*ID: 777*

# Knowledge Level Of Crop Farmers On Food Safety Practices In Ogbomoso Agricultural Zone Of Oyo State Nigeria

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## Abstract

The study assessed crop farmers' knowledge of food safety practices in Ogbomoso Agricultural zone of Oyo State, Nigeria. It specifically examined farmers' socio-economic characteristics, production practices associated with food safety risks, information sources as well as barriers to adoption of the food safety practices. Data were collected from 144 crop farmers using structured interviews and analyzed using descriptive statistics (frequency, percentage, mean) and Pearson Product Moment Correlation (PPMC) to test relationships. Findings showed a mean age of 47 years and an average household size of nine persons. A large proportion (75%) lacked access to health extension workers, indicating weak institutional support. Key risky practices included drying crops on bare ground, use of untreated animal manure, and use of contaminated water. Major information sources were mass media channels such as radio drama, SMS, and television, while formal extension agents, NGOs, and religious organizations were less frequently accessed. Overall, respondents demonstrated relatively high knowledge of safe post-harvest handling, storage, and appropriate agrochemical use. However, adoption of the food safety practices was constrained by mistrust of modern food safety practices, financial limitations, and cultural traditions. Poor adherence to food safety was reported to negatively affect productivity, income, and social relations. Significant positive relationships were found between food safety knowledge and age ($r = 0.363$, $p = 0.002$), education ($r = 0.507$, $p < 0.001$), and household size ($r = 0.484$, $p < 0.001$). The study concludes that despite relatively high knowledge levels, structural and institutional gaps particularly limited extension services hinder effective food safety practice adoption. It recommends strengthened agricultural and health extension services to provide continuous training on Good Agricultural Practices (GAP), safe agrochemical use, and improved water and post-harvest handling practices.

***Keywords:*** *Knowledge level, Crop production, Crop farmers, Food safety, Food safety practices*

## Introduction

Food, a basic necessity of life, derives its importance from the fact that it stimulates appetites, supplies a variety of ingredients that give energy, replace worn-out tissues, thus promoting growth and help in preventing and curing diseases (Okojie and Isah, 2019). Food safety refers to all the procedures and conditions used to guarantee that food is safe, wholesome, and suitable for human consumption, from the point of production to the point of consumption. A sustainable food system must prioritize food safety in order to guarantee that consumers have access to wholesome food (World Health Organization, 2023).

However, the manifold sources of food and the processes it undergoes before it is eaten create a fairly high probability that it might become an infective agent (Christiana *et al*., 2022). Food, through improper handling, could be a source of infection leading to illness and diseases, poor health, and reduced productivity (Federal Ministry of Health, 2015). Food must be treated carefully to protect human health since it is the most vital and only material that all humans and animals must ingest in order to survive. Anywhere in the food chain, contamination can have serious and occasionally lethal repercussions. However, Nigerian home crop growers have little knowledge of food safety, and over 91 million people worldwide including those in Africa are afflicted by food-borne illnesses each year, with about 137,000 deaths attributable to these illnesses (Cissé, 2019), over 70% of instances of diarrheal infection in underdeveloped countries originated in foodborne infections due to inadequate food safety procedures and the use of unwholesome food.

In addition to causing health problems, unsafe food can also have a negative economic impact through hospital expenses and lost revenue from foreign trade (Awoyemi *et al*., 2019). There is an urgent need to evaluate how agricultural techniques affect food safety as they change to satisfy the world's expanding food demands, especially in light of new worries about environmental contaminants, pesticide residues, and microbiological contamination (Usman, 2024). On this note this study specifically ascertained the socio-economic characteristics of the respondents, determined crop production practices linked to food safety concern, identify sources of information on food safety practices and determined the barriers to usage of food safety practices

## Methodology

This study was carried out in Ogbomoso Agricultural Zone of Oyo State. The study makes use of multi-stage sampling technique. First stage involved purposive selection of two (2) extension blocks out of 5 blocks in the zone, Surulere and Oriire blocks were purposively selected because of the level of their rurality and high concentrations of crop farmers. Second stage involved random selection of three (3) cells in selected blocks. From Oriire block; Ajinapa, Tewure and Ahoro-dada were randomly selected, while Iresadu, Iresaapa and Baya-oje were selected from Surulere block. Third stage involved selection of 24 crop farmers from each selected cells, using simple random sampling, making 144 crop farmers to form the sample size for this study. The dependent variable is knowledge level of crop farmers on food safety practice was measured on a four (4) point rating scale of Adequate knowledge= 3, Basic knowledge= 2, Minimal knowledge= 1 and No knowledge= 0.

