World Health Organization

Global implications of genetically modified organisms: Progress or controversy?

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History of the Committee

The World Health Organization is the United Nations agency specializing in global health issues. It was created on April 7, 1948, to ensure that individuals worldwide can access optimal healthcare services, focusing on proposing policies related to disease prevention and health promotion and intervention. In particular, its establishment was driven by the need for an international body to address pressing public health concerns following the devastation of World War II. The WHO's constitution, initially signed by 61 countries, emphasized health as a fundamental human right and aimed to promote the highest possible level of health for every human being.

In its early years, the WHO concentrated on combating infectious diseases such as malaria, tuberculosis, and smallpox. One of its most notable achievements was the global eradication of smallpox in 1980–a result of an intensive vaccination campaign that began in 1967. The previous accomplishment demonstrated the efficiency of coordinated international health initiatives and solidified the organization's role as a leader in global health efforts.

Over the decades, the World Health Organization has expanded its scope of health concerns, including non-communicable diseases, mental health, and health system reinforcement. It also plays a crucial role in establishing international health standards and providing technical support to numerous countries. Specifically, during the HIV/AIDS pandemic, the H1N1 influenza pandemic, and the COVID-19 pandemic, the WHO has been instrumental in

disseminating information, guiding research, and coordinating responses to such health emergencies, illustrating its commitment to improving health services throughout the globe.

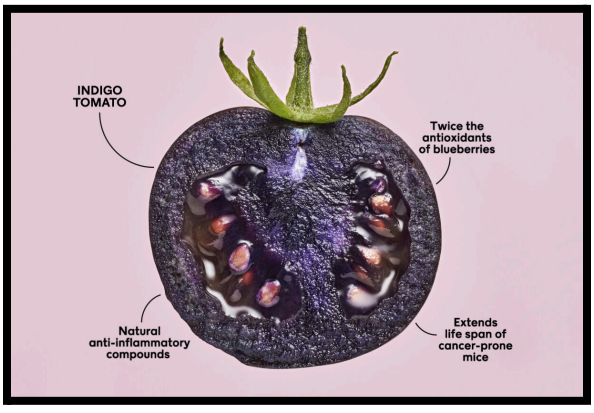
Moreover, the WHO has recently become involved in matters concerning genetically modified organisms, especially transgenic crops and recombinant DNA technology. These organisms are the products of genetic editing and engineering practices, considering their genetic material, otherwise known as their DNA, has been altered so that it does not occur naturally by mating or natural recombination. In particular, recombinant DNA technologies allow selected individual genes to be transferred from one organism into another, even between non-related species, giving rise to genetically modified foods or GM foods (WHO, 2014). Given the rapid pace of these scientific developments, the World Health Organization strives to address the ethical, legal, social, cultural, and economic implications of genetically modified food crops. The organization also collaborates with other international bodies and markets to regulate the production and consumption of GM foods, examining and evaluating their potential effects on public health to ensure their safety and protection.

Since 1948, such an agency has connected nations, partners, and individuals to promote health, keep the world safe, and serve the vulnerable for everyone, everywhere, to attain the highest level of integral health services (World Health Organization, n.d.). Currently comprising 194 member states, the WHO continuously leads efforts to expand universal health coverage, strengthening human healthcare and welfare.

Introduction

Genetically modified organisms are plants, animals, or microbes whose genetic material has been altered utilizing genetic engineering techniques to favor the expression of desired traits (National Geographic, 2023). Widely employed in research and food supplies, GMOs remain a subject of significant debate. The global public is questioning their safety and advocating for clear labeling of genetically modified products. Government officials and international organizations, including the World Health Organization, have also expressed concerns about whether adequate research has been conducted to qualify GMOs as safe for long-term utilization and consumption (National Library of Medicine, n.d.). Despite notable advancements in the field, questions persist: are genetically modified products ultimately beneficial for human health, or do they pose a risk of universal deterioration? These inquiries and uncertainties have driven countries to establish their own laws on GMO cultivation, importation, and exportation laws, resulting in varied and controversial national policies. These complex challenges underscore the significance of the WHO's ongoing debate on the global implications of genetically modified organisms and food crops, for the organization seeks to balance innovation with safety.

