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WHITE BLACK LEGAL is an open access, peer-reviewed and refereed journal provided dedicated to express views on topical legal issues, thereby generating a cross current of ideas on emerging matters. This platform shall also ignite the initiative and desire of young law students to contribute in the field of law. The erudite response of legal luminaries shall be solicited to enable readers to explore challenges that lie before law makers, lawyers and the society at large, in the event of the ever changing social, economic and technological scenario.

With this thought, we hereby present to you

A STUDY ON THE IMPACT OF GMO LABELING POLICIES ON CONSUMER CHOICES AND ATTITUDES TOWARDS GENETICALLY MODIFIED FOODS

AUTHORED BY - SARAH VINCENT AJ¹

ABSTRACT

An organism that has had its genetic makeup altered in a lab using genetic engineering or transgenic technology is referred to as a GMO, or genetically modified organism. This results in gene combinations of bacteria, viruses, plants, and animals that do not appear in nature or as a result of conventional cross breeding techniques. As GMOs expanded in the food supply, worries about their possible implications on the environment, human health, and ethical issues developed. GMO labeling is essential because it responds to consumer demand for transparency and empowers people to make wise decisions based on their own values, beliefs, and ethical principles. This study delves into the intricate interplay between regulatory measures, consumer preferences, and societal attitudes, seeking to illuminate how GMO labeling policies influence the decisions and attitudes of consumers. Various factors intricately influence consumer attitudes and choices regarding genetically modified foods in the context of labeling policies. Cultural beliefs, personal health considerations, and ethical values play a significant role. Clarity and accessibility of labels are crucial, as is the economic aspect of affordability and availability of non-GMO options. In light of the study's findings, it is recommended that policymakers prioritize clear and accessible GMO labeling regulations, accompanied by robust educational initiatives. Ongoing research to monitor evolving attitudes towards GMOs is imperative for informed decision-making and policy adjustments. These steps collectively foster transparency, empower consumers, and harmonize technological progress with public trust in the food industry.

KEYWORDS: Genetically modified organisms, labeling, consumer choice, preferences, societal attitude

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INTRODUCTION

The evolution and history of genetically modified organisms (GMOs) trace back to the mid-20th century when scientists began manipulating the genetic material of organisms for various purposes. The development of advanced biotechnological tools led to the creation of genetically modified crops with traits like pest resistance and improved nutritional content. As GMOs became more prevalent in the food supply, concerns about their potential effects on health, environment, and ethical considerations arose. This marked the birth of the GMO labeling movement, driven by the belief that consumers have the right to know what they are consuming. GMO labeling is pivotal as it addresses consumer demand for transparency, enabling individuals to make informed choices based on personal beliefs, health considerations, and ethical values. The subsequent call for GMO labeling can be seen as a response to consumers' desire for greater autonomy over their food choices and the need to make informed decisions about what they consume. It fosters a dialogue between producers and consumers while respecting individual autonomy, thus playing a crucial role in shaping the relationship between technology, food, and society.

In India, the regulatory landscape surrounding genetically modified organisms (GMOs) is governed by the Food Safety and Standards Authority of India (FSSAI), established to ensure food safety and consumer protection. FSSAI has formulated guidelines to regulate the import, manufacture, and sale of genetically modified foods. Initiatives such as mandatory safety assessments, labeling regulations, and public awareness campaigns underscore the Indian government's commitment to balancing technological advancements with consumer interests. The Ministry of Environment, Forest and Climate Change (MoEF&CC)'s Genetic Engineering Appraisal Committee (GEAC) is in charge of evaluating requests for the release of genetically engineered organisms and products into the environment, including experimental field trials. By embracing GMO labeling, the Indian government acknowledges the importance of informed consumer choice and fosters a climate of transparency and trust between producers and consumers.

