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Implementation of Food Safety Policies and Laws in Ibadan, Nigeria: Assessment of Impacts and Stakeholders' Responses

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Abstract

Background: Food plays a very crucial role in sustaining the continued existence of all living creatures. Hence, issues of food safety must be promoted to ensure sound nutrition and health. **Aim:** This study investigated the impact of implementation of food safety policies and laws in Ibadan, southwestern Nigeria. **Methods:** Structured questionnaires were used for data collection from selected local government areas (LGAs) in Ibadan metropolis**. Findings:** Results revealed that 36.9% (116) and 63.1% (198) of the respondents were male and female, respectively, with majority, 218 (69.43%), being between the age-group of 18-30 years. Among respondents from local governments, 123 (39.2%) were from Akinyele LGA, 113 (36.0%) from Ibadan North LGA, 21 (6.6%) from Ido LGA, 9 (2.9%) from Ibadan-North-East, 8 (2.5%) from Ibadan North-West LGA, 7 (2.2%) from Ibadan South-West, 5 (1.6%) from Egbeda LGA, 4 (1.3%) from Ibadan South-East, while 9 (2.95%) from other areas. Most of the respondents were from Akinyele LGA. As per educational level, 238 (75.8%) of the respondents had tertiary level of study, 36 (11.5%) had secondary level of schooling, 32 (10.2%) had professional certification as their highest level of education, 5 (1.6%) had primary school level of study while the remaining 3 (0.9%) had no formal education. The study showed that among the current food safety laws and policies in operation in Ibadan, evaluation of principles of Food Safety Act was found to be the most implemented by the individuals concerned (vendors and customers) with mean score of 13.5, followed by official control of safety of food and feed (12.6), then laws and policies for requirements for food and feed safety (8.6). Likewise, the law and policies pertaining to investigation of registration and licensing of establishments (8.1) was functional, as well as evaluation of emergencies and crisis (5.4), official testing and reference laboratories (5.4) and evaluation of the responsibilities (5.0). **Conclusion:** The study revealed significant roles of laws and policies that could aid the practices and management of food safety matters in Ibadan, southwestern Nigeria. Further studies are recommended to cover wider populations and geographical areas.

Keywords: Food safety policy, Regulations and Acts, Hygiene, Ibadan LGAs

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1. Introduction

Food safety issues have currently taken centre stage in human affairs because of prevalent high mortality and morbidity rates experienced as a result of technological and other inputs into production, processing and handling of food. The need for formulation and adoption of an effective and efficient food safety policy and laws cannot be over-emphasized. The index for determining food security includes, among others, the household ability to buy enough wholesome food, with adequate quality and appropriate nutritional value required by adults and children (Osundahunsi *et al.*, 2016). All countries need adequate food control programs to ensure that national food supplies are safe, of good quality and available in adequate amounts at affordable prices to ensure an acceptable nutritional and health status for all population groups (Enujiugha *et al.*, 2023). The mandatory requirement to use Hazard Analysis and Critical Control Points (HACCP) systems in all countries need to be considered, strengthened and utilized by our food control agencies. Food control includes all activities carried out to ensure the quality, safety and honest presentation of the food at all stages from primary production, through processing and storage, to marketing and consumption. Food control is linked to improvement in the health of the population, potential for a country specific economic development and reduction of spoilage and food

losses. Some of the important parameters in the measurement of food safety include: preventing food from contamination with pathogens that spread to humans, animals and pests; separating raw materials from processed foods to minimize re-contamination; cooking foods at optimal time and temperature conditions to destroy pathogens; storing foods at appropriate temperatures; and utilizing potable water and safe raw materials. Rates of infection, as well as viral loads and opportunistic infections, significantly increase with manifestation of both acute and chronic malnutrition, which lower immunity.

Available records show that more than $100 billion is lost to unsafe and unwholesome food in less developed countries as at the end of 2022, increasing cost on health and hospitalization (WHO, 2022). It is to be noted that the over-reliance on chemical fertilizers, and synthetic herbicides, some of which are developed from fossil fuels, has made agricultural produce a major source of biological and chemical contamination. However, new crop varieties/accessions and biocontrol agents have been utilized towards significant reductions in reliance on pesticides, thereby reducing farmers' crop protection costs and benefiting both the environment and public health. The quality of food products and food crops can be modified and optimized to meet the nutritional and health needs of compromised populations resident in most of the developing countries. High rates of malnutrition, infectious diseases, as well as non-communicable, diet-related diseases such as diabetes and hypertension, are prevalent in many developing countries (Esan *et al.*, 2024). These are as a result of compromised immune function, inadequate sources of nutritious and quality foods and limited access to healthy and suitable foods. Biotechnology and genetic modification techniques are currently being optimized for the production and development of healthy foods, and improvements in the levels and activity of biologically-active components (phytochemicals) in food crops (Enujiugha, 2020).

