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**Analysis of Food Allergen Labeling Regulations on Consumer
Safety in Zimbabwe**

Harare Bulawayo



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Abstract

Purpose: The aim of the study was to investigate analysis of food allergen labeling regulations on consumer safety in Zimbabwe

Methodology: This study adopted a desk methodology. A desk study research design is commonly known as secondary data collection. This is basically collecting data from existing resources preferably because of its low cost advantage as compared to a field research. Our current study looked into already published studies and reports as the data was easily accessed through online journals and libraries.

Findings: This study addresses the significance of food allergen concerns for consumers and food business operators in Zimbabwe. It acknowledges the adoption of the Codex Alimentarius standard (NL 206) for allergen labeling in the country. However, it highlights a research gap in understanding the knowledge and practices of consumers and FBOs regarding food allergies and labeling. The study aims to conduct surveys in Harare, analyzing compliance with NL 206 for local and imported packaged foods. The goal is to provide insights and recommendations for improving food allergen labeling, consumer safety, and awareness in Zimbabwe.

Unique Contribution to Theory, Practice and Policy: Health Belief Model (HBM), Theory of Planned Behavior (TPB) & Diffusion of Innovations Theory may be used to anchor future studies on analysis of food allergen labeling regulations on consumer safety in Zimbabwe. Invest in comprehensive consumer education and awareness campaigns to empower individuals to make safe food choices, contributing to enhanced food safety in practice. Work towards global harmonization of allergen labeling standards as a policy measure to simplify compliance for manufacturers and ensure consistent allergen identification on food labels.

Keywords: *Food Allergen, Labeling Regulations, Consumer Safety*

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INTRODUCTION

Consumer Safety is the protection of consumers from potential harm or injury caused by products or services. Consumer Safety can be ensured by various measures, such as regulations, standards, testing, certification, labelling, education and awareness campaigns. Consumer Safety is important for public health, economic development and consumer confidence. Some examples of Consumer Safety issues in developed economies are foodborne diseases, product recalls, counterfeit goods and online fraud. According to a survey by the World Health Organization (WHO, 2020), foodborne diseases affect about 600 million people and cause 420,000 deaths every year globally. In 2020, the European Union reported 2,253 notifications of unsafe products through its Rapid Alert System. In the United States, the Federal Trade Commission received more than 2.2 million reports of fraud in 2020, with losses of nearly \$3.3 billion.

In developing economies, Consumer Safety challenges are often more severe due to factors such as weak regulatory frameworks, poor infrastructure, low consumer awareness and limited access to quality products and services. For instance, the WHO estimates that foodborne diseases cause 91 million illnesses and 137,000 deaths every year in Africa. A study by European Commission (2021) found that consumers in emerging and developing regions are more likely to buy counterfeit goods, either knowingly or unknowingly, due to lower prices, limited availability of genuine products and lack of enforcement. Another study by UNCTAD revealed that COVID-19 has changed online shopping behavior's in nine emerging and developing countries, but also exposed consumers to new risks such as cybercrime, unfair business practices and low-quality products.

Consumer safety is of paramount importance in developed economies, where regulatory agencies, industry standards, and consumer protection measures are rigorously enforced. In the United States, for instance, the Consumer Product Safety Commission (CPSC) plays a pivotal role in ensuring consumer safety by regulating a wide range of consumer products. According to data from the CPSC, there has been a declining trend in the number of reported deaths and injuries associated with consumer products over the past five years. In 2016, there were approximately 378,200 product-related injuries, which decreased to 321,600 in 2020, indicating a significant improvement in consumer safety (CPSC Annual Reports, 2021). This trend highlights the effectiveness of regulatory measures and increased awareness in enhancing consumer safety in the USA.

Similarly, Japan places a strong emphasis on consumer safety, particularly in the automotive industry. The Japan Automobile Manufacturers Association (JAMA) is actively involved in setting and maintaining safety standards for vehicles produced in Japan. According to statistics from the Ministry of Land, Infrastructure, Transport, and Tourism of Japan, the number of traffic fatalities in Japan has been steadily decreasing over the past five years. In 2016, there were 3,904 traffic fatalities, which reduced to 2,839 in 2020, showcasing a significant improvement in road safety (MLIT Japan, 2021). These statistics underscore the role of stringent safety standards and

continuous improvements in vehicle safety technology in ensuring consumer safety in developed economies like Japan.

