Committee: Environment Committee

Topic: The question of the use of GMOs for global food security

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Summary

With a constant increase in the population, the question arises if we will be able to provide an adequate amount of sufficient and healthy food for everyone. Hence, methods such as selective breeding have been practised since approximately 8000 B.C.E. Thus, a wide variety of methods have been created to increase the supply of food, with an increase in demand. In1982, FDA approved the first consumer GMO product developed through genetic engineering: human insulin to treat diabetes (Science and History). Most nations have already now made the production of Genetically Modified Organisms legal and have allowed these products to be purchased.

However, GMOS are seen as controversial and must go through a complex risk assessment process, to verify that there is only a minor risk involved with the consumption. “Most of the GMOs authorised in the EU are used to feed farm animals, but some imported food might also contain them. The EU food labelling system obliges companies to indicate if the food or feed they produce contains GMOs. This applies when GMOs account for at least 0.9% of the food or the feed. Companies also have the option to indicate on a label that their product does not contain GMOs. (Eight things)”

In recent years, a multitude of concerns regarding GMOs have become known, such as but not limited to: “Genetic engineering allows, for the first time, foreign genes, bacterial and viral vectors, viral promoters, and antibiotic marker systems to be engineered into food. These genetic “cassettes” are new to the human diet and should be subject to extensive safety testing. Instead, in 1992 the U.S. Food & Drug Administration (FDA) ruled, without any scientific basis, that genetically engineered foods present no different risks than traditional foods. FDA’s own scientists ridiculed this unscientific agency's view of genetic engineering.(GE Food)” In other words, the concerns arise from the six major concerns, where significant amounts of evidence were found: Causing Cancer, Allergic Reactions, Antibiotic Resistance, Immunosuppression,

having severe amounts of Toxins, and leading to a decrease of nutrition levels contained in the product, if GMOs were utilised (GE Food).

Definition of Key Terms

GMOS - Genetically Modified Organism

Transgenic - “Transgenic refers to an organism or cell whose genome has been altered by the introduction of one or more foreign DNA sequences from another species by artificial means. Transgenic organisms are generated in the laboratory for research purposes. (Transgenic)”

CRISPR-Cas9 - “CRISPR-Cas9 is a unique technology that enables geneticists and medical researchers to edit parts of the genome by removing, adding, or altering sections of the DNA sequence. It is currently the simplest, most versatile, and precise method of genetic manipulation and is therefore causing a buzz in the science world. (What is CRISPR-Cas9?)”

Gene Silencing - “Gene silencing is the regulation of gene expression in a cell to prevent the expression of a certain gene. Gene silencing can occur during either transcription or translation and is often used in research. (Gene Silencing)”

Background Information

As previously mentioned, trying to increase the supply of food has been a concern, which has been present for a long time. However, genetics have been initially modified since approximately 1866, this is when an Austrian Monk, named Gregor Mendel, has successfully created a method of breeding two different types of peas. In 1922, the first genetically modified corn plants were produced and sold. In 1986. The US government Coordinated Framework for the Regulation of Biotechnology. This policy describes how the U.S. Food and Drug Administration (FDA), U.S. Environmental Protection Agency (EPA), and U.S. Department of Agriculture (USDA) worked together to regulate the safety of GMOs. In the 1990s the first wave of GMO produce created through genetic engineering became available to consumers: summer squash, soybeans, cotton, corn, papayas, tomatoes, potatoes, and canola. Not all are still available for sale (Science and History).

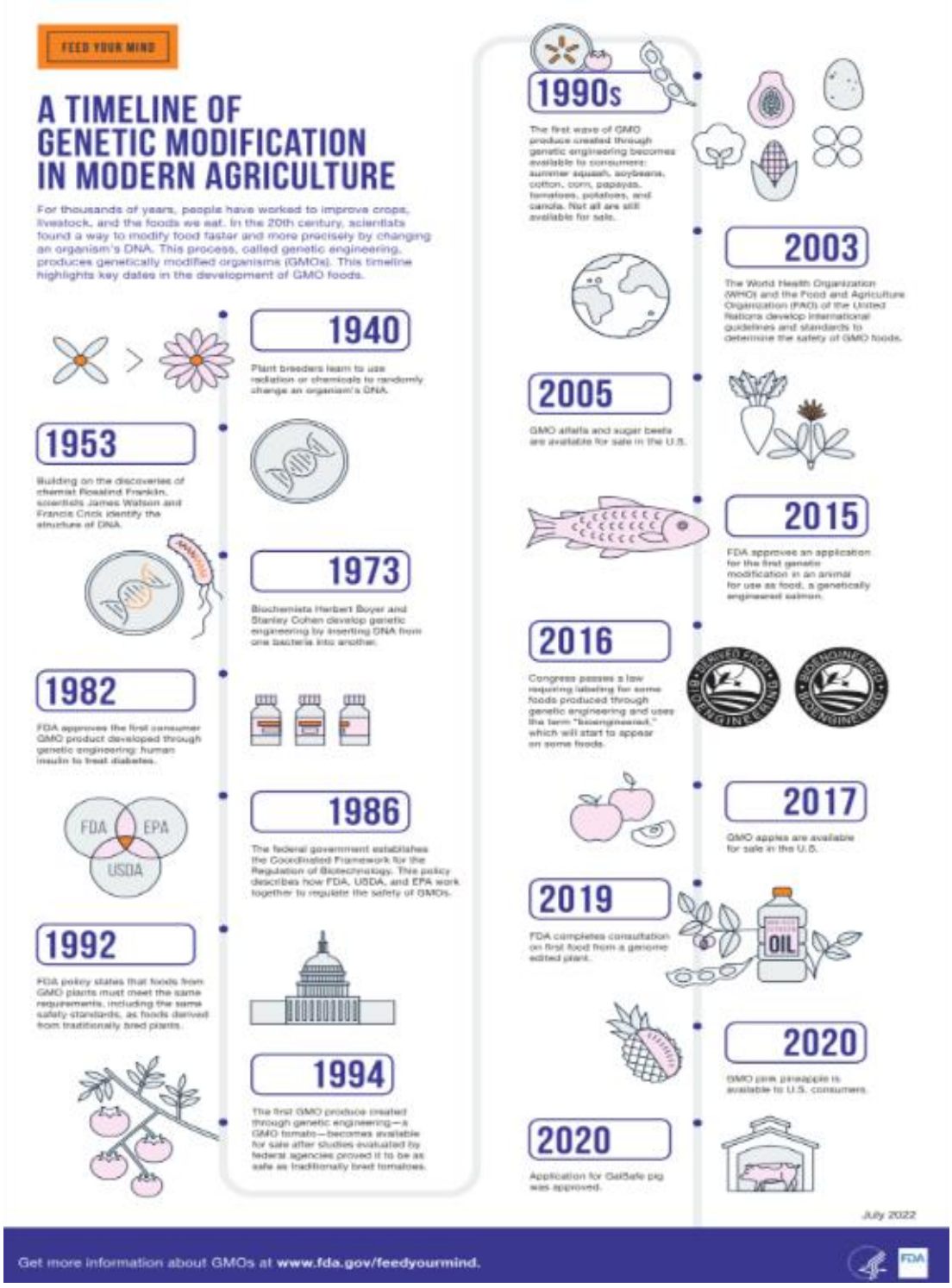
Major Countries and Organisations Involved