One of the simplest measures that any country can have to prevent the spread of food borne illness is to properly establish food safety policy and regulations for enforcing food laws and codes of practices. Development of effective and efficient food safety laws in less developed countries is major to this challenge. In the current practice of modern agriculture which relies on high inputs such as fuel-powered tractors, chemical fertilizers and chemical pesticides, deploying a smart mix of farming techniques using genetic engineering and biotechnology, as well as integrating same into the traditional smallholders farming system offer a bright prospect of meeting the growing demand for food by improving both yield and nutritional quality of crops and reducing the impact on the environment (Enujiugha, 2017). Other tools of particular importance are the standards regarding food hygiene and food safety (ISO 22000), but there are also other important systems such as quality management (ISO 9001) and Environmental management (ISO 14001). The application of modern biotechnology has highlighted its positive impact on agriculture, human health and the environment through increased crop yields, the reduced use of pesticides and herbicides, production of nutritionally enhanced foods and affordable vaccines (Osundahunsi *et al.*, 2016). There is also the need for better hygiene training among various stakeholders (Acikel *et al.*, 2008), as a way towards creating more awareness of food safety.

It has been established that the spoilage and contamination of food has not really received the desired attention in sub-Saharan states due to poor regulatory practices and low advocacy about food safety laws and policies (Udomkun *et al.*, 2018). An examination of the Food Systems Framework (Figure 1) shows the food system outcomes are impacted by various factors. Some impacts are attributed to anthropomentric inputs into the environment (Fagbemi *et al.*, 2023; Enujiugha and Nwanna, 2004), some are concerned with water pollution (Enujiugha *et al.*, 1994), and yet others are a fallout of biodiversity management (Enujiugha, 2017). Some other impacts could also be tied to the innate composition of the food produce and products (Stadlmayr *et al.*, 2012; Sanusi *et al.*, 2017). In this study stakeholders drawn from critical sectors were presented with questions relating to knowledge, perception and implementation of food safety policies and laws in Ibadan, Nigeria.

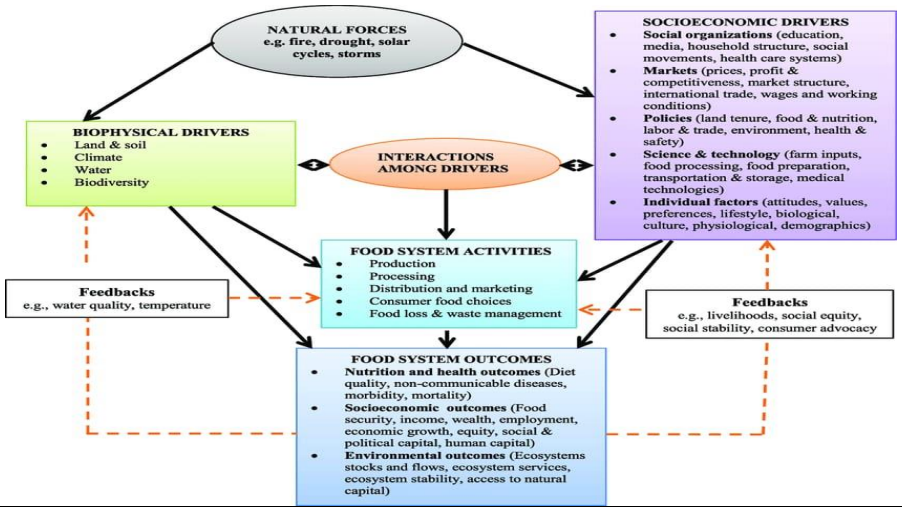

Figure 1: The food systems framework showing the impacts of different variables on the food system outcomes with safety implications (Source: Enujiugha and Nwanna, 2004; Enujiugha, 2017)