Several factors influence and revolve around the realm of genetically modified organisms (GMOs) and their labeling. Scientific consensus on GMO safety, potential health and environmental risks, and ethical considerations significantly impact public perception. Cultural and religious beliefs influence consumer attitudes, affecting preferences for GMOs and the necessity of labeling. Economic interests of both biotech companies and the agriculture sector play a role, as labeling may impact market

demand and trade agreements. Moreover, the effectiveness of labeling policies depends on their clarity, comprehensibility, and accessibility to the public. GMO labeling discussions are shaped by the changing biotechnology landscape, consumer activism, and governmental laws, which together promote a more comprehensive knowledge of this complicated problem.

The global discourse on genetically modified organisms (GMOs) has evolved, reflecting changing consumer preferences, advancements in biotechnology, and growing concerns for health and sustainability. This has led to increased awareness of the need for GMO labeling. In a country like India, where cultural, religious, and ethical considerations intersect with modern scientific advancements, GMO labeling has emerged as a pivotal factor influencing consumer choices. As consumers become more conscious of the foods they consume, the presence of clear GMO labels empowers them to align their choices with their values, whether it's health, environmental impact, or cultural beliefs.

In India, the government's regulatory body, the Food Safety and Standards Authority of India (FSSAI), oversees GMO regulations with a focus on safety assessments and consumer awareness. India's labeling initiatives align with international practices, emphasizing the transparency necessary for informed consumer choices. Comparatively, some countries like the United States have more lenient GMO regulations, with labeling often being voluntary. In contrast, several European nations have adopted stringent labeling requirements to empower consumers to make GMO-conscious choices.

OBJECTIVES

- To Examine Consumer Awareness of GMOs
- To Analyze the Influence of GMO Labeling on Consumer Choices
- To Assess Consumer Attitudes and Perceptions Towards GMOs

REVIEW OF LITERATURE

The majority of scientists assert that foods containing genetically modified organisms (GMOs) are safe for human consumption and have positive social effects like improved nutrition. Many customers are still dubious about their safety, though. In light of these opposing viewpoints, the writers examine

how various GMO labeling regulations affect the goods that consumers select. The authors demonstrate how policymakers' choice of labeling guidelines affects consumer demand for genetically modified goods. The market share of genetically modified goods is decreased by both presence-focused (contains GMO) and absence-focused (non-GMO) labeling regimes, with the latter causing a larger decrease. GMO labels increase consumers' willingness to pay for non-GM products and decrease their emphasis on price. **(Kim, Youngju, SunAh Kim, and Neeraj Arora. (2022))**² Genetically modified (GM) product labeling has a varied effect on customer behavior when it comes to purchasing, with labels frequently having two opposing effects. Due to price sensitivity or a lack of concern regarding genetic modification, some consumers may not be affected by GM labels, while others may choose non-GM products because they value transparency and make educated decisions. This paradox illustrates the complexity of consumer behavior in the context of genetically modified foods by implying that labeling GM products can both encourage and discourage consumer purchases, depending on personal values, knowledge, and financial considerations. **(Baynham, A. (2018))**³ GM substances can be found in over 60% of the products sold in supermarkets in North America. Consumer groups contend that customers have a "right to know" if the food they eat contains genetically modified ingredients, even if North American consumers appear less concerned about GM foods than do consumers in Europe and Japan. Will the labeling of genetically modified goods cause significant changes in consumer behavior? In an experimental study, the effects of genetically modified products were shown to be negligible overall, but there were notable differences in consumers' responses to GM-labeled items based on their perceived benefits of genetic engineering, amount of consumer activism, and interest in innovative foods that might benefit them as consumers. **(Heslop, L. A. (2006))**⁴ Sample labels with differing wording on genetically modified content, possible side effects, and the certifying body were given to the participants. It was discovered that labels that explicitly declared there was no GM material were regarded as the most adequate, while those that only mentioned the existence of GM elements were thought to be the most reliable. The US Food and Drug Administration (FDA)-certified labels were typically seen as more reliable and sufficient. Furthermore, consumers believed that products bearing FDA certification carried fewer long-term health hazards. The results point to a number of policy implications, such as the importance

² Kim, Youngju, SunAh Kim, and Neeraj Arora. (2022) "GMO labeling policy and consumer choice." *Journal of Marketing* 86.3 : 21-39. doi.10.1177/00222429211064901

³ Baynham, A. (2018). *The Effect of Labelling Genetically Modified Products on Consumer Purchasing Behaviour* (Doctoral dissertation, University of Guelph).

