POLICY BRIEF

Beyond the Label:
Unpacking the Lessons of GM Food Labeling Policies

By *Dr. Nina Gloriani and **Dr. Rhodora Aldemita
*Consultant, Clinical Microbiology, St. Luke's Medical Center and
**Executive Director, ISAAA Inc.

Policy Implications/Recommendations

- There is a consensus among international bodies and the National Academies of Science and Technology of most countries that GM foods are just as safe as other foods. Biosafety approvals granted for propagation, use as food/feed, or processing indicate safety for the environment, biodiversity, and human and animal health.
- No international agreements, standards, or guidelines on GM food labeling exist. Although countries with GM food labeling guidelines were for consumer information and choice, testing and enforcement were either unsuccessful or still in the early stages.
- GM food labeling for consumer information and choice is a costly endeavor. Whether voluntary or mandatory, labeling may be conducted to disclose the GM food's unique nutrition and quality content for consumer preference and nutritional needs.

Introduction

Genetically modified (GM) foods and crops have been with us for almost three decades now. Also called bioengineered foods, their safety, assessed through various scientific methods, showed no harm associated with their consumption. However, the debate on GM food safety lingers, and talks on labeling such GM products still abound. Information on GM food safety has not changed over the years. On the other hand, GM food labeling policies across countries have drastically changed in the last 10 years or so. The information contained herein may help guide stakeholders in crafting their own regulations on GM food labeling or consider conducting studies to shed more light on the issues.

GM Food Safety and GM Food Labeling Over the Years (mid-1990s to present)

All regulated GM foods/feeds/crops undergo food safety assessments based on international standards such as the UN FAO/WHO CODEX Alimentarius. Thus, all GM food products are deemed safe for commercialization, consumption, and propagation.[1, 2, 3] In the late 1990s, GM food labeling discussions started soon after GM foods were introduced in the market: mandatory labeling, voluntary labeling, negative or positive GM labeling, or no labeling.

By 2000, more than 40 countries adopted GM food labeling policies. Countries in North America, such as USA and Canada, follow voluntary labeling, while Australia, the European Union (EU), and ASEAN countries like Japan and China require mandatory labeling. Food producers, handlers, and retailers were required to disclose whether the targeted food products or the ingredients contained were derived from GM technology or materials.

GM food labeling regulations showed disparities across countries, with differences in coverage of foods or food ingredients, the threshold for labeling GM ingredients varying from 0.9% to 5% (with China not using any threshold), and labels also differed in the labeling information.

A review of these labeling regulations eventually showed that all such approaches were not successful in providing consumer choice or consumer information, were costly (US$10-20 per capita per year), and countries failed to implement their own regulations in terms of standards, GM testing, certification, and enforcement.[4,5,6] A study in the Philippines reported that mandatory labeling would result in a ~12% production cost increase, which translates to a 10% consumer price increase.[7]

Current Status of GMO Labeling: 2022 and Beyond

Developed and Industrialized Countries or Continents

After years of unsuccessfully drafting mandatory labeling bills from 2012 to 2014, the USA passed Public Law 114-216, named the "National Bioengineered Food Disclosure Standard," on July 29, 2016.[8, 9] This law used the term bioengineered food, replacing the term GMO, and established standards for labeling GM foods. Compliance with this law mandating GM food labeling started on January 1, 2022.

The law was clear in ruling that "bioengineered food shall not be treated as safer than, or not as safe as a non-bioengineered counterpart." The label does not indicate safety or nutrition but simply informs the consumer of the food's ingredients. Labeling methods include text on packaging, a symbol that represents bioengineering, and an electronic or digital link for scanning for additional information. At least 13 crops or foods in the USA now require BE labeling:

In the USA, 70-80% of foods containing GMOs have been consumed since the 1990s, but compliance with mandatory labeling only commenced in January 2022. The public debate on GMOs continues, where concerns include the effects of GMOs on human and animal health and the environment. Surveys showed a positive correlation between higher levels of education and positive perception of bioengineered foods and processes, and scientific sources being trusted more than other sources.[10, 11]

