

CBA 2 Science in Society Investigation

Do the disadvantages outweigh the advantages of Genetically Modified Food?

In this paper, I will be discussing if the disadvantages of genetically modified food outweigh the advantages of genetically modified food. In my first section I will explain what genetically modified food is. In the second and third section I will look at the advantages and disadvantages of genetically modified food. In the fourth section I will give my conclusion of the paper. In the fifth section I will give my opinion on the matter. In the sixth section I will tie my question into the topic: An Application of Science that has An Effect on Human Health and finally in the seventh section I will evaluate my sources.

1. What is Genetically modified food?

According to Piedmont Healthcare and World Health Organisation, genetically modified food (or GM food) is food made from plants or animals whose DNA has been changed through genetic engineering. Genetic engineering is the process of copying an organism's genes, for example, transferring DNA from other organisms. Genetically modified organisms can be called GMOs for short. GMOs are used to make food better for example, allowing it to grow faster, look better, taste sweeter or resist herbicides.

2. Advantages of genetically modified food

A. Improvement of health in developing countries

GM crops have better quality traits, such as higher nutrient content than organic food. This can improve the health in developing countries.

According to Matin Qaim who a Professor of International Food Economics 'Golden Rice' was one of the first GM foods made. It was made to have more Vitamin A than regular rice. A lack of vitamin A in developing countries where people have limited diets can lead to blindness, higher child mortality rates and rapid spread of infectious diseases.

Golden Rice can reduce health problems associated with vitamin A deficiency by up to 60% in rice-eating populations. Rice feeds 50 % of the world's population, so genetically modifying rice can reduce the lack of vitamin A in the people of developing countries.

Other GM crops with more mineral and vitamins than in organic food include corn, sorghum, cassava, and banana plants. These crops can also improve health outcomes dramatically in developing countries.

B. GM foods can last longer than non-gm food.

According to Itannia (a finance blog), GMO crops can be made to last longer once harvested, which makes it possible to extend the distribution life of the food product. That makes it possible to send healthy foods further around the world. That means locations which are

1. Chooses an interesting or novel topic and research

2. Considers information from both sides of the argument, although all the information is from the same source.

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experiencing food shortages can still receive affordable foods that can benefit the general population.

C. We could get medical benefits from GMO crops.

According to Itannia (a finance blog), 'Pharming' is a process that could possibly make certain proteins and vaccines much cheaper thanks to genetic modifications. This could be a better and cheaper way to provide vaccines as well as vitamins for us all.

D. Less land for more food.

According to Itannia (a finance blog), GMO crops can be made to produce bigger yields from the same croplands. The crop yields can potentially double when the transition from traditional crops to GMO crops is completed by local farmers.

E. GMO'S could be our most powerful weapon to save our earth

According to Itannia (a finance blog), The world eats 11 billion pounds of food every day. A UN estimate says that that we will need 70% more in 2050. This could be made by clearing more and more forest to make fields and pastures as well as using more pesticides. Or we could use the land we have right now by using GM crops.

3. Disadvantages of genetically modified food

A. Allergic reactions

According to bioexplorer.net and caloriebee.com, in humans, the number one most common side effect of consuming GM foods is allergic reaction. This happens when a certain protein/allergen in the GM crop enters the body and therefore causes an allergic reaction. Also new allergies could form because of the mixing of genes from two organisms. Transfer of disease is also a concern as some inserted genes come from bacteria and viruses.

B. There is more nutritional value in non-gm foods.

A study published in the journal Food Chemistry, has found that organic soybeans are far higher in nutritional components like healthy sugar, proteins, selenium, and zinc, as compared to genetically modified soybeans.

C. Pesticide resistant insects and pests

According to bioexplorer.net and caloriebee.com, Modified genes in engineered crops that resist pesticides can transfer to insects and pests, making them pesticide resistant. These super-organisms cannot be controlled easily so now farmers are forced to use harsher and harsher pesticides.