⁴ Heslop, L. A. (2006). If we label it, will they care? The effect of GM-ingredient labelling on consumer responses. *Journal of Consumer Policy*, 29(2), 203-228. doi.10.1007/s10603-006-9000-7

of certification and label text in shaping consumer attitudes and actions in the GM product market. **(Roe, B., & Teisl, M. F. (2007))**⁵ In order to investigate how various consumer types react to the effects of genetic modification (GM) in food, this study develops a model. The results show that customers' wellbeing and purchasing decisions are influenced if they believe that genetically modified products are different from conventional ones. When supply chain inefficiencies prevent consumers from receiving the financial advantages of genetically modified organisms, consumer welfare may suffer. According to the study, there are a number of factors that determine whether a policy of "no labeling" or "mandatory labeling" is better for the welfare of consumers. These factors include the degree to which consumers detest genetically modified products, the expenses associated with marketing and segregation under mandatory labeling, the percentage of GM products in total production, and the frequency with which GM products are mistakenly labeled as non-GM. **(Giannakas, K., & Fulton, M. (2002))**⁶ The two most crucial topics of this essay are genetically modified foods and labeling. This study examines the awareness, perception of risk, and level of trust that Indian consumers have in genetically modified food labels. It was discovered that the majority of people did not know that genetically modified food was labeled. However, it was noted that as consumer awareness has grown, consumers are growing more circumspect about the food they buy and eat for themselves and their family. Three categories of consumers were identified: benefit seekers, conscious consumers, and risk-averse consumers. **(Bhatia, V., Malik, S., Mishra, D., & Paul, D. (2020))**⁷

METHODOLOGY

The study has been conducted using the empirical research method. The samples have been collected using the convenient sampling method. A total of 239 samples have been collected for the study. The independent variables are age, gender, grade/year in school, locality, occupation. The dependent variables are Aware of GMO, knowledge level regarding GMOs, Consumed any food products that contain GMOs, genetically modified foods in terms of safety and health, Benefits of GMOs, potential

⁵ Roe, B., & Teisl, M. F. (2007). Genetically modified food labeling: The impacts of message and messenger on consumer perceptions of labels and products. *Food Policy*, 32(1), 49-66. doi.10.1016

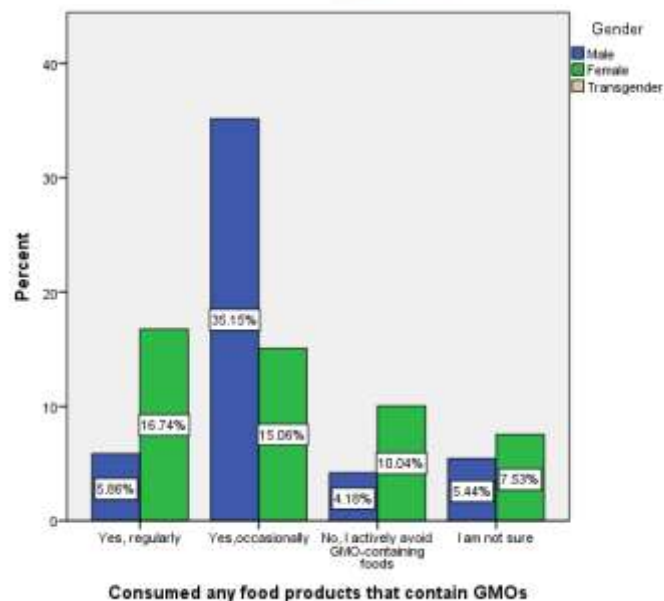
⁶ Giannakas, K., & Fulton, M. (2002). Consumption effects of genetic modification: what if consumers are right?*. *Agricultural Economics*, 27(2), 97-109. doi.10.1111/j.1574-0862.2002.tb00109.x