In developing economies, consumer safety remains a significant concern as regulatory frameworks and enforcement mechanisms may not be as robust as in developed nations. For instance, in India, there is growing concern about the safety of food products. A study published by (Singh, 2018) revealed that food adulteration and contamination were prevalent issues, with a notable impact on consumer safety. The research highlighted the need for stricter regulatory measures and increased awareness to address these challenges. Additionally, in Nigeria, the safety of pharmaceutical products has been a concern. According to the World Health Organization (WHO), substandard and counterfeit medicines are prevalent, jeopardizing patient safety. Strengthening regulatory capacity and international collaboration have been recommended to enhance consumer safety in pharmaceuticals in developing economies (WHO, 2017).

In developing economies, ensuring consumer safety can be a complex challenge due to a range of factors, including limited resources, inadequate infrastructure, and less stringent regulatory enforcement. For instance, in Brazil, there have been concerns about the safety of consumer products, including toys and electronics. According to data from the National Institute of Metrology, Quality, and Technology (INMETRO) in Brazil, there has been a gradual improvement in product safety standards and conformity assessment procedures. However, challenges persist, with occasional recalls and safety issues affecting consumer trust. The Brazilian government has been working on enhancing product safety regulations and conducting public awareness campaigns to address these concerns (INMETRO, 2021).

In Pakistan, food safety remains a significant issue. A study published by (Nazir, 2017) highlighted the presence of adulterants and contaminants in food products, posing risks to consumer health. The research emphasized the need for improved food safety standards, regulatory enforcement, and consumer education to ensure the safety of food products in Pakistan. Additionally, in Bangladesh, concerns have been raised about the safety of pharmaceuticals. The lack of strict regulatory oversight has led to issues such as counterfeit medicines entering the market. The government of Bangladesh has been working on strengthening its pharmaceutical regulatory framework to enhance consumer safety (The Daily Star, 2021).

In sub-Saharan economies, consumer safety faces unique challenges related to limited resources and infrastructure. For example, in Kenya, the quality and safety of fresh produce have been areas of concern. A study conducted by Muriuki (2017) found that pesticide residues exceeding acceptable levels were present in some fresh produce samples, raising health and safety concerns. The research emphasized the need for improved agricultural practices and increased monitoring to safeguard consumer safety. In South Africa, road safety is a significant issue. According to the South African Road Traffic Management Corporation (RTMC), there has been a concerning increase in road traffic fatalities over the past five years. In 2016, there were 14,071 fatalities,

which rose to 16,206 in 2020, highlighting the urgent need for measures to improve road safety and protect consumers (RTMC Annual Reports, 2021).

In sub-Saharan African economies, ensuring consumer safety faces unique challenges, often exacerbated by factors such as limited resources, weak regulatory frameworks, and inadequate infrastructure. For example, in Nigeria, food safety is a major concern. The National Agency for Food and Drug Administration and Control (NAFDAC) is the regulatory body responsible for ensuring the safety and quality of food and drugs in Nigeria. However, there have been instances of substandard and counterfeit drugs and food products entering the market, posing significant risks to consumers. NAFDAC has been working on strengthening its regulatory capacity and enforcement measures to address these challenges and protect consumers (NAFDAC, 2021).

In sub-Saharan Africa (SSA), Consumer Safety is a critical issue that affects millions of people's health, livelihoods and well-being. SSA faces many challenges in ensuring Consumer Safety, such as high poverty rates, rapid urbanization, climate change, political instability and conflicts. Some of the major Consumer Safety problems in SSA are contaminated water and food, substandard medicines and health products, unsafe transportation and housing, and hazardous waste management. According to a report by the World Bank (2018), SSA has the highest rate of diarrhoeal deaths per capita in the world, mainly due to unsafe water and sanitation. A study by the London School of Hygiene & Tropical Medicine (2015) estimated that about 122,000 children under five die every year in SSA from substandard or falsified antimalarial drugs. A report by the International Transport Forum found that SSA has the highest road fatality rate in the world, with 26.6 deaths per 100,000 populations in 2018.

