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Research Article

Perceptions of Food Safety Regulations Among Nigerian Stakeholders Towards Addressing Rising Food Fraud Vulnerability: An Empirical Study

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Abstract

Background and Objective: Owing to uncertainties regarding food safety and the need for confirmation of stakeholder's perception of national food safety control measures. This study was executed to evaluate the effectiveness of agencies and measures put in place to ensure food safety has necessitated this study. **Materials and Methods:** The study evaluated the perceptions and experiences of various stakeholders in the Nigerian food sector using electronically administered questionnaire and randomized sampling. The data obtained was summarized, analysed and interpreted to draw inferences based on survey responses. It also evaluates the performance of regulatory agencies in the Nigerian food sector. **Results:** From the study 53% of Nigerian stakeholders in the food sector had high awareness levels of food safety regulations and challenges. The NAFDAC was rated by the respondents as the most effective agency, while others like NAQS and FMAFS need significant improvements among Nigerian food related agencies. As 53% of the respondents expressed confidence in safety of manufactured food. **Conclusion:** This study suggested the development and implementation of suitable public policies, stronger enforcement and streamlined processes that would strengthen the existing regulatory framework for food safety in Nigeria. This is necessary to guarantee the safety of everyone involved in the process and to safeguard the health of consumers.

Key words: Consumers, performance, food safety, stakeholder perceptions, food fraud prevention

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Competing Interest: The author has declared that no competing interest exists.

Data Availability: All relevant data are within the paper and its supporting information files.

INTRODUCTION

Global human population has steadily increased especially in the global south, resulting in higher food demand¹. This surge impacts food security and food safety, especially in countries like Nigeria, where the food industry is growing and regulated by various agencies². These regulations are designed to ensure the safety and quality of food products, protect consumers and promote fair trade practices. Several actors in the food chain are stretched to keep meeting this demand despite the ever-challenging economic situation of Nigeria. While some have been reported to result in sharp practices such as food fraud (intentional adulteration, using misleading statements, counterfeiting and tampering for economic gains). Food fraud causes harm in many folds which are far-reaching including economic detriments to customers, legitimate food providers and the overall food sector; potential public health detriments both directly and indirectly and systemic detriments that erode trust in the government's capacity to regulate food³.

Nigeria is revered as the economic powerhouse of Africa and the country with the most abundant natural resources in recent decades on the continent⁴. Regrettably, the majority of households with low socioeconomic status mostly consume basic food items that are manufactured by the informal sector. This exposes them to repetitive diets, which exacerbate concerns around food safety culture. Moreover, the persistent issue of food safety problems in Nigeria has been exacerbated by opportunistic and profit-driven actions, such as food fraud, adulteration and food knowledge imbalances⁵. A significant percentage of Nigerians are reported to be living in poverty, with rising unemployment which may be a contributing factor⁴. There have been incidents of Nigerian regulatory agencies apprehending traffic food hawkers selling food with misleading statements (tampered expiration dates), counterfeit food products and incidents of discovered fake product manufacturing companies by the agencies as well as recorded cases of regulatory agencies discovering local food cafeteria and multinational confectionary outlets using adulterated raw materials and expired raw materials. Street food vending activities in the majority of developing nations operate without official control or protection. The economic significance of these activities is often underestimated due to the informal character of the enterprise and the absence of public data on the scale of commerce involved⁶. Fortunately, Nigeria was among the few countries that adopted the Codex Alimentarius Code of Practice for Street Vended Food in 2010 NCP 32. Agencies such as the Standards Organisation of Nigeria (SON), the National Agency for Food and Drug

Administration and Control (NAFDAC), the Ministry of Agriculture and Food Security (FMAFS), Federal Competition and Consumer Protection Commission (FCCPC) and the Federal Ministry of Health (FMH) play vital roles in ensuring food safety and security in the nation. From the implementation of established national policies aimed at addressing food hygiene and safety practices² to the development of food and agriculture-related standards, codes of practices and guidelines as well as inspection and certification, the regulatory agencies are pivotal to protecting the Nigerian population and preventing food-borne diseases in Nigeria. The Nigeria's food safety regulatory framework currently operates as a sectoral system that encapsulates various agencies at three levels of government which are federal, state and local government bodies⁵. Despite the high level of food safety certification and consciousness of genuine food manufacturers in Nigeria, consumer and citizen participation and knowledge related to food safety are important in supporting the activities of regulatory agencies, especially through reporting and advocacy. This study was conducted to gain insights into the awareness and perceived effectiveness, challenges and areas of improvement in the food safety regulatory framework of food regulators in Nigeria especially in current times due to heightened economic challenges. It targeted various stakeholders in the Nigerian food industry, exploring topics such as awareness of food safety regulations and standards, the effectiveness of the current regulatory framework and the challenges faced by food manufacturers in compliance. This study suggests the development and implementation of suitable public policies that would strengthen the existing regulatory framework for food safety in Nigeria. This is necessary to guarantee the safety of everyone involved in the process and to safeguard the health of consumers.