3. Considers information from both sides of the argument.

4. Presents information in a structured way using relevant scientific terminology. Although the structure is similar to one of the sources the sources is referenced and the information is written in the students own words.

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D. GMO crops can contaminate other fields.

According to Itannia (a finance blog), seeds are produced by GMO crops as well as any other crop. These GM seeds can be spread to other fields and contaminate them. If cross-pollination occurs, there is a poor outcome for both GM and non-GM crops

4. Conclusion

The advantages of modified food are:

- Can Improve the health in developing countries cost effectively.
- Genetically Modified foods can last longer than organic food.
- We could get medical benefits from the GMO crops.
- It takes less land to grow GM crops meaning less land for more food.
- GMO'S could be our most powerful weapon to save our earth

The disadvantages of modified food are:

- Allergic reactions can occur.
- There is more nutritional value in non-gm foods.
- Pesticide resistant insects and pests
- GMO crops can contaminate other fields.

5. My Opinion

In my opinion I think that advantages of genetically modified food **do** outweigh the disadvantages of genetically modified food because:

Genetically modified food can help save our planet as I have pointed out in point 6 (advantage). And has already helped with major malnutrition in developing counties (Golden Rice).

I stated in point B (disadvantage) that 'There is more nutritional value in non-gm foods', but the source only stated one type of crop, soybeans. This may not apply to other crops.

There is an easy solution to point D (disadvantage) simply just space out the different crops so they are not near enough to contaminate.

In point A (disadvantage), I stated that genetically modified food could cause allergic reactions. But peanuts, wheat, milk and a large number of other goods cause allergic reactions. This is not issue just associated with genetically modified food as it has already been an issue way before GM food.

5. Gives a justified personal opinion informed by research, linking information to the argument and using science explanations.

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Martina Newell-McGloughlin who is a Director, University of California Systemwide Biotechnology Research and Education Program (UCBREP), Co-Director, National Institutes of Health Training Program in Biomolecular Technology, Co-Director, NSF IGERT CREATE Training Program, and Adjunct Associate Professor, Department of Plant Pathology at the University of California-Davis states that 'GMOs are more thoroughly tested than any product produced in the history of agriculture. We use many methods to introduce desired traits – to try to get specific characteristics into our crops. With GMOs, they are thoroughly tested before any product is released into the marketplace. In all the risk assessments in over 15 years of field research and 30 years of laboratory research, there hasn't been a single instance where there was a health risk associated with a GMO product.' - 18/4/2018

6. What topic does my question tie into?

My question ties into the topic: An Application of Science that has An Effect on Human Health as:

- The food we choose to eat has major impacts for our health.
- Genetically modified food could possibly be the only food we eat in the future.
- GM food has already helped hugely with improved health in developing countries.
- GM food could possibly become our new medication in the near future.

7. Quality of my sources

All of my sources are relevant to my questions and they all explore genetically modified food. In instances where I have looked up just the advantages of GM food there may have been some bias. But in those sources, I have investigated and have concluded that they are all reliable and accurate. Most of my sources have been published in this year, 2018 as well as 2017 showing that they are recent, and the facts are unlikely to have changed since. Many of my references' authors are specialized in this area.

6. Positions the topic as science in society.

7. Considers the reliability and quality of the sources.

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References

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<https://www.helpguide.org/articles/healthy-eating/organic-foods.htm> -

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https://www.youtube.com/watch?time_continue=542&v=7TmcXYp8xu4

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<https://www.bestfoodfacts.org/gmo-human-health/>

http://www.who.int/foodsafety/areas_work/food-technology/faq-genetically-modified-food/en/

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<https://www.healthline.com/health/allergies/common-food-allergies>

<https://vittana.org/24-advantages-and-disadvantages-of-gmos>

8. Finds information from a number of sources and gives a complete reference list..

OVERALL JUDGEMENT



IN LINE WITH EXPECTATIONS