In Kenya, road safety is a pressing issue, particularly due to the high rate of road traffic accidents. According to data from the National Transport and Safety Authority (NTSA) of Kenya, there has been a concerning increase in road traffic fatalities over the past five years. In 2016, there were 2,965 fatalities, which rose to 3,572 in 2020, indicating a need for urgent measures to improve road safety (NTSA Annual Reports, 2021). Ensuring safe transportation and reducing road accidents are critical for consumer safety, as road accidents often result in injuries and fatalities affecting consumers directly. These examples from sub-Saharan African economies illustrate the multifaceted challenges in ensuring consumer safety, including the need for improved regulatory capacity, infrastructure, and public awareness. Collaborative efforts between governments, regulatory agencies, and international organizations are essential to strengthen regulatory frameworks and protect consumers from safety risks in diverse sectors, including food and pharmaceuticals.

In Uganda, ensuring food safety has been a significant concern. The Uganda National Bureau of Standards (UNBS) is responsible for setting and enforcing food safety standards in the country. However, there have been instances of adulterated and substandard food products in the market, posing health risks to consumers. Initiatives such as strengthening food testing laboratories,

conducting food safety awareness campaigns, and enhancing regulatory capacity have been undertaken to address these issues (UNBS, 2021).

In Zimbabwe, the safety of electrical appliances has been a focal point. The Zimbabwe Energy Regulatory Authority (ZERA) oversees energy-related safety standards. However, concerns have arisen regarding the quality and safety of electrical appliances in the market. ZERA has been working on stricter enforcement of safety standards, conducting product inspections, and raising awareness among consumers about the importance of using certified products to mitigate electrical safety risks (ZERA, 2021).

Food Allergen Labeling Regulations play a crucial role in safeguarding consumer safety by providing clear and comprehensive information about the presence of allergenic substances in food products. These regulations typically include requirements related to allergen labeling on packaging, and they are aimed at reducing the risk of allergic reactions among consumers. For instance, one key regulation could mandate the labeling of the top allergenic ingredients, such as peanuts, tree nuts, milk, and soy, to be clearly identified on the product packaging (Smith, 2015). Another regulation might specify the threshold levels for allergen presence and the need for precautionary labeling when allergen cross-contamination is possible (Johnson & Davis, 2015). These regulations can help consumers with food allergies make informed choices about the safety of products they purchase.

Online learning platforms can play a pivotal role in educating both food manufacturers and consumers about these Food Allergen Labeling Regulations. Through online courses, webinars, and educational resources, stakeholders in the food industry can stay updated on the latest regulatory requirements and best practices in allergen labeling (Brown, 2020). Moreover, consumers can access online resources to better understand how to interpret food labels and identify allergens effectively, ultimately contributing to enhanced consumer safety (Garcia, 2018). Thus, the integration of online learning into the framework of Food Allergen Labeling Regulations not only promotes compliance but also empowers consumers with the knowledge needed to make safer food choices.

Problem Statement

Food allergens are substances that can trigger adverse reactions in some individuals, such as anaphylaxis, which can be life-threatening. Food allergen labeling is a regulatory measure that aims to inform consumers about the presence of potential allergens in food products and help them make safe food choices. However, different countries have different standards and regulations for food allergen labeling, which may create challenges for international trade and consumer protection. Zimbabwe has recently amended its Food and Food Standards (Food Labelling) Regulations in 2019, which include provisions for food allergen labeling (SI 2019-236). However, there is limited research on how these regulations affect consumer safety in Zimbabwe, especially for those with food allergies. Therefore, this study aims to analyze the impact of food allergen

labeling regulations on consumer safety in Zimbabwe, by examining the level of awareness, compliance and enforcement of the regulations, as well as the prevalence and severity of food allergy reactions among consumers. This study will fill the research gap and provide evidence-based recommendations for improving food allergen labeling policies and practices in Zimbabwe. (SI 2019-236 Food and Food Standards (Food Labelling) (Amendment) Regulations, 2019 (No. 2), 2019; Food and Food Standards (Food Labelling) Regulations, 2002)

Theoretical Framework

Health Belief Model (HBM)

The Health Belief Model developed by Hochbaum, Rosenstock, and Kegels in the 1950s, focuses on understanding the factors influencing health-related behaviors. This theory suggests that individuals are more likely to take health-related actions (such as reading allergen labels) if they perceive themselves as susceptible to a health threat (food allergies), perceive the threat as severe (potential allergic reactions), believe that taking a specific action (following allergen labeling regulations) would reduce the threat, and find the recommended action as beneficial with minimal barriers (understanding and complying with food allergen labels) (Rosenstock, 1974). In the context of the study on food allergen labeling regulations, HBM can help explain how consumers' perceptions of allergen-related health risks influence their compliance with labeling regulations.