MATERIALS AND METHODS

Study area: The research was carried out in Nigeria and Japan over 3 months from 2nd June, 2024 to 8th August, 2024. To provide a thorough evaluation of the regulatory framework, the study concentrated on the Nigerian Food Industry, covering different regions (with sample collections in Lagos State, Oyo State, Kaduna State, Kwara State and Federal Capital Territory Abuja).

Study design and data collection: A mixed-methods approach was employed, combining quantitative and qualitative data collection techniques using a survey

questionnaire published via Microsoft Forms. For the survey design the primary data collection tool was a structured survey titled "Survey on the Regulatory Framework for the Food Industry in Nigeria". The survey explored various aspects of food safety regulations, including awareness of regulations and standards, the effectiveness of the regulatory framework and challenges faced by food manufacturers in compliance. The survey targeted a diverse range of stakeholders in the Nigerian food industry, including regulators, food manufacturers, service providers and consumers. A purposive sampling technique was used to ensure representation from all these groups. The groups and sampled sizes comprised 9 consumer groups, 6 regulators/regulatory personnel groups and 4 Food Service Providers/Food manufacturers groups. In total, the survey received responses from 19 participants. The sample size for each group was determined based on the need to obtain a range of perspectives from various sectors involved in the food industry.

Quantitative data from the survey were analysed using descriptive statistics to identify trends and patterns in the responses. Qualitative data from open-ended questions were analysed using thematic analysis to identify key themes and insights. All participants were informed about the purpose of the study and their rights as participants before they took part in the survey. Participation was voluntary and all responses were anonymized to protect participant's privacy.

Ethical consideration: The research was conducted in compliance with established ethical standards for research. All participants were informed of the study's objectives, procedures and potential hazards before their enrolment. Participants were advised that their participation was entirely voluntary and that they were free to withdraw at any time without incurring any penalties.

Anonymity and confidentiality were guaranteed; for the sake of participant's privacy, all responses were anonymized. Data were securely stored and accessed exclusively by the research team.

RESULTS AND DISCUSSION

The survey received 19 responses from various roles within the food industry as outlined in Table 1, including regulators, manufacturers and consumers, primarily from Abuja, Lagos, Kwara, Kaduna, Ogun and Oyo States/Regions. Respondents spanned across all age groups and genders.

A majority indicated awareness of food safety regulations, with approximately 53% of them indicating a high level of

awareness of food safety regulations, 42% indicating average level of awareness and 5% indicating no awareness of food safety regulations or framework in Nigeria. Similar to studies done at Klang Valley by Sofea *et al.*⁷. This supports other studies⁸ which suggest a need to increase awareness of food safety in the Nigerian food value chain and those⁹ that recommended prioritizing public enlightenment on food safety by regulatory agencies. The survey further indicated familiarity with standards from Nigeria as well as international certifications from Japan, Europe and America. However, challenges like high costs and bureaucratic hurdles were noted as barriers to compliance.

The safety of Nigerian food was questioned by some, with alternative safer countries being mentioned. As 79% of respondents believed food manufactured in Nigeria to be safe while 21% believed in other descriptions rather than unsafe up to safety standards which aligned with the findings of Aidonjio and Francis⁶, that some Nigerian food producers and vendors use harmful substances to produce, preserve and sell adulterated food that can cause food poisoning.

A mixed perception on level of implementation of established food safety policies and regulations in the country was shown in Fig. 1. The data reveal a generally positive outlook, with a majority of respondents rating the implementation as "good" or "very good". However, there is also a significant minority who perceive the implementation as "fair" or "poor", indicating areas where improvements are needed. A key implication of these findings is the need for continued efforts to enhance the effectiveness of food safety regulations in Nigeria. While the positive perceptions are encouraging, they do not suggest complacency. Ongoing efforts are necessary to address the shortcomings identified by stakeholders and to ensure that the regulatory framework remains robust and effective.