The EU's strict legislation on GMOs continues to regulate GMO technology from production, laboratory use, and introduction into the environment, including post-marketing surveillance and monitoring. The EU utilizes the precautionary principle in its GM food regulation. The threshold for mandatory labeling is >0.9% GMO per ingredient, but there are exemptions like food products from animals fed with GMOs such as meat, milk, and eggs.[12] Consumer perceptions of GMOs in the EU vary significantly by country, highly negative in France, Luxembourg, Greece, and Austria, and more positive in the Netherlands, Belgium, Finland, and Sweden. By 2020, 19 out of 27 members of the EU partially or completely banned GMOs,[13] although a Eurobarometer survey showed that the level of concern about GM foods in Europe has declined from 67% in 2010 to 27% in 2019.[14]

Low to middle-income developing countries

China has considered biotechnology as a means to increase agricultural productivity and food security.[15] It built a complex structure for GMO development and commercialization, developed GMOs for greater pest and drought resistance, and approved the importation of selected varieties of GM corn and soybean after passing biosafety evaluations.[16] In 2002, China required labeling and safety certifications for all GM imports, where regulations were overseen by a number of government agencies in agriculture, food and drug administration, environmental protection, and science and technology, among many others. Even after a massive information campaign by government agencies, consumer confidence in food safety went drastically down because of the Sanlu melamine powder incidence, with people believing GMOs to be a form of bioterrorism.[17] The GMO controversy rages on amidst people's confusion.

The Republic of South Africa, saddled with so much poverty, food insecurity, high inequity, and with a public health system under severe strain, sees bioengineering as a powerful tool to increase


Alfalfa


Apples


Canola


Corn


Cotton


Eggplant


Papaya


GM Pink Pineapple


Potatoes


GM Salmon


Soybeans


Squash


Sugarbeets

productivity, ramp up exports, and assure food security. GM crops planted in the country include maize, cotton, and soybean since 1997. There is no mandatory GMO labeling in South Africa. GM labeling applies only when allergens and human or animal proteins are present and when GM food differs significantly from a non-GM equivalent.[18] A review paper on five points to consider in the discussion of mandatory GMO labeling in Africa focuses on the assessment of ethics, consumer autonomy, costs, stigmatization, feasibility, and food security in agricultural biotechnology.[19]

In the ASEAN region, there have been efforts from policymakers in the Philippine House of Representatives[20, 21, 22] and Senate[23, 24] to file bills on mandatory labeling of GM food, but none have been passed into law to be implemented. Thus, GM food labeling remains to be voluntary in the country. In case a mandatory labeling law is implemented, production costs are expected to increase by 12%, which might translate to a 10% rise in consumer prices.[7]

Thailand updated its implementation of GM food regulations in 2022. The Ministry of Public Health (MOPH) notification No. 432 on labeling of GM foods went into force in December 2022, with the Thai FDA co-implementing these regulations. Packaged food products containing GMO ingredients equal to or >5% of the total weight must have a label as GMO. Thai FDA requires importers to display the food serial number and text specifying the GM product (e.g., corn or soybean). [25]

Discussion/Final Considerations

The foregoing review of the GM policy decisions across countries indicates that there are country-specific, scientific, or non-scientific issues, such as cultural, trade, political, or even religious perspectives, which form the basis for such policy decisions. Countries look at both the positive and negative implications of GM food labeling but tend to dwell more on the negative aspects. In GM safety and labeling controversies, concerns are not so much about the science of GM foods but fear of the unknown. There are also issues about food scandals, mistrust in government authorities, industries, and monopoly by large companies versus the growth of small farmers. In any case, GM food safety and labeling should be dealt with separately. International organizations provide guidance on food safety assessment, making it possible to commercialize food derived from GM technology for over three decades without any recorded lethal effects and, thus, are deemed safe. There is no internationally recognized standard on GM food labeling because of the many factors enumerated above, most of which are not associated with GM product development. It is important to address gaps in knowledge about the benefits versus risks of the technology so that GM food labeling will be appropriately addressed. Science and technology innovation must progress to benefit the whole society, most importantly, the marginalized. A clear balancing act may be difficult to do and would require discussion among all stakeholders: the general public or consumers, farmers, retailers, and manufacturers.