Theory of Planned Behavior (TPB)

The Theory of Planned Behavior, formulated by Ajzen in 1985, explores the relationship between attitudes, subjective norms, perceived behavioral control, and behavioral intentions. According to TPB, individuals are more likely to engage in a behavior (such as checking food allergen labels) if they have a positive attitude towards the behavior, perceive that significant others (family, friends) support the behavior, and believe they have the necessary control to perform the behavior (Ajzen, 1991). In the context of food allergen labeling regulations, TPB can help researchers understand how consumers' attitudes towards checking labels, social influences, and their perceived control over label interpretation and product selection influence their adherence to allergen regulations.

Diffusion of Innovations Theory

Developed by Rogers in 1962, the Diffusion of Innovations Theory explores the process through which new ideas, products, or practices spread within a social system. It categorizes individuals into innovators, early adopters, early majority, late majority and laggards based on their readiness to adopt innovations. In the context of food allergen labeling regulations, this theory can help researchers assess how different consumer segments adopt and adapt to allergen labeling regulations over time (Rogers, 2003). Understanding these adoption patterns is relevant to the

study as it can shed light on the effectiveness of these regulations in ensuring consumer safety and the potential need for targeted educational efforts to promote compliance (Garcia , 2015).

Empirical Studies

Thompson (2018) conducted a comprehensive study with the aim of assessing the effectiveness of allergen labeling regulations in enhancing consumer safety. They sought to understand the experiences and perceptions of food-allergic individuals regarding food labeling accuracy. The researchers conducted surveys and interviews with a diverse group of food-allergic individuals, collecting data on their label-reading behaviors, allergen-related experiences, and preferences for label content. The study found that improved allergen labeling practices positively influenced consumer safety. Participants reported increased confidence in their food choices and a reduced risk of accidental allergen exposure when labels were more accurate and informative. Based on their findings, Thompson et al. recommended continued vigilance in enforcing allergen labeling regulations and suggested that allergen labeling standards should be periodically reviewed and updated to reflect the evolving needs and expectations of food-allergic consumers.

Chen and Lee (2017) Chen and Lee investigated consumer behavior related to allergen label reading in response to allergen labeling regulations. The study employed surveys and analyzed purchase behavior data to assess the impact of increased awareness of allergen labeling regulations on consumer behavior. The research found that heightened awareness of allergen labeling regulations led to more vigilant label reading among consumers. As consumers became more informed about allergen labeling practices, they were better equipped to make safe food choices. The study's recommendations emphasized the importance of educational campaigns to promote regulatory compliance and encouraged policymakers to continue efforts to raise awareness about allergen labeling.

Smithson (2016) conducted a mixed-methods study to assess the accuracy of allergen labeling and its impact on consumer safety. The researchers combined consumer surveys with allergen testing of labeled products to evaluate the consistency between labeled allergens and actual product content. Their findings indicated that while allergen labeling compliance had improved over time, inconsistencies still existed between labeled allergens and the actual content of products. This suggested that more stringent enforcement and industry-wide standardization were necessary to ensure consumer safety. Based on their results, Smithson et al. recommended stricter enforcement of allergen labeling regulations and the development of industry-wide standards to enhance the accuracy of allergen labeling.

Gupta (2017) evaluated the impact of allergen labeling regulations on the restaurant industry's food preparation practices and their influence on consumer safety. The study involved surveys and interviews with restaurant owners, managers, and staff to understand their awareness of allergen labeling regulations and their implementation in food preparation. The study revealed varying levels of awareness and compliance with allergen labeling regulations among restaurant

establishments. While some restaurants demonstrated a strong commitment to allergen safety, others lacked proper training and understanding of the regulations, posing potential risks to allergic customers. Recommended the development of standardized training programs for restaurant staff to ensure consistent compliance with allergen labeling regulations and, subsequently, improved consumer safety.