## Results and Discussion

***Socio-economic characteristics of the respondents***

Data presented in Table 1 shows the distribution of the respondents according to their socio-economic characteristics. 8.4% of the respondents were less or equal to 30 years of age, 26.5% were between the age of 31-40 years, 27.8% were between 41-50 years of age, 21% were between 51-60 years, 16.7% were 61 years and above. With a mean age of 47 years, it implies that the respondents were within the economic active age group and will be able to cope with the rigours associated with crop production. Also, it was observed that 58.3% of the respondents were male, 41.7% were female, 6.9% of this respondents were single, 5.6% were separated, 1.4% claimed to be divorced, 5.6% were widow while majority (80.6%) were married, this implies that family as an institution is not left out in the pursuit of food safety practices, this agrees with the submission of (Udoh, 2020) that any interventions aimed at families in the pursuit of food safety practices would favour households' ability to reduce food contamination.

Table 1: Distribution of the respondents according to their socio-economic characteristics n=144

| *Socio-economic characteristics* | *Frequency* | *Percentage* | *Mean* |
|---|---|---|---|
| Age | | | |
| ≤30 | 12 | 8.4 | |
| 31-40 | 38 | 26.5 | |
| 41-50 | 40 | 27.8 | 47 years |
| 51-60 | 30 | 21.0 | |
| 61 and above | 24 | 16.7 | |
| Sex | | | |
| Male | 84 | 58.3 | |
| Female | 60 | 41.7 | |
| Marital status | | | |
| Single | 10 | 6.9 | |
| Separated | 8 | 5.6 | |
| Divorced | 2 | 1.4 | |
| Widow | 8 | 5.6 | |
| Married | 116 | 80.6 | |
| Academic qualification/ Years spent in school | | | |
| Primary school completed | 72 | 50 | |
| Secondary school completed | 58 | 40.3 | 9.08 |
| Tertiary education | 14 | 9.7 | |
| Household size | | | |
| ≤5 | 30 | 20.9 | |
| 6-10 | 64 | 44.4 | 9 people |
| 11 and above | 50 | 34.8 | |
| Annual income (₦) | | | |
| ≤500,000 | 96 | 66.7 | |
| 500,000 – 1000,000 | 18 | 12.6 | ₦ 2137120 |
| 1000,000 and above | 30 | 20.9 | |
| Membership of Social Organization | | | |
| Yes | 86 | 59.7 | |
| No | 58 | 40.3 | |
| Access to Health Extension Worker | | | |
| Yes | 108 | 75.0 | |
| No | 36 | 25.0 | |

Source: Field Survey, 2025.

Also, 50% of the respondents completed primary school education, 40.3% completed secondary school education, 9.7% had tertiary education, 20.9% of the respondents had an household size of less or equal to 5person, 44.4% had between 6-10, 34.8% had 11 and above individuals in their household. The mean household size of 9 suggests that respondents in the study area may experience difficulty complying with recommended food safety practices due to large family sizes. This finding corroborates the submission of (Vihi, Daudu and Anonguku, 2020) that households with many family members may not fully adhere to routine food safety practices because of overcrowded living conditions.

Furthermore, Table 1 revealed that 66.7% of the respondents earns less or equal ₦500,000 annually, 12.6% earns between ₦500,001 - ₦ 1000,000, annually, while 20.9% earns ₦1000,001 and above, with a mean annual income of ₦1362638.89. Also, 59.7% of the respondents claimed to belong to one social organization or the other, while 40.3% does not. Lastly on Table 1, 75.0% of the respondents claimed not to have access to health extension workers in the study area, this indicate that health extension work in the study is not frequent.