Historical Context



For thousands of years, humans have relied on traditional methods, including selective breeding and crossbreeding, to modify organisms and food crops. Early farmers developed techniques to

cultivate plants and animals with improved traits, such as corn with various colors, sizes, and uses. Similarly, modern strawberries were a cross between a species native to North America and another from South America. These products constitute a long history of breeding that has shaped the diversity of foods consumed nowadays. Nonetheless, traditional breeding can be a slow procedure, often requiring many generations to achieve specific changes.

In virtue of the aforementioned deficiencies in traditional breeding processes, Gregor Mendel, an Austrian monk, laid the foundations of modern genetic understanding in 1866 after discovering the basic principles of heredity through his experiments with pea plants (U.S. Food & Drug Administration, 2024). His work marked a turning point in plant breeding, providing a scientific basis for understanding how traits are passed down through generations. His knowledge and scholarly contributions gradually evolved, and by 1922, the first hybrid corn was produced and sold commercially, showcasing the practical applications of Mendelian genetics in agriculture. Furthermore, the 1940s witnessed further advancements as plant breeders began using radiation and chemicals to induce random changes in organisms' DNA, adding a new dimension to crop development.

A significant breakthrough in genetic engineering occurred in the 1970s. In 1973, biochemists Herbert Boyer and Stanley Cohen successfully inserted DNA from one bacterium into another, pioneering a method that allowed precise modifications in these organisms (Petruzzello, 2022). The previous event marked the advent of genetic engineering, enabling scientists to make targeted changes to DNA in a way that was originally unimaginable. Afterward, in 1982, the FDA approved the first consumer GMO product: human insulin,

developed with genetic engineering. Such an innovation revolutionized diabetes treatment and demonstrated the potential of genetic engineering to address health challenges.

Toward the end of the twentieth century, the 1990s brought the first wave of GMO produce to consumers, including summer squash, soybeans, cotton, corn, papayas, tomatoes, potatoes, and canola (U.S. Food & Drug Administration, 2022). These genetically engineered products showcased the ability to enhance food production and quality by introducing traits such as pest resistance and improved shelf life. In 1994, the approval of the first genetically engineered tomato for sale demonstrated that GMOs could be as safe as traditionally bred foods. Subsequent years saw the introduction of GMO crops like alfalfa and sugar beets. In 2015, the FDA approved genetically engineered salmon for human consumption, illustrating the expanding scope of genetic engineering.

The development and proliferation of GMOs have been accompanied by regulatory and safety considerations. In 1986, the federal government established the Coordinated Framework for the Regulation of Biotechnology, which ensures that the FDA, EPA, and USDA work together to oversee the safety of GMOs. International guidelines and standards have also been developed by organizations such as the WHO and FAO to address global safety concerns. While genetic engineering has offered innovative solutions to agricultural and medical challenges, it has also sparked ongoing debates about safety, ethics, and environmental impact. Despite these

challenges, GMOs have had significant and far-reaching implications, transforming agriculture and food production in notable ways (Bayer, 2023).

Current Issue

Controversies surrounding genetically modified organisms encompass environmental, economic, social, ethical, and political spectrums. These remain prominent issues globally: various stakeholders debate their impact on health, the environment, and agriculture. GMOs, which involve altering the genetic material of crops to achieve desired traits, such as herbicide resistance, have seen widespread adoption in major crops, including corn, soybeans, and cotton. Proponents argue that GMOs enhance crop yields, reduce reliance on chemical pesticides, and offer potential solutions for food security and biofuel production. However, critics raise concerns about possible health risks, environmental impact, and the socio-economic effects on small-scale farmers, who might struggle to compete with large agribusinesses employing GMOs.

