" by National Invasive Species Information Center, "Non-native species are plants and animals living in areas where they do not naturally exist … Invasive species can lead to the extinction of native plants and animals, destroy biodiversity, and permanently alter habitats." Research such as this proves any addition to the environment can be considered bad, meaning both GMO and non-GMO plants or animals can be seen as harmful to the environment. The argument that GMOs are bad for the environment also comes from GMOs usage of herbicides. But the usage of herbicides isn't strictly used by GMOs, non-GMO based practices also tend to use herbicides and are just as bad for the environment. In contrast, GMO use less herbicides, this is seen in the article "Why do Farmers in the U.S. Grow GMO Crops?" by Food and Drug Administration (2022); "The three most common traits found in GMO crops are: 1. Resistance to certain damaging insects 2. Tolerance of certain herbicides used to control weeds 3. Resistance to certain plant viruses." Their resistance to herbicides used to control weeds and their resistance to certain plant viruses allows for a decreased usage of herbicides. Therefore, GMOs have more beneficial factors than regular practices while not having any added side effects besides ones that can't be prevented. According to Zurich, a website that publishes research-based articles, "Converting land to agriculture doesn't just destroy natural ecosystems such as prairies, grasslands and forest, it also deprives wildlife of the

food sources and shelter they depend upon to survive. Beyond the destruction of ecosystems, the intensification of farming is also driving biodiversity loss". Explaining the very usage of land to grow crops is bad, thus proving it's not the GMO that causes harm but crops in general. Overall, agriculture isn't good for the environment; practices performed by GMOs aren't different from non-GMO practices.

Another myth regarding GMOs is that they are not fit for human consumption. This is a widely believed misconception that comes from the lack of research people do on GMOs. Researchers around the world have done countless research proving that GMOs are safe and are for human consumption. But groups like Slow Food argue otherwise, "In many parts of the world including the EU, studies on GM crops can be carried out by the same companies who product them, casting doubt on the quality and bias of data." By this statement, Slow Food (n.d.) **i**s doubting the validity of the data done on GMOs. Research posted by articles like "Debunking the 9 Most Common Myths About GMOs" from Life Sciences Intelligence, Kaylor (2023) argue otherwise, "Scientific studies and regulatory agencies worldwide have consistently affirmed the safety of GMOs for human consumption. In a comprehensive report published in 2016, the National Academies of Science, Engineering, and Medicine stated that GMOs are no more risky than conventionally bred crops". Hence, GMOs are good for consumption and let's not let our misconception block us from further development.

Further myths of GMOs claim that they cause cancer. This belief stems from the fact that GMOs involve the editing of genes and it's believed those changes affect you on the consumptions of GMOs. Like many other health misconceptions, this also has some research proving it otherwise. According to Kaylor (2023), "Agencies such as the National Academies of Science, Engineering, and Medicine, WHO, and the European Food Safety Authority (EFSA)

have all affirmed the safety of GMOs and found no evidence linking them to cancer. The Cancer Council has also declared no proven evidence of a link between genetically modified foods on the market and cancer risk". Therefore, GMOs don't cause cancer or any other bodily harm and are just as good as their non-GMO counterparts.

The last misconception of GMOs is that they are for the benefit of business. As mentioned before, GMOs have the same or even a greater benefit compared to non-GMOs. Like all the other myths, misinformation is spread, in the article "Farmers Abandoning GMO Seeds and the Reason Will Surprise You" from *The Cornucopia Institute*, Jennings (2014), "The cost of growing one acre of non-GMO corn was $680.95, the cost of growing an acre of GMO corn was $761.80 according to Aaron Bloom. That means it costs $80.85 more an acre to raise GMO corn. GMO seeds can cost up to $150 a bag more than regular seeds". But that's not completely true, GMO seeds do cost more but they make up for it by lowering the production cost and by producing more crops. According to *Economic Research Services* article, "Prices for genetically modified seeds have risen much faster than non-GM seeds", by Fuglie (2023), "Despite their higher cost, GM crop varieties have provided significant productivity gains for farmers, partly through higher yield, but also by lowering farm production costs. For example, GM traits for insect resistance reduce the need for insecticide applications". Meaning that GMO seeds might cost more but because they have more resistance and don't require as many repellants and herbicides, they are just as profitable as regular seeds. To sum it all up, GMO seeds are not just made to benefit agricultural business because they also benefit the farmer.

Throughout this essay I hope you have come to understand that GMOs are fit for consumption, they don't cause cancer, they aren't bad for the environment, and they aren't harming farmers. As our population is increasing, our demand for food will also increase just as

much. We should be on the lookout for potential answers to our problems and not let misconceptions we have developed through misinformation and disinformation block our path to a brighter future. After reading my essay I hope to have opened your mind about GMOs, they are the future, and we should accept them to further develop as a society.

Reference

Fuglie, K. (2023, June 28). Prices for genetically modified seeds have risen much faster than non-GM seeds. *Economic Research Services*, https://www.ers.usda.gov/data-products/chart-gallery/gallery/chart-detail/?chartId=106785

Food and Drug Administration (2022, February 17). Why Do Farmers in the U.S. Grow GMO Crops? *FDA*, https://www.fda.gov/food/agricultural-biotechnology/why-do-farmers-us-grow-gmo-crops

Jenning, D. (2014, January 23). Farmers Abandoning GMO Seeds and the Reason Will Surprise You. *The Cornucopia Institute*, https://www.cornucopia.org/2014/01/farmers-abandoning-gmo-seeds-reason-will surprise/#:~:text=Some%20of%20the%20interesting%20facts,bag%20more%20than%20regular%20seeds.

Kaylor, A. (2023, July 18). Debunking the 9 Most Common Myths About GMOs. *Life Sciences Intelligence*, https://lifesciencesintelligence.com/features/debunking-the-9-most-common-myths-about-gmos

Molinari, C. (2023, April 10). GMOs: good or bad? History and science. *The Royal Institution*, https://www.rigb.org/explore-science/explore/blog/gmos-good-or-bad-history-and-science

National Invasive Species Information Center (n.d). What are Invasive Species? *National Invasive Species Information Center*, https://www.invasivespeciesinfo.gov/what-are-invasive-species

Purdue University (2016, September 12). What Are GMOs? Purdue Talk with Agriculture Professor Dr. Rick Meilan. *YouTube*, https://www.youtube.com/watch?v=QiHreVTjS58&t=3s

Slow Food (n.d). Why we are against GMOs. *Slow Food*, https://www.slowfood.com/what-we-do/themes/gmos/why-we-are-against-gmos/

Zurich (2023, January 13). How does biodiversity impact food security? *Zurich*, https://www.zurich.com/en/media/magazine/2021/food-for-thought-what-biodiversity-means-to-you#:~:text=Converting%20land%20to%20agriculture%20doesn,is%20also%20driving%20biodiversity%20loss