***Crop production practices linked to food safety concern***

Table 2 shows the distribution of the respondents according to Crop production practices linked to food safety concern. Using Weighted Mean Score, these practices were ranked. The habit/ practice of Drying crops on bare ground ranked first with a WMS of 1.49, Use of untreated or fresh animal manure ranked second with a WMS of 0.94, Use of contaminated water ranked third with a WMS of 0.85, Harvesting immature or stressed crops ranked fourth with a WMS of 0.64, Improper post-harvest handling ranked fifth with a WMS of 0.42, Wildlife and livestock access to fields ranked sixth with a WMS of 0.33, Overuse or misuse of fertilizers ranked seventh with a WMS of 0.31, High chemical input ranked eighth with a WMS of 0.24, Improper use of Pesticide ranked ninth with a WMS of 0.22, Inadequate pest control during storage ranked tenth with a WMS of 0.08. This result implies that the habit of Drying crops on bare ground, use of untreated or fresh animal manure and use of contaminated water were the top Crop production practices linked to food safety concern. This finding agrees with previous Nigerian studies which identified the use of contaminated irrigation water, untreated manure, and unsafe crop handling practices as major contributors to food safety risks in crop production. Akinde *et al.,* (2016) and Kurna *et al.,* (2016) reported that vegetables irrigated with contaminated water sources in Nigeria harbored pathogenic microorganisms.

Table 2: Distribution of the respondents according to Crop production practices linked to food safety concern

| *Practices ** | *WMS* | *Rank* |
|---|---|---|
| Improper Use of Pesticides | 0.22 | 9th |
| Use of Contaminated Water | 0.85 | 3rd |
| Use of Untreated or Fresh Animal Manure | 0.94 | 2nd |
| Improper Post-Harvest Handling | 0.42 | 5th |
| High Chemical Input | 0.24 | 8th |
| Wildlife and Livestock Access to Fields | 0.33 | 6th |
| Overuse or Misuse of Fertilizers | 0.31 | 7th |
| Harvesting Immature or Stressed Crops | 0.64 | 4th |
| Drying Crops on Bare Ground | 1.49 | 1st |
| Inadequate Pest Control During Storage | 0.08 | 10th |

Source: Field Survey, 2025; *Multiple responses

***Source of information on food safety practices***

Table 3 shows the distribution of the respondents according to source of information on food safety practices. It was observed that respondent got information from different sources in the study area, 94.4% of the respondents claimed radio drama as a source of information, 43.1% claimed television, 2.8% claimed health extension workers, 62.5% claimed information from mobile SMS, 18.1% claimed NGOs, 23.6% claimed family and friends, 1.4% claimed religious group. This implies that radio drama, mobile SMS and television were the frequent source of information on food safety practices, while religious group, NGOs and health extension workers were less frequent source of information. Summarily, this result is an indication that health extension services, which supposed to be at the forefront of this crusade is less frequent in the study area. This agreed with the findings of Adeyeye *et al.,* (2024) who reported that radio programmes delivered in indigenous languages had greater reach and behavioural influence among rural populations than direct contact with extension workers, whose services were less accessible to many respondents.

***Knowledge level of crop farmers on food safety practice***

Table 4 shows the distribution of the respondents according to their knowledge level on food safety practice. Using Weighted Mean Score, respondent demonstrated high knowledge level of Understanding of safe post-harvest handling, drying and storage method to minimize contamination and loses as it ranked first with a WMS

of 1.87, Compliance with local, national and international regulation and standards on food safety ranked second with a WMS of 0.97, Proper use of agricultural chemical ranked third with a WMS of 0.94, Understand specific food safety risks associated with agricultural water and soil amendments ranked fourth with a WMS of 0.90, Food safety training and education ranked fifth with a WMS of 0.04, knowledge on Proper waste management ranked sixth with a WMS of 0.04, Understanding and implementing good agricultural practices to ensure food safety ranked seventh with a WMS of 0.01, Proper hygiene practices ranked least in eighth with a WMS of 0.01. This implies that respondents demonstrated high knowledge level of safe post-harvest handling, drying and storage method to minimize contamination and loses, Compliance with local, national and international regulation and standards on food safety and Proper use of agricultural chemical. This finding agrees with the study conducted by Otekunrin *et al.,(2023)* who reported that increased awareness and training on food safety practices significantly improved farmers' knowledge of proper storage, chemical application, and post-harvest management techniques in Nigeria.