A notable aspect of the debate on genetically modified products is the consideration of labeling and consumer choice. Several consumers and advocacy groups push for mandatory labeling of GMO products, arguing that people possess the right to know the components and biological processes involved in food production. In particular, research suggests that increased transparency, such as the mandatory labeling laws implemented in Vermont, can lead to greater public acceptance of GMOs. Conversely, the lack of labeling can exacerbate consumer mistrust, making it difficult for individuals to make informed choices (Whole Foods Magazine, 2008). The previous tension is reflected in divergent approaches worldwide, with multiple countries

embracing GMO technology more openly and others remaining skeptical and imposing strict regulations.

Moreover, differing opinions and discourses regarding GMOs are influenced by social media and misinformation. Recent studies indicate that automated accounts and bots have been used to amplify negative sentiments towards genetically modified organisms, potentially skewing public perception and augmenting polarization in related debates (Boyce Thompson Institute, 2022). Despite these pessimistic commentaries, the general trend in media coverage has been toward a more favorable view of GMOs, particularly in the United States of America, South Asia, and Africa– a continent where technological advancements are relatively new and thus, genetically modified products are perceived as promising tools for agricultural development. Such an evolving conversation underscores the international urge for balanced and evidence-based discussions to address the complexities of GMOs and their implications for society.

Past International Actions

Global regulations on genetically modified organisms have evolved over the past few years, reflecting diverse approaches by different countries and international bodies. The development and commercialization of GMOs have prompted significant international actions, as these organisms cross national borders, raising concerns about biosafety, environmental impact, and food security. Countries around the globe have adopted various regulatory frameworks based on their respective political, economic, and cultural contexts, leading to a complex and inconsistent system of GMO laws and standards worldwide.

On an international scale, one of the most prominent agreements regarding GMOs is the Cartagena Protocol on Biosafety, adopted in 2000 under the Convention on Biological Diversity (CBD). The previous protocol provides a framework for the safe transfer, handling, and use of GMOs, focusing on transboundary movements (Convention on Biological Diversity, 2024). It emphasizes the precautionary principle, allowing countries to restrict the import of GMOs that they believe may pose risks to biodiversity or human health, even in the absence of scientific certainty. Nowadays, over 170 countries have ratified the Cartagena Protocol, yet key GMO-producing countries like the United States have not, reflecting the ongoing debates over the interpretation and application of the specified precautionary principle.

Numerous other international standards and guidelines have been established, such as those developed by the Codex Alimentarius Commission, which is responsible for setting food safety standards globally. The Codex guidelines on GMOs, adopted in the early 2000s, provide principles for risk analysis and labeling of GMOs in food products. These guidelines are voluntary but serve as a reference point for national legislation and international trade, contributing to harmonizing different regulatory approaches and reducing trade disputes over GMOs.

Countries, on the other hand, have adopted varying approaches to GMO regulation. The European Union (EU), for instance, possesses one of the most stringent regulatory regimes, requiring extensive risk assessments and labeling of GMO products (Srour, 2022). In contrast, the United States adopts a more permissive stance, where GMOs are regulated under existing laws for food safety and environmental protection without mandatory labeling. It must be noted that according to a recent report on GMO statistics, approximately 75% to 80% of processed foods in the U.S. contain ingredients derived from genetically modified organisms; however, the products are not labeled (Dobric, 2024). The Latin American countries of Brazil and Argentina are distinguished for being major producers of GM food crops, adopting policies that encourage GMO cultivation, as they view it as crucial for their agricultural economies. Finally, other nations, particularly in African and Asian regions, have developed or are in the process of creating their own regulatory frameworks, often balancing the potential benefits of GMOs for agriculture and food security with concerns over biosafety and trade implications.

These diverging national and international approaches have occasionally led to global trade conflicts, considering countries with strict GMO regulations may reject imports from those with more lenient policies. Over the years, the complexity of global governance on GMOs has continuously highlighted the challenges of balancing scientific innovation with public health, environmental protection, and ethical considerations. As the debate persists, international organizations, especially the World Health Organization (WHO), play a crucial role in providing guidance, fostering dialogue and cooperation, and ensuring that global actions on GMOs are informed by the best available science and aligned with extended public health goals.