2. Materials and Methods

Research instruments and scope of study

Materials used in this study included structured questionnaires, interview and focus group discussions which were conducted to investigate the study objectives under the following schemes: (i) Evaluation of Oyo State Food safety policy and laws (Scientific Basis for Food Safety Measures; Risk Communication; Risk Management; Precautionary Principles and Transparency), (ii) Requirements for Food safety and Quality procedures, (iii) Investigation of Registration and Licensing of Establishments (Registration of establishments; Licensing of establishments; License conditions, suspension cancellation), (iv) Evaluation of the responsibilities of food operators in Oyo State (Responsibilities in relation to unsafe food; Requirements for traceability of food), (v) Investigation of food declarations and labelling (False and misleading descriptions), (vi) Official control of safety of food (Official control of safety of food; General principles of inspection; Content of inspection; Health and hygiene inspection of persons in contact with food; Sampling of laboratory analysis; Annual food safety control plan and report; Imported and exported food and feed), (vii) Official Testing and Reference Laboratories (Review official testing laboratory conditions; Review of official reference laboratories), (viii) Evaluation of emergencies and crisis management (Emergency measures for ensuring safety of food and feed; General Plan for Crisis Management) and (ix) Review of the Oyo State Public Health Law (CAP 135) Food, Water and Water related products. Nordhagen (2022) observed that 69% of food safety studies in Nigeria used a single data-collection method, most commonly an individual-level structured survey.

The study was conducted in Ibadan bringing together stakeholders from the public and private sectors of the state. These include but not limited to ministries, departments and agencies of government, non-governmental organizations and private sector. Others are stakeholders in the academia, professional associations, women groups and development partners.

Sample size and experimental design

A total of 386 copies of a questionnaire were administered, calculated using the sample size formula:

$n=N/1+N*(e)2$

n= the sample size, N= population size and e=acceptable sampling error.

The study layout followed the completely randomized design (CRD) experimental setup, without any definite order for gender categorization and age distribution of the respondents. Level of education, income level and marital status were also used to categorize the respondents, based on simple randomization.

Statistical analysis

All the experimental data and responses were entered on Microsoft Excel and analyzed using Statistical Package for Social Sciences (SPSS) version 26.0.

3. Results and Discussion

Table 1 reveals that 116 males (36.9 %) and 198 (63.1%) females participated in the study. A total of 218 (69.43%) of the respondents were within the age group 18-30 years, 79 (25.16%) were within the age group 31-40 years while the remaining 17 (5.41%) of the respondents were within the age group greater than 41 years. A bulk of the respondents were within the age-group of 18-30 years. 238 (75.8%) of the respondents have tertiary levels of education, 36 (11.5%) have secondary education as their highest level of education, 32 (10.2%) have professional certification as their highest level of education, 5 (1.6%) have school leaving certificate as their highest level of education while the remaining 3 (0.9%) signifies those that didn't attend any school. Most of those that participated in the study have tertiary education as their highest level of education, which is an advantage in maintaining adequate awareness of food safety practices (Auad et al. 2019). About 188 (59.9%) of the respondents earn above minimum wage while 126 (40.1%) indicates that they earn below the minimum wage. Majority of the respondents earn above Nigerian minimum wage scale. 198 (63.1%) of the respondents are identified to be singles, 112 (35.75) signifies as married, 3 (1.0%) divorced while the remaining 1 (0.3%) are separated from their partners.

Table 2 reveals that 123(39.2%) of the respondents are from Akinyele local government, 113(36.0%) are from Ibadan North local government area, 21 (6.6%) are from Ido local government, 9(2.9%) are from Ibadan-North-East, 8 (2.5%0 are from Ibadan North-West local government, 7(2.2%) are from Ibadan South-West and Egbeda local government area, 5(1.6%) are from Ibadan South-East, 4(1.3%) while 9(2.95%) of the respondents signifies other local government area in Oyo State. Most of the respondents are from Akinyele Local Government. The report of Liverpool-Tasie *et al.* (2024) points to the need for contextualized approaches that are informed by not only cost-benefit calculations but also experiential approaches that push decision makers to understand issues from the perspective of those most proximate to the issue. The present study followed the principle of closer-tied stakeholders' perceptions, concentrating on areas where the stakeholders are more informed about policy implementation.