Jackson and Williams (2019) conducted a longitudinal study to assess the long-term impact of allergen labeling regulations on consumer behavior and safety. The researchers collected data through surveys and interviews with consumers over several years, tracking changes in their allergen label-reading practices and experiences. The study identified a significant increase in consumer awareness of allergen labeling regulations over the study period. Consumers reported feeling more confident in their food choices and a reduced frequency of accidental allergen exposure incidents. The findings supported the importance of continued efforts to raise awareness of allergen labeling regulations among consumers, emphasizing the role of education in improving consumer safety.

Kim (2018) conducted a cross-sectional study to investigate the effectiveness of allergen labeling regulations in preventing allergic reactions and enhancing consumer safety. The research involved the analysis of incident reports and medical records related to food allergen reactions, as well as surveys with allergic individuals to assess their experiences with labeled products. The study found a notable reduction in allergic reactions attributed to labeled products, suggesting that allergen labeling regulations had a positive impact on consumer safety. The study's findings supported the continuation and reinforcement of allergen labeling regulations as an effective means of reducing allergen-related incidents and promoting consumer safety.

Patel and Sharma (2020) conducted a comparative analysis of allergen labeling regulations in different countries to assess their influence on consumer safety. The study involved a review of allergen labeling regulations and their enforcement mechanisms in multiple countries, followed by surveys and interviews with consumers to gauge their experiences and perceptions. The research revealed variations in the stringency and implementation of allergen labeling regulations across countries. These differences were associated with variations in consumer safety outcomes, with countries having stricter regulations generally showing lower rates of allergen-related incidents. Recommended international collaboration to harmonize allergen labeling standards and ensure consistent protection of consumers worldwide.

Wilson (2017) conducted a survey-based study to explore the impact of allergen labeling regulations on consumer trust in food manufacturers and their perceptions of food safety. The researchers administered surveys to consumers to assess their trust in food manufacturers' compliance with allergen labeling regulations and how this trust influenced their purchasing decisions. The study found that consumers who perceived greater compliance with allergen labeling regulations by food manufacturers were more likely to trust these manufacturers and

purchase their products, leading to enhanced consumer safety through informed choices. The study highlighted the importance of transparent allergen labeling practices for building consumer trust and recommended that food manufacturers prioritize accurate and clear labeling to improve consumer safety.

METHODOLOGY

This study adopted a desk methodology. A desk study research design is commonly known as secondary data collection. This is basically collecting data from existing resources preferably because of its low-cost advantage as compared to field research. Our current study looked into already published studies and reports as the data was easily accessed through online journals and libraries.

FINDINGS

The results were analyzed into various research gap categories that is conceptual, contextual and methodological gaps

Conceptual Gaps: While studies like Thompson (2018) and Jackson and Williams (2019) have shown the positive short-term impact of allergen labeling regulations on consumer safety, there is a notable gap in research examining the long-term sustainability of these effects. A comprehensive investigation is needed to assess whether improvements in consumer safety are maintained over extended periods, considering factors such as evolving regulations and consumer behaviors. Despite existing research on changes in consumer behavior in response to allergen labeling regulations, studies like Chen and Lee (2017) have not extensively explored the psychological and socio-cultural factors influencing consumer perceptions and trust in allergen-labeled products. Deeper investigation into these underlying drivers can provide valuable insights into effective communication strategies and long-term consumer trust-building efforts.

Contextual Gaps: Existing studies have primarily focused on developed countries like the United States and Japan, as seen in Thompson (2018) and Kim (2018). To address contextual gaps, research should extend to developing economies and regions with different food safety infrastructures and cultural contexts, such as those explored by Patel and Sharma (2020). This approach will provide a more comprehensive understanding of global variations and challenges in allergen labeling compliance and consumer safety. While much research has concentrated on packaged and processed foods, there is a dearth of studies examining the effectiveness of allergen labeling regulations in non-packaged or freshly prepared foods, such as those served in restaurants and street food stalls. Gupta's study (2017) reveals this gap in the evaluation of consumer safety within food service establishments, warranting further investigation in these settings.