Subtopics

- GMO Labeling and Transparency Throughout the Globe
- Environmental Impacts of Genetically Modified Organisms
- GMO Trade and Global Markets
- Economic Disparities and Opportunities Rising From Genetically Modified Organisms
- Social, Ethical, and Health-Related Implications of GMOs
    - GMO Risk Assessment and Management

- GMO Biotechnology Education and Innovation Centers
    - The Role of Misinformation in Shaping Public Opinion on GMOs
- Roles and Regulations of International Organizations

Positions

I. United States of America: In the United States, genetically modified organisms are widely allowed and heavily integrated into the agricultural system. The U.S. government regulates GMOs primarily through three agencies: the Food and Drug Administration (FDA), the Environmental Protection Agency (EPA), and the Department of Agriculture (USDA). It must be noted that these are not required to be labeled, although voluntary labeling is permitted. Nonetheless, the USDA introduced a bioengineered food disclosure standard in 2020 that mandates certain products containing GMOs to be labeled as such. Genetically modified organisms are consumed frequently in the United States, with most corn, soybeans, and cotton grown being genetically modified. Multiple restrictions exist concerning environmental assessments and safety evaluations, yet overall, the U.S. maintains a favorable stance on GMOs.

II. Australia: Australia allows the cultivation and consumption of GMOs. However, it enforces strict regulations through its Gene Technology Regulator, which oversees the development and release of genetically modified organisms. GMOs in the country are subject to rigorous risk assessments before approval, and only certain crops, such as

canola and cotton, are approved for commercial cultivation. Furthermore, mandatory labeling of GMO food products is required when they contain novel DNA or protein or have altered characteristics. Even though they comprise a significant food sector, genetically modified organisms are not as widely consumed as in the U.S., partly due to consumer preference and the labeling requirement. Australian regulations ultimately aim to ensure the safety and transparency of GMO products.

III. Venezuela: On the other hand, Venezuela is distinguished by its restrictive stance on genetically modified organisms. These are effectively banned under a 2004 seed law prohibiting GM seed production, distribution, and import. Such a ban aligns with Venezuela's broader agricultural policies, emphasizing food sovereignty and biodiversity protection. Moreover, there is no legal framework for GMO product labeling, as their sale and employment are not permitted. Consequently, GMOs are neither cultivated nor consumed within the country, and the regulations strongly favor non-GMO, traditional agricultural practices.

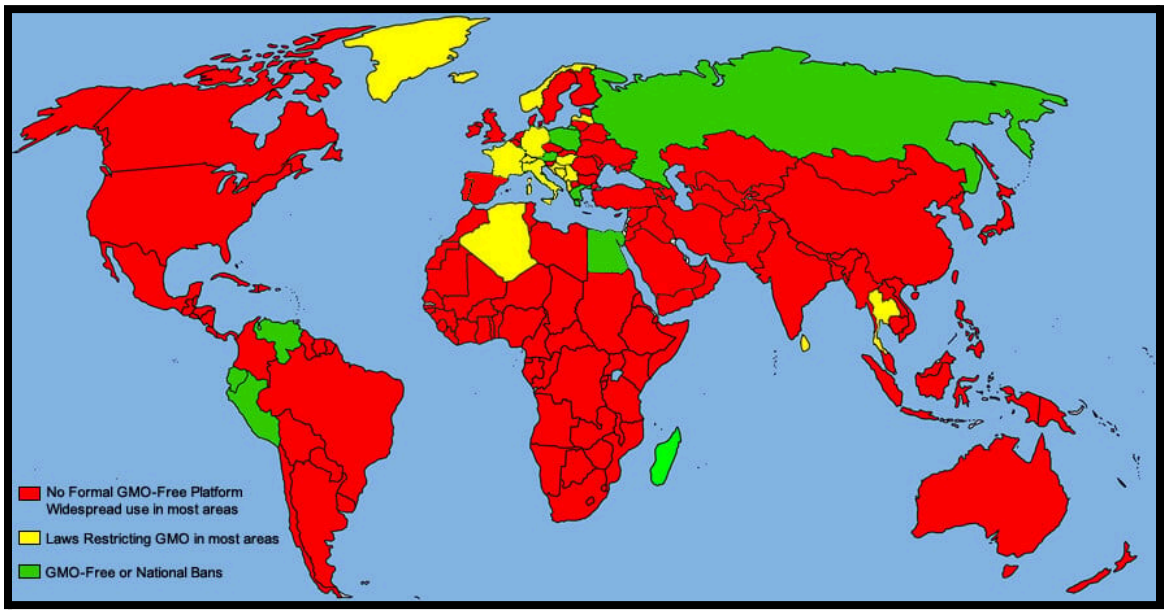
IV. Germany: Germany is cautious about GMOs, and their cultivation is effectively banned, although their importation for use in animal feed is allowed under strict regulations. The country adheres to European Union (EU) laws, which require rigorous safety assessments for GMOs and mandate the labeling of every food product containing more than 0.9% GMO content. It