It is evident from Table 3 that among the current food safety laws and policies in operation in Ibadan, Oyo State Nigeria, Evaluation of Principles of food Safety Act in Ibadan is found to be the most observed by the individuals concerned: vendors and customers with mean score of 13.5, followed by official control of safety of food and feed (12.6), then laws and policies for requirement for food and feed safety (mean=8.6). Likewise, the law and policies pertaining to investigation of registration and licensing of establishments (mean=8.1) is functional as well as Evaluation of Emergencies and crisis (mean=5.4), Official testing and reference laboratories (mean=5.4) and Evaluation of the responsibilities (5.0). According to Eruaga (2024), in addition to promoting sustainable agricultural practices, policy strategies for managing food safety risks also focus on strengthening food safety systems and enhancing surveillance and monitoring mechanisms.

Table 1: The collated bio data of the respondents

Features	Frequency	Percent	Cumulative %
Sex			
Male	116	36.9	36.9
Female	198	63.1	100.0
Total	314	100.0	
Age			
18-30	218	69.43	69.43
31-40	79	25.16	94.59
>41	17	5.41	100.0
Total	314	100.0	
Level of Education			
No formal Education	3	0.9	0.9
Primary Education	5	1.6	2.5
Secondary Education	36	11.5	14.0
Tertiary Education	238	75.8	89.8
Professional Certification	32	10.2	100.0
Total	314	100.0	
Monthly Income			
Above minimum wage	188	59.9	59.9
Below minimum wage	126	40.1	100.0
Total	314	100.0	
Marital Status			
Married	112	35.7	35.7
Single	198	63.1	98.8
Divorce	3	1.0	99.7
Separated	1	.3	100.0
Total	314	100.0	

Table 2: Distribution of participants among the local government areas within Ibadan metropolis

Local Government Area	Frequency	Percent	Cumulative Percent
Ibadan North	113	36.0	36.0
Ibadan North-East	9	2.9	38.9
Ibadan North-west	8	2.5	41.4
Ibadan South-East	5	1.6	43.0
Ibadan South-West	7	2.2	45.2
Akinyele	123	39.2	84.4
Egbeda	7	2.2	86.6
Ido	21	6.6	93.2
Lagelu	4	1.3	94.5
Ona Ara	4	1.3	95.8
Oluyole	4	1.3	97.1
Others	9	2.9	100.0
Total	314	100.0	

Table 3: Participants responses and perception of the current food safety policies in Ibadan

Laws and Policies	Mean	Std. Deviation
Evaluation of Principles of food Safety Act in Ibadan	13.5	2.96374
Requirement for Food and feed safety	8.6	2.04119
Investigation	8.1	1.92007
Evaluation of the responsibilities	5.0	1.43905
Official control of safety of food and Feed	12.6	3.27899
Official testing and reference laboratories	5.4	1.28770
Evaluation of Emergencies and crisis	5.4	1.08572

Table 4: Challenges associated with food safety polices in Ibadan, Oyo State, Nigeria

Challenges associated with food safety and laws	Frequency	Percentage	Ranking
Policy/Legislation/Regulation	100	31.8	4
Political Connections	53	16.9	8
Financial Resources	132	42.0	1
Physical Resources (infrastructure, etc.)	95	30.3	5
ICT	82	26.1	7
Training and Capacity Building	105	33.4	2
Human resources	89	28.3	6
Technical Expertise	101	32.2	3

Table 5: Effective strategic approaches to execution of food safety policies in Ibadan

Strategies approaches to execution	Frequency	Percentage	Ranking
Familiarity about all projects	64	20.4	4
Participation in engagements by stakeholders	59	18.8	6
Active participation in workshops for improvements	71	22.6	3
Digitalization	61	19.4	5
Interactions with project members	54	17.2	7
Active involvements in fieldwork	100	31.8	2
Publicity/information dissemination	109	34.7	1

By promoting environmentally friendly packaging and hygiene practices, such policies can help minimize the occurrence of foodborne pathogens and chemical contaminants in food products, thereby enhancing food safety (Olowolafe *et al.*, 2024; Enujiugha and Oyinloye, 2019).

Table 4 shows that among the suggested challenges associated with food safety and laws in Ibadan, Oyo State Nigeria, Financial Resources was the most prominent as 132 (42.0%) of the respondents ascribed to this notion, followed by lack of training capacity building of the personnel in-charge as highlighted by 105 (33.4%) of the respondents, then deficiency of technical expertise as indicated by 101 (32.2%) of the respondents. 100 (31.8%) of the respondents believed that policy/legislation/regulations itself is not well structured to fit the peculiarity of Ibadan, Oyo State Nigeria. This agrees with the observation of Nordhagen (2022) that directly engaging local stakeholders will achieve more meaningful result as regards food safety issues. Physical resources (infrastructure) are a perceived challenge by 95 (30.3%) of the respondents. 89 (28.3%) of the respondents were of the opinion that there is laxity in the human resource. 82 (26.1%) of the respondents believed that lack of ICT contributes to the challenges associated with food and feed laws in Ibadan, Oyo State Nigeria while 53 (16.9%) of the respondents are of the opinion that political connections is a major challenge.

