

DOI: 10.36648/1791-809X.15.10.894

## GMOs and Human Health: A Review Darwin M Salvador\*

Department of Health Science, University of the Philippines, Philippines

### Abstract

Technology is a gift to life. Its advances continue to develop very rapidly, that emphasizes the advances of new ideas and innovations that could even more enhance and improve current processes. Genetic engineering is one of the remarkable advancements which revolutionized the present community. Genetic engineering in agriculture sector resolved the problem of feeding the ever-increasing population to a certain bit. Using genetic engineering different varieties of plants have been developed that possess better agronomic characteristics, and crop improvement. This study used paper review to succinctly evaluate the adverse effect of Genetically Engineered Organisms (GMOs) for human consumption as well as its mechanism to lower forms of life. Published studies from 2016 to 2020 were gathered from reputed journals through the Google Scholar and PubMed. Currently, based on the review of the recent studies; genetically Engineered crops is not natural that can cause unusual disturbance to human micro biome that can lead to health problems directly or indirectly.

Moreover, the intensive modern agriculture based on GMO technology has unwanted impact to the different organism to the biodiversity.

**Keywords:** Genetic engineering; GMO technology; Human health; Crop improvement

### \*Corresponding author:

Darwin M Salvador

✉ dharwaynesalvador@gmail.com

**Tel:** 639100883241

Department of Health Science, University of the Philippines, Philippines

**Citation:** Salvador DM (2021) GMOs and Human Health: A Review. Health Sci J. 15 No. 10: 894.

**Received with Revision on:** October 12, 2021, **Accepted:** October 27, 2021, **Published:** November 03, 2021

### Introduction

Technology is a gift to life. Its advances continue to develop very rapidly [1], that emphasizes importance of new ideas and innovations that could even more enhance and improve current processes [2]. Not surprisingly, global development and advancement manifest in its application that revolutionized the present community and influence the field of Biology that brought development in the field. Singh et al. [3], genetic engineering is solely based on genetic information, which is encoded by the DNA in the form of genes; through genetic engineering the genes can be introduced or manipulated within the host to develop products of value and importance, for treatment of genetic disorders, and to achieve other goals. Genetic modification of an organism involves transferring DNA, the genetic component from a plant or bacterium, or even an animal, into a different organism [4]. It is a tool to speed up breeding for new varieties, which can help farmers and agricultural systems adapt to rapidly changing physical growing conditions, technology, and global markets [5].

Modern agriculture provides the potential for sustainable feeding of the world's increasing population [6]. Transgenic plants can produce better fruits and food of higher quality than

wild-types and can be used as bioreactors for the synthesis of pharmaceutically important compounds [7]. New advances in crop genetic engineering can significantly pace up the development of genetically improved varieties with enhanced yield, nutrition, and tolerance to biotic and abiotic stresses [8].

GMO technology continues to be surrounded by controversial debates involving different actors, including environmental pollution, unintentional gene alteration to wild plants, probable creation of new viruses and toxins, restricted access to seeds due to patenting of GM food plants, impedance to crop genetic diversity, religious, cultural and ethical concerns, as well as fear of the unknown [4]. In ethical terms, the biggest danger associated with the development of genetic engineering is a dehumanization of representatives of the species 'Homo sapiens' involving interference in its autonomy [9].

Genetically Modified Organisms (GMOs) as science incessantly achieves innovative and unexpected breakthroughs, new medical, political, ethical and religious debates arise over the production and consumption of transgenic organisms [10]. Modern biotechnology through genetic modification offers the additional tool for increasing crop productivity [11]. Thus, it is the master key of all the troubles related to living organisms whether

plants or animals. By genetically modified food means that food is no longer natural, it is the product of combining genes from different types of organisms [12].

## Significance

The study will provide an evaluation of the potential health risk concerning Genetically Engineered Organisms, one of the promising advancements in the field of agriculture to meet the demand of the growing population. Similarly, to assess its impact to lower animals, and provide awareness to the community in choosing a healthier meal on the table.

## Methodology

The study succinctly evaluates the adverse effect of Genetically Engineered Organisms (GMOs) for human consumption as well as its mechanism to lower forms of life. This study used paper review to find themes and inferences related to health risk as a counterpart of consuming the product of new trend in agriculture. Published studies ranging from 2016 to 2020 were gathered from the different scientific journals. Google Scholar and PubMed were utilized to easily collect the needed data. The collected data were analyzed to form the result based on the objectives of the study.