has also imposed additional restrictions, including the use of "opt-out" clauses that authorize individual EU member states to prohibit GMO cultivation on their territory. As a result, genetically modified organisms are not widely consumed in Germany, and public opinion tends to be skeptical of their safety and necessity.

V. South Africa: South Africa is the only African country with significant GMO crop cultivation, allowing the commercial planting of genetically modified maize, soybean, and cotton. The country comprises a comprehensive regulatory framework governed by the Genetically Modified Organisms Act, which oversees the development, release, and commercialization of GMOs. Genetically modified organisms must undergo rigorous risk assessments before approval, and labeling is required for products containing more than 5% GMO content. GMOs are consumed frequently in South Africa, especially in staple foods, and the country is one of the top producers of GMO crops around the globe.

VI. India: Finally, India maintains a dual approach concerning GMOs, allowing certain crops while banning others. The only genetically modified crop currently approved for commercial cultivation in India is Bt cotton–a product widely adopted by farmers in the region. Nevertheless, the cultivation of GMO food crops, such as Bt brinjal (eggplant) and GM mustard, has faced significant resistance and remains banned. India's regulatory framework involves multiple agencies, including the Genetic Engineering Appraisal Committee (GEAC), which oversees GMO approval processes. Labeling of GMO

products is mandatory; however, enforcement is inconsistent. Genetically modified organisms are consumed, particularly in cottonseed oil, yet their overall prevalence is limited due to the ban on GMO food crops and public skepticism.



Guiding Questions

1. What is your delegation's stance on food production encompassing genetically modified organisms and similar biotechnologies? As the GMO debate is distinguished for its controversial character, how would your delegation approach GMO consumption health implications and ethical considerations to benefit nations throughout the globe?

2. How does your delegation approach the regulation and safety assessments of GMOs? Are current international guidelines sufficient to ensure global public health, and if not, what other measures does your delegation propose?

3. Considering the potential environmental consequences of GMOs, including biodiversity loss, pesticide resistance, and unintended gene transfer, what strategies does your delegation suggest to be implemented to mitigate these risks?

4. Should GMOs be labeled clearly to allow consumers to make informed food-related decisions? What are the advantages, challenges, and implications of mandatory GMO labeling? Are education centers on the matter recommended for society?

5. Does your delegation believe that genetically modified organisms can play a significant role in addressing universal food challenges, particularly in the context of climate change and a growing global population? What are the potential consequences and benefits?

6. In light of the emerging trends in genetic engineering, such as CRISPR gene editing technologies, how might these advancements alter the modern landscape of GMO debates?

7. Regarding the international economy, how does your delegation perceive the impact of GMOs in global agricultural economies, especially in developing countries? Are the economic benefits of GMOs evenly distributed worldwide, and if not, what measures does your delegation present?

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