Food and Agricultural Organisation

Research Report

The Question of:

The role of Genetically Modified Organisms (GMO) in achieving Zero Hunger (SDG2)

Introduction

Genetic modification exists since the 1970s. Since then biotechnology has improved significantly. The appearance of GMO food improved the lives of many and is a potential solution to eliminate world hunger. In spite of the improvements in this field, many have concerns whether GMO foods are actually safe and sustainable. Due to uncertainty in the effects of given GMOs on the environment, many oppose to the further use of GMOs. As a whole, genetic modification has its strengths and weaknesses, both in terms of environmental effects and human and animal health. One of the reasons why GMO is such a widely controversial issue is the fact that there is little knowledge available among the general populace.

The Committee

The Food and Agricultural Organisation was established in 1945. In the early decades of the committee it faced issues concerning hunger and malnutrition. Since then the aims have been broadened by other goals, namely in ways of making agriculture, forestry and fisheries more productive, reducing rural poverty, enabling inclusive and efficient agricultural and food systems, and increasing the resilience of livelihoods to threats and crises.

The Food and Agricultural Organisation has contributed to many achievements all around the world. The following are just a few examples of the work of the organisation.

- In 1963 Codex Alimentarius was established in order to ensure given standards of food, to protect consumers and to promote fair trade.
- Between 1974 and 2002, FAO worked on the eradication of river blindness in West Africa. A disease transmitted by infected flies has been eradicated by launching a programme, which provided eco-friendly insecticides with a large-scale treatment. This programme has saved millions of lives in Africa.
- In order to reduce the number of people in immediate need of food and nutrition in the region of Latin America and the Caribbean, the FAO made food more available by strengthening political commitment and promoting access to food and nutritional wellbeing.
- A deadly virus called rinderpest, which killed many cows and buffalos, was eradicated by a programme established by the FAO and the WHO in 1994.

Since the establishment of the FAO the organisation has supported many in need and promoted programmes that work towards a less polluted environment and towards a world where the essentials for a living can be provided for everyone.

The FAO follows the standard Rules of Procedure, which means it is *not* an ad-hoc committee.

Key Terms

Malnutrition: physical weakness and bad health caused by the lack of food or by having a lower amount of food than needed

Obesity: the physical state in which one is overweight in a way that it is dangerous to one's own health

Biodiversity: the variety of species in a given area

Genetic modification: the process of changing the structure of the genes of a living thing in order to make it healthier, stronger, or more useful to humans[1]

Domestication: The process of taming animals and the cultivation of plants

General Overview

Genetically Modified Organisms are produced by transplanting DNA from other living creatures in order to gain a more convenient type of plant or animal, which could help to reduce the work required on e.g. a crop field. Since the first GMO food on the market in 1994[2], genetic modification has been used in almost all industries, from oil to the medical industry. The future of genetic engineering has a great range of possibilities, including plant with superior resistance to viruses and bacteria and to drought and animals with enhanced growth.

Alteration of genes, called breeding existed before genetic engineering, including the domestication of farm animals and also the breeding of corn. Domestication of animals and plants began circa 10 000-11 000 years ago and now all principal food crops are a descendant of a domesticated variety. One of the most determinative events in history was the Green Revolution, which took place between the 1950s and the late 60's. It increased agricultural production mostly in developing countries through the introduction of new technologies and prevented many people from starvation.

By genetically modifying a given seed or plant, scientists can create a crop with preferred traits, such as the higher content of nutrients or more resistance to diseases. This could result in a decrease of pesticides and herbicides as well as a decrease of the manpower needed to farm a certain crop, such as Bt Corn, that produces a poison, which kills pests.[4]

Due to these factors, some believe that genetic modification will be the future of agriculture since it solves many issues. For example, enhanced seeds can boost productivity in regions where the conditions are poor, e.g. golden rice, which is artificially strengthened with Beta Carotene in order to help to decrease the number of those, who suffer vitamin deficiency. This could thus e nsure food in regions where famine is a serious problem, in other words it can help in achieving the elimination of world hunger.

Golden Rice

Despite the positive effects of these organisms, many oppose the idea due to the risk of health

problems, such as allergy. Some of the genes, which are used in genetic modifications can be from a material that may cause an allergic reaction and might transmit this trait to the altered e.g. plant.[3] Furthermore, researchers fear that genetic modification might lead to the creation of new allergens.[3]

Although, GMO production also aims to solve some of the environmental issues, such as deforestation, it might cause other problems in nature. By growing genetically modified crops, the ecosystem of that given area could be damaged, and by making crops immune to certain insects, it would lead to the extinction of a given species and the removal of an important part of the food chain. This could result in irreparable damage to the biodiversity. In North America, the number of monarch butterfly began to decline and it was due to the increased use of herbicide on herbicide-tolerant crops.[7] In summary, scientists cannot predict how a genetically modified plant or animal would affect its surrounding.

Another fear is that new diseases would appear because of GM foods. This is supported by the fact that often organisms are modified by the use of bacteria and viruses and this could lead to the creation of new diseases.[3]

In conclusion, genetically modified crops offer great potential for the future. However, there is still not sufficient research to ensure the safety of humans and the environment.