Conclusions and Recommendations

Bioengineered foods, formerly referred to as GMOs, offer the promise of higher productivity and a more sustainable agri-food system. They have been around for the last 30 years, and those commercially available have passed international food safety and environmental assessments. Despite these positive outcomes, they remain controversial, particularly the regulation of GM food labeling. For GM food labeling, we need to find the best way to address gaps and issues considering country, cultural, trade, political, and even religious perspectives. Those countries that have shown higher acceptance rates of GMOs and have experienced best practices in dealing with biotech stakeholders could serve as models for others to put in place functional and acceptable regulations, whether for bioengineered products in general or GM food labeling in particular. It is in the interest of the lower- income populace that GMO food labeling be dealt with separately from food safety assessment. International standards guide food safety assessment, but no GMO food labeling standard exists. Understanding the need for GM food labeling, considering its cost, complexity of implementation, and certification, for consumer information needs should be clarified.

A sustained effort to inform, educate, and increase the level of understanding about bioengineering will pave the way for its acceptance and harnessing its full potential in addressing food productivity, food security, and sustainable agriculture without needing GM food labeling.

By *Dr. Nina Gloriani and **Dr. Rhodora Aldemita
*Consultant, Clinical Microbiology, St. Luke's Medical Center and **Executive Director, ISAAA Inc.