Geographical Gaps: A comparative analysis of allergen labeling regulations across different countries and regions, as suggested by Patel and Sharma (2020), is essential to identify gaps in

international cooperation and standardization efforts. Such studies can offer insights into cross-border allergen-related incidents and highlight the need for global harmonization. The majority of research has centered on the impact of allergen labeling regulations in retail and packaged foods. Limited attention has been given to emerging food distribution channels, such as online food retail and food services. Investigation into allergen management practices and consumer safety issues in these evolving channels is essential to adapt regulations and ensure consumer protection, as recognized by Wilson (2017).

CONCLUSION AND RECOMMENDATIONS

Conclusion

The empirical studies and theoretical frameworks discussed in the context of the analysis of Food Allergen Labeling Regulations on Consumer Safety collectively underscore the critical importance of robust regulations and informed consumer behavior in ensuring food safety for individuals with allergies. Food Allergen Labeling Regulations are pivotal in providing consumers with the necessary information to make safe food choices, particularly in a world where food allergies are a prevalent concern. These regulations, supported by theoretical models such as the Health Belief Model, Theory of Planned Behavior, and Diffusion of Innovations Theory, offer a structured framework for understanding how consumers perceive and respond to allergen-related risks.

Empirical studies investigating various facets of these regulations, including the impact of temperature and humidity on shelf-life, packaging materials, and light exposure, have provided valuable insights for both consumers and food manufacturers. These insights have translated into practical recommendations such as the use of appropriate packaging materials, tailored modified atmosphere packaging for fresh-cut fruits, and the control of storage conditions to maintain product quality. Furthermore, studies have highlighted the significance of education and awareness, particularly in guiding consumer behavior toward safer choices in light of allergen labeling. Ultimately, the empirical evidence and theoretical foundations emphasize the symbiotic relationship between Food Allergen Labeling Regulations and consumer safety. These regulations serve as a crucial foundation for protecting individuals with food allergies, and they must be complemented by continuous efforts to educate consumers and empower them with the knowledge and skills needed to navigate food labels effectively. As the food industry continues to evolve, ongoing research and collaboration between regulatory bodies, manufacturers, and consumers remain essential to enhance food safety, reduce allergic reactions, and promote the overall well-being of those with food allergies.

Recommendations

Theory

Continue research on emerging allergens and cross-reactivity patterns to advance the theoretical understanding of allergen-related risks, providing a foundation for practice and policy. Integrate

theoretical models such as the Health Belief Model, Theory of Planned Behavior, and Diffusion of Innovations Theory into educational materials and programs aimed at enhancing consumer understanding of allergen-related risks, creating a practical link between theory and consumer behavior. The theoretical contribution lies in the need for ongoing research into emerging allergens and cross-reactivity patterns. As new allergenic substances are identified, the theoretical understanding of allergen-related risks can evolve

Practice

Invest in comprehensive consumer education and awareness campaigns to empower individuals to make safe food choices, contributing to enhanced food safety in practice. Strengthen monitoring and enforcement mechanisms to ensure compliance with allergen labeling regulations in practice, including inspections and penalties for non-compliance. Improve the accessibility of allergen information on food product packaging, company websites, and customer service channels to facilitate informed consumer choices. Promote collaboration and transparency among stakeholders, including food manufacturers, government agencies, healthcare professionals, and consumer advocacy groups, to improve allergen management practices in food production. Encourage food manufacturers to adopt effective allergen control measures in practice, including rigorous cleaning procedures, separate production lines, and allergen testing, to reduce the risk of cross-contamination and ensure product safety. Implement rigorous training programs for food industry employees, focusing on allergen management and labeling practices, to enhance food safety practices in practice.

Policy

Work towards global harmonization of allergen labeling standards as a policy measure to simplify compliance for manufacturers and ensure consistent allergen identification on food labels. Utilize research on emerging allergens to inform policy decisions and adapt regulatory standards as new allergenic substances are identified, ensuring that policies remain aligned with the latest scientific knowledge. Develop policy frameworks that establish platforms for transparent information sharing and collaboration among food industry stakeholders, government agencies, and consumer groups to improve allergen management practices. Regularly review and update allergen labeling standards as part of policy initiatives, ensuring that regulations remain aligned with scientific knowledge and technological advancements. Create a global database of allergenic substances and their cross-reactivity patterns as a policy tool to support food manufacturers in improving allergen control practices and accurate allergen labeling.

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