⁷ Bhatia, V., Malik, S., Mishra, D., & Paul, D. (2020). The labelling of genetically modified foods in India: Consumer's risk perception, trust, and knowledge. *International Journal of Engineering Research and Technology*, 13(11), 3359-3366. ISSN 0974-3154.

health risks associated with GMOs, Importance of GMO labeling, GMO labeling influence your food purchasing decisions, GMOs be regulated more strictly, Steps that could be taken for better regulation of GMOs, scientific studies be conducted to evaluate the long-term effects. Graphical representation is the statistical tool used for the study.

GRAPHICAL ANALYSIS

Figure 1



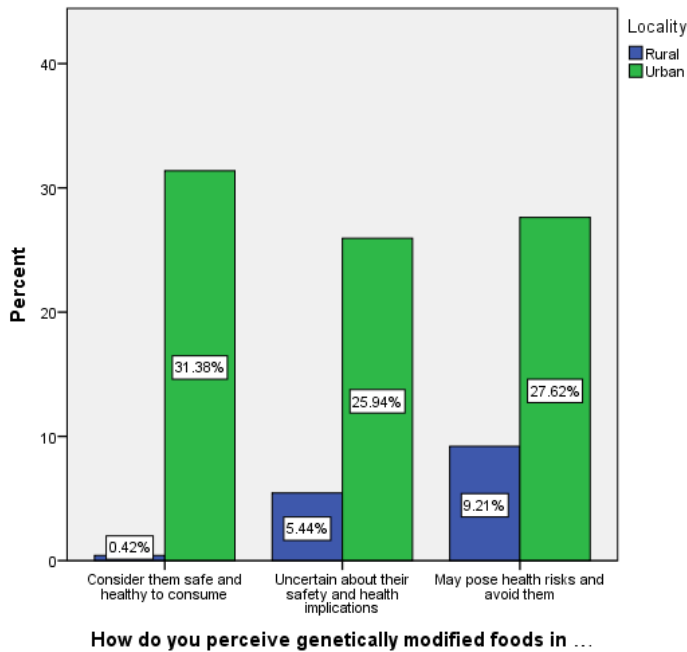
LEGEND: Depicts the gender of the respondents and whether or not they consume food products that contain GMOs.

RESULTS AND DISCUSSION:

From Fig.1 by gender, 35.15% of the male respondents and 15% of the female respondents consumed foods that contained GMOs occasionally, with 7.53% female and 5.44% male respondents not sure. The majority of respondents, as seen in Figure 1, eat foods containing GMOs on occasion, indicating a moderate level of acceptance or apathy. This pattern could be the consequence of things like availability, disparities in cost, or low knowledge of GMOs. The most common response, sporadic consumption, reveals a nuanced consumer attitude toward GMO foods that strikes a balance between

convenience and worry. This knowledge could direct the creation of regulations or business procedures, such as providing options that are clearly labeled as non-GMO or starting campaigns to raise awareness of GMOs.