Timeline of Events

1973- Herbert Boyer and Stanley Cohen engineered the first successful genetically modified organism

1975- Asilomar conference of 1975

1980- U.S. Supreme Court allowed scientists from General Electric to use genetically engineered bacteria to break down crude oil

1982-the use of Humulin was allowed

1992-the first GMO food on market, Calgene's Flavr Savr tomato

1995-the first pesticide-producing crop was approved in the U.S.

Major Parties Involved

USA
The work of the United States Department of Agriculture, the Environmental Protection Agency and the Food and Drug Administration ensures that genetically modified crops are tested and studied properly in order to prevent any harm to consumers or to the environment.

European Union
The GMO Legislation has been established in order to ensure the protection of human and animal health, clear labelling and traceability.

Greenpeace
Greenpeace has been campaigning against the use of GMOs on the grounds of unpredictable environmental causes of GMOs in the future.

WHO
FAO/WHO Codex ensures the safety of GMO food in order to provide healthy food for consumers.

GENERA
Genetic Engineering Risk Atlas provides researches on the relative risk of GMOs.

Previous attempts to solve the issue

It has been mentioned that in the European Union and the United States some steps have already been taken. For example, in order to protect human and animal health safety, an assessment to ensure this safety was introduced.[5] Other important solutions are the transparent process, clear labelling and traceability. These help consumers to make a well-informed choice about the food they purchase.

The Future

The future of genetically modified organisms could be promising. Scientists now are focused on creating plants that are more and more resistant to diseases and to drought in order to support environmental protection, since by delivering these plants lower amount of water is required to be used and fewer amount of land is required to be cleared for new crop fields, thus this can be the solution to the issue of deforestation and to the lack of water in certain regions.
Moreover, the ideas and researches of genetically modified animals have emerged. These include creating disease-resistant pig and bird-flu resistant chicken. In Canada, the first genetically modified salmon was sold in 2017.[6]

Important Decisions a Resolution Must Take

The delegates may include in the resolution during the conference in November the necessity of education and other means in order to make people more aware of what genetically modified foods are and how they could be both advantageous and disadvantageous to us. The questions to answer might be the followings; where would it take place, who would hold it, how would it be available to everyone in terms of age.

Furthermore, it has been previously mentioned plenty of times in the Research Report that although the knowledge about GMO and genetic engineering has been improving since its invention, there is still a lot to be uncovered in this issue. While writing a resolution, delegates may think about questions, like again who would lead these researches and experiments, would it be a new organization or an already existing one.

Since GMOs are a potential solution to achieving zero hunger, the resolution might include a clause about how new technologies in genetic engineering should be spread to less-developed countries in order to promote the development of agriculture.

In conclusion, the presidency highly encourages all nations to be open and cooperative during the conference in November.

Further Reading

https://gmo.geneticliteracyproject.org/FAQ/where-are-gmos-grown-and-banned/

https://blogs.scientificamerican.com/observations/the-future-of-gmo-food/

https://www.forbes.com/sites/gmoanswers/2016/01/12/zero-hunger-with-biotechnology/#21b670596765

http://www.fao.org/food/food-safety-quality/gm-foods-platform/browse-information-by/country/en/

Bibliography

Source[1]: dictionary.cambridge.org
Source[2]: https://www.vox.com/cards/genetically-modified-foods/what-is-genetically-modified-food
Source[3]: https://www.vox.com/cards/genetically-modified-foods/why-would-anyone-want-to-make-gmo-food
Source[4]: http://www.geneticallymodifiedfoods.co.uk/fact-sheet-pros-vs-cons.html
Source[5]: https://ec.europa.eu/food/plant/gmo/legislation_en
Source[6]: https://blogs.scientificamerican.com/observations/the-future-of-gmo-food/
*Source[7]:*https://www.washingtonpost.com/news/wonk/wp/2013/12/03/why-are-the-monarch-butterflies-disappearing/?noredirect=on&utm_term=.b55753c7b531

http://www.geneticallymodifiedfoods.co.uk/fact-sheet-pros-vs-cons.html

https://gmo.geneticliteracyproject.org/FAQ/where-are-gmos-grown-and-banned/

https://blogs.scientificamerican.com/observations/the-future-of-gmo-food/

https://www.forbes.com/sites/gmoanswers/2016/01/12/zero-hunger-with-biotechnology/#21b670596765

http://sitn.hms.harvard.edu/flash/2015/from-corgis-to-corn-a-brief-look-at-the-long-history-of-gmo-technology/

http://ec.europa.eu/environment/integration/research/newsalert/pdf/64na3_en.pdf

https://ec.europa.eu/food/plant/gmo/legislation_en

https://www.greenpeace.org/archive-international/en/campaigns/agriculture/problem/genetic-engineering/

https://genera.biofortified.org/wp/

https://en.wikipedia.org/wiki/Green_Revolution

https://www.huffingtonpost.ca/steven-burton/gmo-foods-canada_b_5528366.html

LEMUN