While NAFDAC, SON and NIFST are listed as known food regulatory agencies in the country with an average performance ranking of 3.5 for NAFDAC, 2.9 for SON, 2.4 for

Table 1: Characteristics of survey respondents for the study

Attribute	Count	Percentage
Role/occupation in food value chain		
Regulator	6	31.60
Manufacturer	5	26.30
Consumer	8	42.10
Gender		
Male	13	68.40
Female	6	31.60
Age group (years)		
18-24	1	5.30
25-34	3	15.80
35-44	6	31.60
45-54	7	36.80
55-64	2	10.50

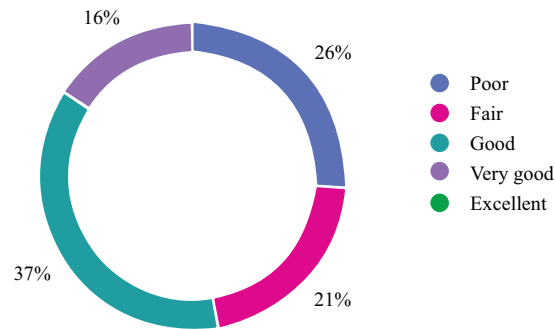


Fig. 1: Perception of level of implementation of food safety policies and regulations in Nigeria

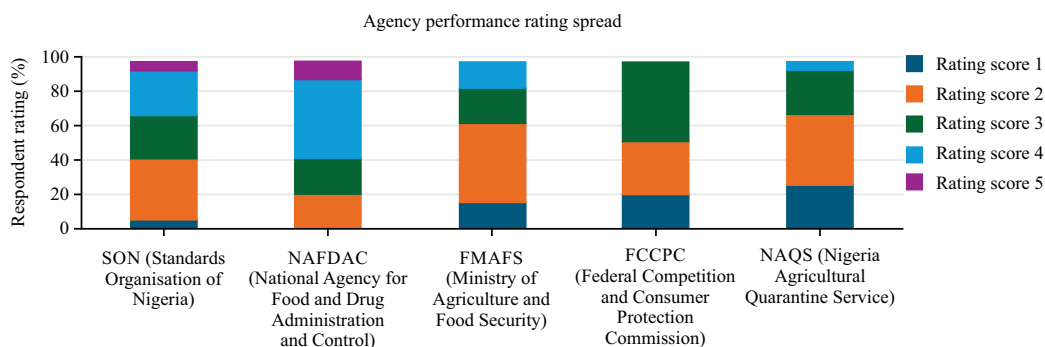


Fig. 2: Performance rating of food related agencies

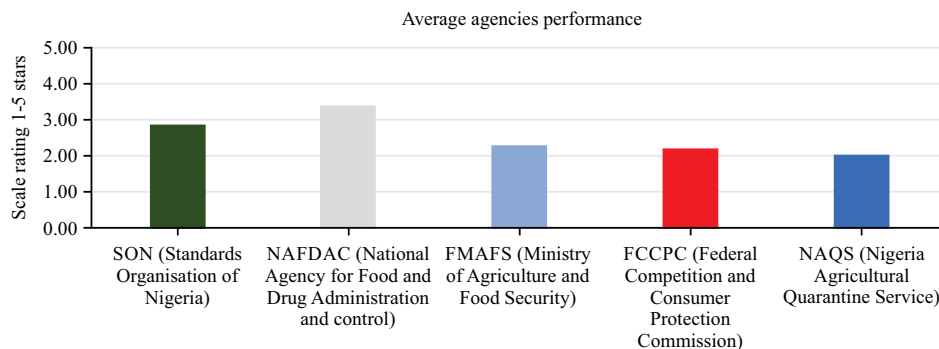


Fig. 3: Average respondents rating of related food agencies performance

FMAFS, 2.3 for FCCPC and average performance rating of 2.1 for NAQS on a scale of 5. Figure 2 illustrated the spread and rating scores in percentage.

The chart in Fig. 3 illustrated the perceived performance of various regulatory agencies involved in food safety in Nigeria. Respondents were asked to rate these agencies on a scale of 0 to 5, with 5 representing the highest level of performance. In Fig. 3. respondents ranking of the National Agency for Food and Drug Administration and Control (NAFDAC) led by received the highest rating, suggesting that

stakeholders perceive it as the most effective in its role. Standards Organization of Nigeria (SON) and the Federal Competition and Consumer Protection Commission (FCCPC) followed receiving similar ratings, indicating that stakeholders perceive them as moderately effective. While Ministry of Agriculture and Food Security (FMAFS) and the Nigeria Agricultural Quarantine Service (NAQS) lagged and received the lowest ratings, suggesting that stakeholders perceive them as less effective in their respective roles. As 64% of the respondents assessed the current regulatory framework in