Figure 2



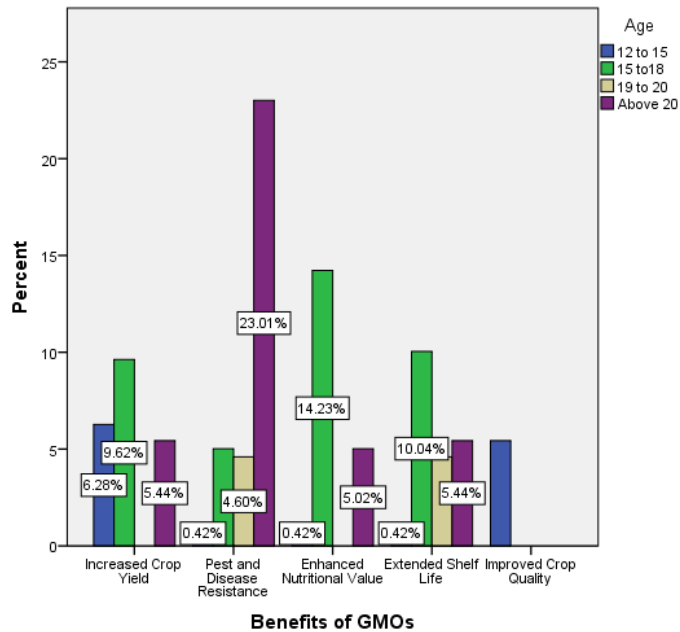
LEGEND: Depicts the locality of the respondents and their opinion on how they perceive genetically modified foods in terms of safety and health.

RESULTS AND DISCUSSION:

From Fig.2 we can see that 31.38% of the respondents from urban locality considered GMO safe and healthy to consume while 9.21% felt it may pose health risks and try to avoid them. Some argue that GMOs are rigorously tested and deemed safe for consumption by regulatory bodies worldwide. They point to the substantial scientific consensus affirming their safety. On the other hand, a contingent expresses uncertainty about GMO safety, citing the long-term effects as a significant concern. They emphasize the need for more comprehensive, independent research to ascertain any potential health risks. For this group, caution is paramount, and they opt to err on the side of prudence by avoiding

GMO foods until further conclusive evidence is presented.

Figure 3

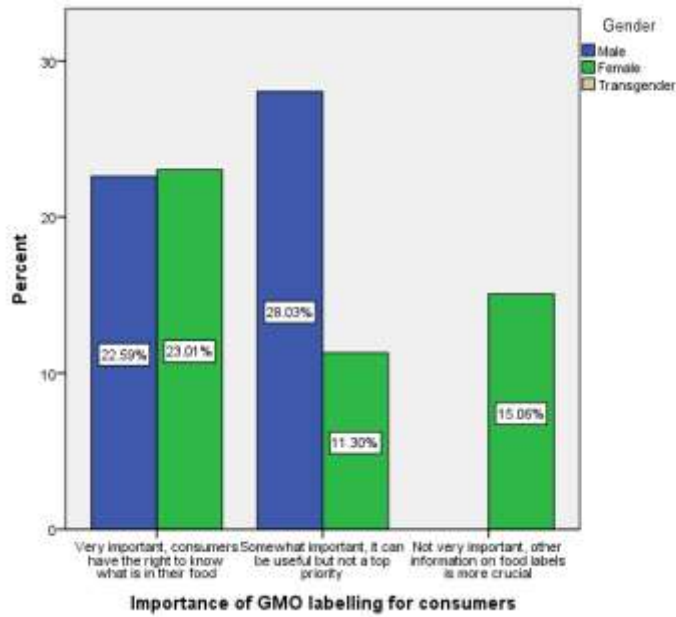


LEGEND: Depicts the age of the respondents and their opinion on the benefits of GMOs.

RESULTS AND DISCUSSION:

From Fig.3 we can see that 23.01% of the above 20 years age group chose pest and disease resistant as the benefits of GMOs followed by 14.23% choosing enhanced nutritional value. GMOs hold the key to enhancing food security by enabling crops to thrive in diverse environmental conditions. This technology has the potential to increase agricultural yields, thus meeting the escalating demand for food in a rapidly growing world population. Additionally, GMOs can play a pivotal role in reducing the need for chemical pesticides and fertilizers, mitigating environmental impact.