European Union- “Most of the GMOs authorised in the EU are used to feed farm animals, but some imported food might also contain them. The EU food labelling system obliges companies to indicate if the food or feed they produce contains GMOs. This applies when GMOs account for at least 0.9% of the food or the feed. (Eight Things)

United States of America - “The U.S. Food and Drug Administration (FDA), U.S. Environmental Protection Agency (EPA), and U.S. Department of Agriculture (USDA) ensure that GMOs are safe for human, plant, and animal health. (How GMOS)”

Peoples’ Republic of China - “The approved varieties are only allowed to be grown in designated areas, namely parts of Gansu, Inner Mongolia, Yunnan and Hubei, according to licences issued to the breeders published by the ministry of agriculture in December (6 Things)”

Timeline of Events



Relevant UN Treaties and Events

Geneva Convention

- "Key issues of concern for Parties and stakeholders with respect to access to information, public participation in decision-making and access to justice regarding LMOs/GMOs

- Challenges encountered in the implementation of the Aarhus Convention and its Almaty Amendment on GMOs, the Lucca Guidelines on GMOs, and Article 23 of the Cartagena Protocol on Biosafety as well as good practices and innovative tools to address them
- Opportunities for cooperation and capacity building
- Priorities for future work (GMOs)"

The Geneva Convention is the only current treaty, which is not outdated, and above are the key points summarised by the UN.

Previous Attempts to solve the Issue

Bearing in mind that GMOs are not necessarily considered an issue, some relevant parties involved, such as but not limited to the United States, believe that nothing more must be done. However, the European Union has been working on getting guidelines, which are acceptable to solve the issue, but they also want to ensure that all citizens get adequate amounts of nutritious foods.

The responsible government body of the United States has published research aiming to prove to people that GMOS are harmless. Whilst the European Union has published significant amounts of research stating otherwise.

Possible Solutions

1. Creating a clear consensus of all the information which was correctly gathered, and then work on getting all parties involved to agree on the further utilisation of GMOs
2. Potentially creating a task force, fully funded by the United Nations which will focus on the following
    a. How GMOs should be used
    b. To what extent the GMOS can be consumed
    c. A method to quickly distinguish if GMOs were used whilst manufacturing the product.

Bibliography

"Eight things you should know about GMOs." European Parliament, 27 Oct. 2015 www.europarl.europa.eu/topics/en/article/20151013STO97392/eight-things-you-should-know-about-gmos

"GE Food & Your Health." Center for Food Safety www.centerforfoodsafety.org/issues/311/ge foods/ge-food-and-your-health.

"Gene Silencing." Wikipedia, Wikimedia Foundation, 22 May 2024, en.wikipedia.org/wiki/Gene_silencing.

"GMOs." UNECE
unece.org/environment-policy/public-participation/gmos.

"How GMOS Are Regulated in the United States." FDA.com,
www.fda.gov/media/135278/download#:~:text=The%20U.S.%20Food%20and%20Drug,of%20GMOs%20on%20the%20environment.

"Science and History of GMOs and Other Food Modification Processes." U.S. Food and Drug Admistration, FDA.GOV, Mar. 2024,

www.fda.gov/food/agricultural-biotechnology/science-and-history gmos-and-other-food-modification processes#:~:text=1973%3A%20Biochemists%20Herbert%20Boyer%20and,human%20insulin%20to%20treat%20diabetes

"6 things to know about China's GM food development amid Beijing's food security push." South China Morning Post, 31 Mar. 2024, www.scmp.com/economy/china-economy/article/3257353/6-things-know-about-chinas-gm-food-development-amid-beijings-food-security-push

"Transgenic." National Human Genome Research Institute Home www.genome.gov/genetics-glossary/Transgenic

"What is CRISPR-Cas9?" Your Genome,
www.yourgenome.org/theme/what-is-crisprcas9/#:~:text=CRISPR%2DCas9%20is%20a%20unique,buzz%20in%20the%20science%20world.