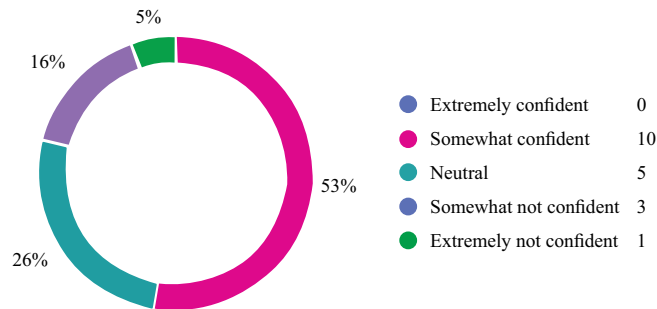


Fig. 4: Safety perception of food products in Nigerian markets

ensuring compliance with food safety standards as effective while 20% of them assessed it as ineffective although 16% were indifferent in their assessment.

There was 53% confidence in the safety of the food products available in the Nigerian markets and about 20% lack of confidence in the food products in the market from responses as seen in Fig. 4 and different from the suggestions of Onyeaka *et al.*⁵ that food safety in Nigeria is a significant public health issue, particularly in areas where regulations are poorly enforced. The confidence levels also differ from some other studies of Miftari *et al.*¹⁰ done in Kosovo where very low confidence was reported while the level has strong similarities with studies conducted among young people in Poland¹¹. Similarly, 63% of overall respondents indicated there was no difficulty in obtaining relevant food safety certifications in Nigeria while 5% stated it was difficult to obtain food safety certifications in Nigeria.

Respondents suggested increasing consumer awareness and introduction of the use of verification code to determine the safety of food before purchasing by customers similar to recommendations of other publications Su *et al.*¹², mass media marketing and awareness drive using promotion from schools, religious institutions and media platforms. This can be equated to enhancing automation and maximizing the use of ICT in food safety as in the case reported in South Korea¹³. They also suggested harmonization of regulatory framework and training of local community authorities on food safety, hygiene and control. There were also suggestions for single streamlining certification and not multiple certifications on food safety and not to make food safety about revenue generation while having strict independent processes to checkmate corruption at all levels similar to findings of Ukwueze⁹. The findings of this study highlight significant gaps in the awareness, knowledge and enforcement of food safety regulations among stakeholders in Nigeria. The limited

awareness and understanding of specific regulations suggest a need for more targeted and comprehensive public education campaigns. Additionally, the perceived ineffectiveness of regulatory enforcement points to systemic issues such as corruption and resource constraints (as similarly elucidated in other research)¹⁴ that need to be addressed to enhance compliance and safeguard public health. Comparing these findings with similar studies in other developing countries reveals common challenges, including the informal nature of food businesses and the need for capacity building among regulatory officials, identifies the core challenges include gaps in the dissemination of relevant information, the cost of implementing food safety programs and poor capacity and coordination among food regulatory institution⁵.

CONCLUSION

This empirical study provides valuable insights into the perceptions of food safety regulations among stakeholders in Nigeria. The findings show stakeholders recognize the various agencies' strides and underscore the need for increased awareness, stronger regulatory enforcement and enhanced collaboration between regulatory agencies and food industry stakeholders. By addressing these challenges, Nigeria can improve its food safety standards and protect public health more effectively. The study underscores the importance of a multi-faceted approach to improve food safety, involving all stakeholders from policymakers to consumers and the current perception regarding food safety within Nigeria. Future research should focus on larger and more diverse samples to validate these findings and explore regional variations in perceptions of food safety regulations. Additionally, longitudinal studies could provide deeper insights into the impact of implemented recommendations on food safety outcomes over time.

SIGNIFICANCE STATEMENT

The study was necessary to fill a critical knowledge gap in evaluating the food safety regulatory framework to determine where improvements are needed to ensure effectiveness and meet consumer needs, especially for countries like Nigeria where food fraud and safety violations pose a growing risk to public health. A comprehensive analysis of regulations and compliance challenges is needed. The study's empirical approach, which uses qualitative and quantitative data from food sector players like regulators, manufacturers and consumers to provide a holistic view of the regulatory landscape, is unique. It highlights compliance barriers like high costs and bureaucratic hurdles and offers actionable recommendations to improve regulatory effectiveness and Nigeria's food safety framework, enhancing academic understanding.

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