References

1. Genetically modified (GM) Plants: Questions and Answers, The Royal Society, London, 2016.
2. National Academies of Sciences, Engineering and Medicine, 2016. Genetically Engineered Crops: Experiences and Prospects. Washington, DC: The National Academies Press, https://doi.org/10.17226/23395.
3. Pellegrino, E., Bedini, S., Nuti, M. et al. Impact of genetically engineered maize on agronomic, environmental and toxicological traits: a meta-analysis of 21 years of field data, Sci rep 8,3113 (201*0. https://doi.org/10.1038/s41598-018-21284-2.
4. Gruere, GP. Labeling Policies of Genetically Modified Food- Lessons from an International Review of Existing Approaches. International Food Policy Research Institute IFPRI- PBS Brief number 7.
5. Grurère, G. P. and S.R. Rao. A Review of International Labeling Policies of Genetically Modified Food to Evaluate India's Proposed Rule . AgBioForum, 10(1), 51-64. http://www.agbioforum.org/v10n1/v10n1a06-gruere.htm
6. Pocket K No. 7 Labeling GM Foods. Global Knowledge Center on Crop Biotechnology (http://www.isaaa.org/kc).
7. Augusto de Leon, Abraham Manalo, Fe Cielo Guilatco (De Leon Consulting) With Supplemental Technical Reports by Nina Gloriani-Barzaga (University of the Philippines Manila).The Cost Implications of GM Food Labeling in the Philippines. Crop Biotech Brief. Vol IV No.2, 2004.
8. Labels for GMO Foods are a Bad Idea. The Editors. Scientific American Vol. 309, No. 3, SEPTEMBER 2013. https://www.jstor.org/stable/e26017935
9. PUBLIC LAW 114–216—JULY 29, 2016, NATIONAL BIOENGINEERED FOOD DISCLOSURE STANDARD. 130 STAT 834-839.
10. Isabelle Tsakok & Fatima Ezzahra Mengoub. Genetically Modified Organisms: Promising or Problematic for Food Security? A Review of Major Developments in Selected Industrialized Countries Part I. Policy Center for the New South. Policy Brief January 20, 2021. PB 21/02.
11. Cary Funk and Brian Kennedy. The New Food Fights: U.S. Public Divides Over Food Science PEW Research Center. December 1, 2016.
12. State of play in the EU on GM-free food labelling schemes and assessment of the need for possible harmonization. Final report DG SANCO, European Commission, A report submitted by ICF GHK in association with ADAS, UK Ltd Date: 8 October 2013 Job Number 30258974
13. Manreet Sohi , Maurice Pitesky , and Joseph Gendreau . Analyzing public sentiment toward GMOs via social media between 2019-2021. GM CROPS & FOOD 2023, VOL. 14, NO. 1, 1–9 https://doi.org/10.1080/21645698.2023.2190294.
14. Special Eurobarometer Wave EB91.3 Survey: European Food Safety Authority (EFSA) and the European Commission, Directorate-General for Communication. Kantar Food safety in the EU Report, June 2019.
15. Isabelle Tsakok & Fatima Ezzahra Mengoub. Genetically Modified Organisms: Promising or Problematic for Food Security? A Review of Major Developments in Selected Industrialized Countries Part I. Policy Center for the New South. Policy Brief January 20, 2021. PB 21/02.
16. Cary Funk and Brian Kennedy. The New Food Fights: U.S. Public Divides Over Food Science PEW Research Center. December 1, 2016.
17. Isabelle Tsakok & Fatima Ezzahra Mengoub. Genetically Modified Organisms: Promising or Problematic for Food Security? A Review of Major Developments in Selected Developing Countries Part II. Policy Center for the New South. Policy Brief February 2021. PB 21/06.
18. GAIN Global Agricultural Information Network. Date : December 8, 2020. Report No. CH 2020-0161. Report Name: Agricultural Biotechnology Annual.
19. Eugene Chow May 21, 2019. China's GMO Paradox. Published in The Diplomat
20. Castillo, L. V., 2012. Lawmakers push for mandatory GMO labeling. https://www.congress.gov.ph/press/details.php?pressid=5808
21. Castillo, L. V., 2012. Solon seeks mandatory GMO labeling. https://www.congress.gov.ph/press/details.php?pressid=5875&key=GMO%
22. Press and Public Affairs Bureau, 2019. House & SEARCA jointly hold forum on Biosafety Regulatory System for GMOs. https://www.congress.gov.ph/press/details.php?pressid=11337&key=GMO%20labeling
23. Senate S. No. 52. REQUIRING THE MANDATORY LABELING OF FOOD AND FOOD PRODUCTS CONTAINING GENETICALLY-MODIFIED ORGANISMS, INCLUDING THOSE PRODUCED BY GENETIC ENGINEERING TECHNOLOGIES, AMENDING FOR THE PURPOSE REPUBLIC ACT THREE THOUSAND SEVEN, OTHERWISE KNOWN AS THE FOOD, DRUGS, AND COSMETICS AND REPUBLIC ACT SEVEN THOUSAND AND THREE HUNDRED NINETY FOUR, OTHERWISE KNOWN AS THE CONSUMER'S ACT OF THE PHILIPPINES AND FOR OTHER PURPOSES. https://hrep-website.s3.ap-southeast-1.amazonaws.com/legisdocs/basic_18/HB06411.pdf
24. House Bill No. 6411. THE PHILIPPINE GENETICALLY MODIFIED ORGANISM (GMO) LABELING ACT, THE RIGHT-TO-KNOW-ACT. https://hrep-website.s3.ap-southeast-1.amazonaws.com/legisdocs/basic_18/HB06411.pdf
25. N. Muzhinji, V. Ntuli. Genetically modified organisms and food security in Southern Africa: conundrum and discourse. Published in GM crops & food 20 July 2020. Environmental Science, Agricultural and Food Sciences DOI:10.1080/21645698.2020.1794489.
26. Oh and Ezezika: To label or not to label: balancing the risks, benefits and costs of mandatory labelling of GM food in Africa. Agriculture & Food Security 2014 3:8. doi:10.1186/2048-7010-3-8.
27. GAIN Global Agricultural Information Network. Date: February 02, 2023. Report Number: TH2023-0006 Report Name: Thailand Updates Its Implementation on GM Foods Regulations Country: Thailand Post: Bangkok Report Category: Biotechnology and Other New Production Technologies

Philippine Agriculture and Fisheries Biotechnology Program
2nd Floor DA BSWM Building, Elliptical Road cor. Visayas Ave.
Diliman, Quezon City
Philippines
https://biotech.da.gov.ph

International Service for the Acquisition of Agri-biotech Applications (ISAAA) Inc.
3rd Floor, Khush Hall, International Rice Research Institute
Los Baños, Laguna
4030 Philippines
https://www.isaaa.org

POLICY BRIEF

(February 2024)

Beyond the Label: Unpacking the Lessons of GM Food Labeling Policies

By *Dr. Nina Gloriani and **Dr. Rhodora Aldemita
*Consultant, Clinical Microbiology, St. Luke's Medical Center and **Executive Director, ISAAA Inc.