Figure 4

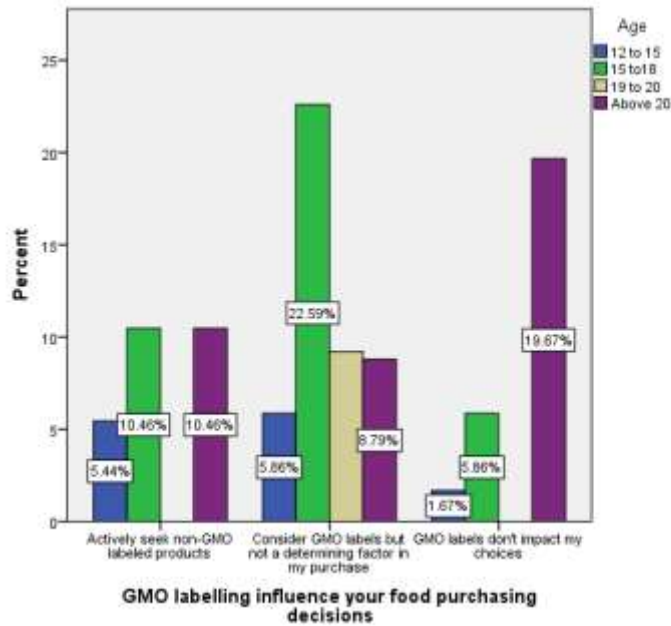


LEGEND: Depicts the gender of the respondents and their opinion on the importance of GMO labeling for consumers.

RESULTS AND DISCUSSION:

From Fig.4 we can see that 28.03% of the male respondents chose GMO labeling to be somewhat important - it can be useful but not a top priority and 23.01% of the female respondents chose very important - consumers have the right to know what is in their food. GMO labeling is crucial for enabling customers to make knowledgeable decisions about the food they eat. In order for people to know whether a product contains genetically modified organisms, it acts as a crucial tool for transparency. It encourages transparency in the food market and encourages communication between buyers and sellers. In the end, GMO labeling fosters confidence, empowering customers to independently and confidently navigate the complex world of modern agriculture.

Figure 5



LEGEND: Depicts the age of the respondents and their opinion on how GMO labeling influences their food purchasing decisions.

RESULTS AND DISCUSSION:

From Fig.5 we can see that 19.67% of those belonging to the above 20 age group chose that GMO labeling does not impact their food purchasing decisions, followed by 22.59% who chose to consider GMO labels but not as a determining factor in their purchase. Those who think labeling has a big impact contend that it gives consumers the knowledge they need to match their purchases with their beliefs and health preferences. They argue that unambiguous GMO labels encourage better decision-making by allowing people to choose or reject genetically modified products. Contrarily, some respondents say that the impact of GMO labeling is negligible. They contend that in the decision-making process for consumers, other aspects such as price, flavor, and brand loyalty sometimes trump the presence or lack of a GMO label. While this group acknowledges the importance of labeling for transparency, they argue that it may not always be the deciding element in consumer decisions.

CONCLUSION

Genetically modified organisms (GMOs) are used in a wide range of food products, but their safety and benefits remain controversial. Many consumers are concerned about the potential risks of GMOs, and there is a growing demand for GMO labeling. The importance of labeling regulations in influencing customer perceptions and purchasing decisions about genetically modified foods is central to this topic. The design of GMO labeling can influence consumer reactions, the study shows. For instance, negative or cautionary language on labels may be more likely to discourage customers from buying GM foods. Based on the findings of this study, several recommendations and suggestions emerge. Firstly, policymakers should prioritize clear and accessible GMO labeling regulations, ensuring that information is presented in a format easily comprehensible to a diverse consumer base. Additionally, public awareness campaigns and educational initiatives should be implemented to bridge knowledge gaps and empower consumers to make informed choices. Collaboration between regulatory bodies, the food industry, and consumer advocacy groups is crucial in refining labeling policies to balance technological advancements with consumer empowerment. Furthermore, ongoing research and monitoring of consumer attitudes and preferences towards GMOs are imperative to ensure that labeling policies remain responsive to evolving societal dynamics.

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