Table 3: Distribution of the respondents according to Source of information on food safety practices

| *Sources* | *Frequency* | *Percentage* |
|---|---|---|
| Radio drama | 136 | 94.4 |
| Television | 62 | 43.1 |
| Health extension workers | 4 | 2.8 |
| Mobile SMS | 90 | 62.5 |
| NGOs | 26 | 18.1 |
| Family/ Friends | 34 | 23.6 |
| Religious group | 2 | 1.4 |

Source: Field survey, 2025.

Table 4: Distribution of the respondents according to their Knowledge level on food safety practice

| *Knowledge** | *WMS* | *Rank* |
|---|---|---|
| Understanding and implementing good agricultural practices to ensure food safety | 0.01 | 7th |
| Compliance with local, national and international regulation and standards on food safety | 0.97 | 2nd |
| Proper use of agricultural chemical | 0.94 | 3rd |
| Understanding safe post-harvest handling, drying and storage method to minimize contamination and loses | 1.87 | 1st |
| Proper hygiene practices | 0.01 | 8th |
| Food safety training and education | 0.04 | 5th |
| Understand specific food safety risks associated with agricultural water and soil amendments | 0.90 | 4th |
| Proper waste management | 0.04 | 6th |

Source: Field Survey, 2025. *Multiple responses

***Barriers to usage of food safety practices***

Table 5 shows the distribution of the respondents according to barriers to usage of food safety practice. 95.8% claimed Low awareness and knowledge as a barrier to usage of food safety practice, 97.2% claimed financial constraints, 95.8% claimed low literacy and education levels, 97.2% claimed Inadequate Infrastructure as a barrier, 95.8% claimed cultural and traditional practices, 100% of the respondents claimed mistrust of "modern" practices or authorities, 95.8% claimed absence of local food safety legislation enforcement as a barrier to usage of food safety practices. This implies that mistrust of "modern" practices or authorities, financial constraints and cultural and traditional practices were top barriers to usage of food safety practices in the study area. This finding is in agreement with the study of Olatunji *et al., (2022)* who reported that low trust in formal food safety interventions, coupled with poverty and adherence to traditional processing methods, significantly limited compliance with recommended food safety practices among rural households in Nigeria.

Table 5: Distribution of the respondents according to barriers to usage of food safety practices

| *Barriers* | *Frequency* | *Percentage* |
|---|---|---|
| Low Awareness and Knowledge | 138 | 95.8 |
| Financial Constraints | 140 | 97.2 |
| Low Literacy and Education Levels | 138 | 95.8 |
| Inadequate Infrastructure | 140 | 97.2 |
| Cultural and Traditional Practices | 138 | 95.8 |
| Mistrust of "Modern" Practices or Authorities | 138 | 95.8 |
| Absence of Local Food Safety Legislation Enforcement | 138 | 95.8 |

Source: Field Survey, 2025.

***PPMC analysis showing the relationship between selected socio-economic characteristics of the respondents and their knowledge level on food safety practices***

Table 6 shows that there is significant relationship between Age (r= 0.363, P= 0.002), Academic qualification (r= 0.507, P= 0.000), Household size (r= 0.484, P= 0.000) of the respondents and their knowledge level on food safety practices. This implies that age, academic qualification and household size can influence knowledge level on food safety practices. Older crop farmers are expected to have high knowledge of food safety practices, also respondents with high Academic qualification should poses high knowledge level, meanwhile, respondents with larger household might find it difficult to comply with food safety practices.

Table 6: PPMC analysis showing the relationship between selected socio-economic characteristics of the respondents and their knowledge level on food safety practices

| *Socio-economic characteristics* | *r- value* | *P- value* | *Remark* |
|---|---|---|---|
| Age | 0.363** | 0.002 | Significant |
| Academic qualification | 0.507** | 0.000 | Significant |
| Household Size | 0.484** | 0.000 | Significant |
| Annual income | -0.072 | 0.547 | Not significant |

Source: Computed Data, 2026., ** Correlation is significant at the 0.01 level (2-tailed)

## Conclusion and recommendations

Based on this research findings, it can be concluded that respondents demonstrated high knowledge level of food safety practices in the study area. Also, substantial proportion of the respondents lacked access to health extension workers, highlighting a critical gap in institutional support for food safety promotion. Crop production practices such as drying produce on bare ground, using untreated animal manure, and reliance on contaminated water emerged as major food safety risk factors, underscoring persistent exposure to biological and chemical hazards at the production stage. Also, while knowledge dissemination is occurring, it is largely mediated through informal or indirect channels rather than structured extension systems.