## Result

Currently, based on the review of the available studies; evidence show that Genetically Modified foods may have an unpredictable danger to the human health directly or indirectly. The modification of its deoxyribonucleic acid (DNA) that possibly contained antibiotic and pest resistant genes and the altered nutritional value may have an adverse effect to human health. Its modified trait designed to be pesticides-grown may bio accumulated through horizontal gene transfer from transgenic foods for consumption. Furthermore, the consumption of GE foods may lead to the disturbance to human micro biome. Its adverse impact in the human digestion resulting to digestive disorders can lead to other health issues. Other unintended effect may include allergen city, anti-nutritional effect, carcinogenicity,

and toxicity.

The development of modern agriculture can affect the lower form of life and can create disturbance in the ecosystem. Ingestion of genetically modified organisms increases the mortality rate among male rat. The intensive adaptation and propagation of the GMOs in agriculture will affect the native population of amphibians. The transfer of a resistant gene for plant defense becomes toxic to insect, pest and fungi. In this regard, insect population (including beneficial insects) will be decreased since their larval survivorship will be declined as their general health. Thus, studies found that GM crops have a negative impact both to the invertebrate and microorganism soil biota.

Moreover, genetically modified food is not a natural food for human; it undergoes several genetic alteration and modification. Since it's not a natural food, expect its unpredictable dangers to human health. Put in mind the widespread controversy of GMOs to human health and to the lower form of life, taking the risk is not advisable for this time. Promote organic farming and always choose organic foods for a healthier life.

## Discussion and Conclusion

A Genetically Engineered crops is not a natural food for both the human and animals. Its genetically altered traits for its resistance against to certain virus, insect and pest may have unpredictable danger both in the human health and to lower form of life in the biodiversity directly or indirectly. The ingestion of Genetically Engineered foods (horizontal gene transfer) may result to digestive disorders which can lead to several health problems. Therefore, it can create unusual disturbance in the human micro biome.

The intensive modern agriculture model based on the GMO technology may also have an unwanted impact to the different organisms in the ecosystem. The new technology in agriculture will continuously affect the population of the native amphibians; decrease the population of the male rats, insects including the beneficial insects and cause changes of the invertebrate and soil bacteria.

## References

- 1 Asy ari MKH, Rahman M (2020) Technology: Technological Advances and Changes in Human Lifestyles in a Socio-Cultural Perspective. Proceeding International Conference on Science and Engineering 3: 721-730.
- 2 Mikulic I, Stefanic A (2018) The Adoption of Modern Technology Specific to Industry 4.0 by Human Factor. Proceedings of the 29th DAAAM International. 0941-0946.
- 3 Singh TA, Singh T, Singh R, Gaur R, Pandey K, et al. (2020) Genetic Engineering: Altering the Threads of Life. Genetic Engineering - A Glimpse of Techniques and Applications.
- 4 Islam R, Parvin A, Billah MM, Islam M, Imran MAS, et al. (2020) Assessment of the Effects of Genetically Modified (GM) Foods: A Brief Study on Health and Environmental Concerns. J Mater Environ Sci 11: 1676-1688.
- 5 Zilberman D, Holland TG, Trilnick I (2018) Agricultural GMOs - What We Know and Where Scientists Disagree. Sustainability 10: 1514.
- 6 Tsatsakis AM, Nawaz MA, Tutelyan VA, Golokhvast KS, Kalantzi O, et al. (2017) Impact on environment, ecosystem, diversity and health from culturing and using GMOs as feed and food. Food Chem Toxicol 107: 108-121.
- 7 Kahl G, Winter P (1995) Plant genetic engineering for crop improvement. World J Microbiol Biotechnol 11: 449-460.
- 8 Kamthan A, Chaudhuri A, Kamthan M, Datta A (2016) Genetically modified (GM) crops: milestones and new advances in crop improvement. Theor Appl Genet 129: 1639-1655.
- 9 Probucka D (2018) Ethical Aspects of The Development of Genetic Engineering. Eur J Sci Theol 14: 69-75.
- 10 Papparini A, Romano-Spica V (2004) Public health issues related

with the consumption of food obtained from genetically modified organisms. *Biotechnol Annu Rev* 10: 85-122.

11 Nwosu OK, Ubaoji KI (2020) Chapter 17 - Genetic Modification as a

Control Mechanism to Plant Pest Attack. *Natural Remedies for Pest, Disease and Weed Control* pp: 203-208.

12 Rohillaa P, Jhab S, Yadavc YS, Sharmad H (2017) Possible Impacts of GMOs: A Review. *Int J Res Anal* 4: 2012-214.