Table 6: Perception of Roles of Government Agencies and Ministries, Department, and Agencies (MDAs) in Enforcement of Food Safety Policies

Roles of MDAs on food safety polices	Frequency	Percentage	Ranking
Influence/Impact	30	9.6	4
Policies	19	6.1	8
Laws promotion/enactment by the legislature	51	16.2	1
Campaign/advocacy	31	9.9	5
Capacity to decide	38	12.1	2
Adherence/compliance	20	6.4	6
Adherence/enforcement	9	2.9	1
Execution	22	7.0	7
Project implementation	19	6.1	8
Participation through R & D	11	3.5	10
Monitoring and Evaluation	10	3.2	11
Politics	32	10.2	3
Networking	7	2.2	12
Resource mobilization	15	4.8	9

Table 5 reveals that among the suggested effective approaches to the implementation of food safety policies, information dissemination is found to be paramount with 109 (34.7%) of the respondents attesting to this. This is likewise evident as a significant number of individuals belonging to organizations promoting food safety law and policies signifies to conduct "awareness programs" with the populace. This is followed by promotion of volunteerism. 100 (31.8%) of the respondents believe that voluntary participation in fieldwork will be a good strategy to execute food safety policies. Among other suggested approaches includes: involvement in relevant planning/ designing of workshops as indicated by 71 (22.6%) of the respondents. Also, regular updates about ongoing projects are suggested by 64 (20.4%) of the respondents. 61 (19.4%) of the respondents highlighted digitalization (webinars, shared documents) relating to food safety will contribute to the effective implementation of food safety. Attending stakeholders' meeting also surfaced as it accounted for 59(18.8%) of the respondents while personal dialogue with personal staff was seen to be the least of all suggested effective approaches to the implementation of food safety as it was 54 (17.2%) of the respondents' opinion. For instance, keeping updated information about the safety of Nigerian produce vis-à-vis acceptance in international trade is a current trending issue (Enujiugha *et al.*, 2023).

Table 6 shows the perception of roles of government ministries, department, and agencies (MDAs) in enforcement of food safety policies, as well as evaluation of principles of Food Safety Act in Ibadan, Oyo State, Nigeria. Majority strongly disagree that there are good scientific basis (65%) and risk communication (47%) for Food Safety Measures in Ibadan respectively while 65% agree and describe Oyo State Government as being transparent on food safety. Liverpool-Tasie *et al.* (2024) highlighted the importance of beliefs in the agrifood system policymaking process and emphasized the need to explore not only the existence but also the source of divergent beliefs among policy actors in greater depth. Suggestions could be proffered as to what would help respondents to support the successful implementation food safety policies in the state. Hygiene education, obtaining up to date o is what majority 40% believe will motivate them to support/ collaborate on the implementation of the food polices in Ibadan, Oyo State, Nigeria.

With regard to knowledge and perceptions of food safety policies, 42% of the participants are fully aware of food safety policies but only 10% (31) are familiar with and believe that hand washing is the only food hygiene practice that should be adhere to. The recent introduction of waste valorization and value addition could help in achieving effective food safety management systems, and increase awareness among stakeholders. For example, by converting food and agricultural waste to useful industrial product (Oludumila *et al*, 2015), this is expected to enhance participation via research and development efforts and strategies.

4. Conclusion

This study revealed, among other findings, that effective approaches to the implementation of food safety policies is crucial in Ibadan, Oyo State, Nigeria. It also described the challenges associated implementation of food safety policies and laws, including operations and roles of Government Ministries, Departments, and Agencies (MDAs) having mandate on food safety and policies. The study addressed the issue of adequate evaluation of principles of food safety act and knowledge and perceptions of food safety policies in Ibadan Oyo State Nigeria. Further studies are recommended to cover wider geographical areas, particularly the additional 22 local governments in Oyo state that were not covered in this pioneering study.

Conflicts of Interest

Authors declare that there is no conflict of interest

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