Based on this research findings, this study hereby suggest the following recommendations:

- Oyo state Ministry of Agriculture together with community health expert should look into synchronization of health and agricultural extension workers in the study area to provide regular, hands-on training and technical support on food safety and good agricultural practices.
- Crop farmers are encouraged to adopt safer crop production practices, including proper drying methods, use of treated organic manure, safe agrochemical application, and the use of clean water for irrigation and washing.
- Ministry of health in the state and health extension department should expand the use of radio programs, mobile SMS, and television to deliver targeted, culturally appropriate food safety messages, as these channels are already trusted and widely accessed by respondents.
- Government should also design interventions that consider financial constraints and cultural beliefs by providing affordable technologies, incentives, and community-based sensitization programs that build trust in modern food safety practices.

## Contribution to knowledge

The study contributes to knowledge by showing that farmers' awareness of food safety practices does not necessarily lead to its adoption because of structural, institutional, and socio-cultural barriers.

## References

Adeyeye, B. K., Salawu, A., & Adesina, E. A. (2024). Nexus among indigenous languages, agricultural radio programmes and behavioural change towards agricultural practices in Nigeria. Heliyon, 10(13), e33721.

Akinde, S. B., Sunday, A. A., Adeyemi, F. M., Fakayode, I. B., Oluwajide, O. O., Adebunmi, A. A., Oloke, J. K., & Adebooye, C. O. (2016). Microbes in irrigation water and fresh vegetables: Potential pathogenic bacteria assessment and implications for food safety. Applied Biosafety, 21(2), 89–97.

Awoyemi, A. O., Ajiboye, M. N., Adesiji, G. B., and Kayode, A. O. (2019). Food safety knowledge among farming households in Irepodun local government area, Kwara State, Nigeria. Agricultural Science and Technology, 11(2), 184 – 188.

Christiana, N., Nwinuka, C. V., & Edori, O. S. (2022). Molecular identification and prevalence of bacterial isolates from vegetables salad purchased from fast food centres in two local government areas in Port Harcourt Metropolis, Rivers State, Nigeria. Journal of Advances in Microbiology, 22(10), 1–14.

Cissé, G. (2019). Food-borne and water-borne diseases under climate change in low-and middle-income countries: Further efforts needed for reducing environmental health exposure risks. Acta Tropica, 194, 181-188.

FMH (Federal Ministry of Health). (2015). The National Health Policy and Strategy to achieve health for all Nigerians. Retrieved from http://www.prb.org/Publications.

Kurna, B. B., Yadima, S. G., & Usman, B. (2016). Bacteriological quality assessment of irrigation water and irrigated vegetables in Maiduguri, Borno State, Nigeria. Civil and Environmental Research, 8(11), 46–52.

Okojie, P. W. & Isah, E. C. (2019). Food hygiene knowledge and practices of street food vendors in Benin City, Nigeria. International Journal of Consume studies, 43(6), 428- 435.

Olatunji, B. O., Afolabi, O. R., & Hassan, A. T. (2022). Socio-economic and cultural factors influencing adoption of food safety practices among rural households in Nigeria. Journal of Agricultural Extension, 26(3), 45–58.

Otekunrin, O. A., Momoh, S., Ayinde, I. A., & Otekunrin, O. A. (2023). Food safety knowledge and post-harvest handling practices among smallholder farmers in Nigeria. Sustainability, 15(9), 7421.

Udoh, E. S. (2020). Assessment of food safety knowledge among households in Akwa Ibom State, Nigeria. Nigeria Agricultural Journal, 51(2), 199 206.

Usman, A. (2024). Influence of Agricultural Practices on Food Safety in Nigeria. International Journal of Food Sciences, 7(1), 43–54.

Vihi, S. K., Daudu, S., & Anonguku, I. (2020). Assessment of forestry extension service delivery among rural farmers in Plateau State, Nigeria. Asian Journal of Research in Agriculture and Forestry, 6(1), 12–24.

WHO. (2023). Compendium of WHO and other UN guidance on health and environment. https://www.who.int/tools/compendium-on-health-and-environment. accessed online on January 20, 2026.