

Food Safety Practices Among Cassava Processors in Selected Rural Communities of Ogun State, Nigeria

^{1*}Fadipe, M. O., ²Adewunmi, A. A., ³Ilori, A. R., ⁴Ogungbayi, G. B.

^{1,2,3}Department of Agricultural Extension and Rural Sociology, Olabisi Onabanjo University, Yewa Campus, Ayetoro, Ogun State, Nigeria

⁴Department of Home Science and Hospitality Management, Olabisi Onabanjo University, Yewa Campus, Ayetoro, Ogun State, Nigeria

Correspondence email address: mubarak.fadipe@oouagoiwoye.edu.ng

Abstract

Cassava being a major source of carbohydrate in most households in Ogun State, and the economic importance cannot be gainsaid. Hence, the emerging public health concerns towards processing of agricultural produces requires attention. Therefore, this study described the socio-economic characteristics among cassava processors, as well as the sources of information, attitude to food safety practices, constraints to food safety practices and the level of food safety practices used in rural areas of the state. Data were collected from 194 cassava processors through personal interview. Results show that the average age of the processors was 43 years. Majorities (73.2%) of the cassava processors were females. The cassava processors accessed information on food safety mainly through radio (2.54), fellow processors (2.39) and their family members (2.16). Inadequate finance to purchase modern equipment (1.79) was considered as the major challenge faced by respondents. Consequently, slightly more than half (56.2%) of the cassava processors had favourable attitude towards cassava food safety. Also, most (59.8%) of the respondents had high level of food safety practices in cassava processing. Furthermore, a positive and significant relationship between level of food safety practice and sources of information ($p \leq 0.05$) and processors' attitude to food safety practices ($p \leq 0.05$) existed. Thus, extension unit with the mandate of serving women in agriculture should be enhanced to serve and train the processors accordingly so as to sustain and improve the food safety practices used and as well transform the attitude of the processors into a better food safety practice in the study area.

Key words: Food, Safety, Safety Practices, Cassava Processors, Rural.

Introduction: Cassava is a major staple crop that can be processed into diverse products for human consumption in Nigeria. However, improper and unwholesome processing practices and lack of knowledge of food safety practices by processors are contributing factors for the spread of food borne outbreaks. Therefore, it has become a major public health concern. Hence, everyone in the food and agro-processing sector therefore needs information on food safety for preventing food borne diseases and death. This is in tandem with Omoare *et al.* (2022) who noted that food safety has become a crucial and growing public health problem in Nigeria. This is because illness resulting from consumption of infected food is one of the widespread health problems. Further, enlightenment on food borne infections and safety practices cannot

be over-emphasized with the alarming rate of outbreaks of food borne diseases.

In the same vain, Apanga *et al.* (2014) reported that in Africa, the incidence of food borne disease is estimated at an average of 3.3 to 4.1 episodes per child per year accounting for 450,000 to 700,000 deaths in children annually. Further, in Africa, cassava is the second most-consumed staple food crop after maize (Alamu *et al.*, 2019). As a result of the presence of hydrogen cyanide in fresh cassava tubers, it requires proper and safe processing. Poor processing of cassava results in health challenges. This is because poor food handling methods and contamination of food during processing and preservation are major sources of food-borne diseases. This is in line with the reports of Bolek (2020) and Flynn *et al.* (2019) that lack of proper

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food handling practices lead to food-borne diseases which cause a massive economic and social burden on societies and health systems.

From the foregoing, food poison is a serious concern, especially in developing countries where local food processors do not use modern facilities to process food and this in return may lead to food-borne diseases. Food-borne disease due to poor food processing contributes significantly to the huge burden of ill-health and death of people (Thomas and Philips, 2015; World Health Organization, 2015). Four hundred and twenty deaths are recorded globally as a result of food-borne illness (WHO, 2015). There is evidence of unsafe food practices among food producers, handlers in the food chain system, caterers, and processors. Therefore, food-borne illnesses may result from eating contaminated foods containing chemical or biological poisons and pathogenic microorganisms arising from careless or poor food handling practices at any stage in the food supply chain (Federal Ministry of Health, 2014).

Consequent upon this, it becomes imperative to encourage food safety practices of cassava processing, as these practices are necessary in all value addition stages to ensure the by-products are nutritious, safe, and wholesome for human consumption. Owing to the fact that food safety practices is a major concern especially with cassava, due to the presence of cyanide which is poisonous and can cause harm to humans when not properly processed, it becomes important to assess the food safety practices among the cassava processors in selected rural communities of Ogun State. Hence, this study specifically described the socio-economic characteristics of cassava processors in Ogun State, identified the processors sources of information on food safety practices, assessed the processors attitudes to food safety practices, identified the constraints to food safety practices, and assessed the level of food safety practices used. Also, significant relationship between the processors' source of information and processors' attitudes to food safety and the food safety practices used in the study area were tested.

Methodology: To achieve the objectives of this study, primary data were obtained with the aid of survey among cassava processors in selected rural communities of Ogun State in 2023. Ogun State is

located in the South-West geopolitical zone of Nigeria. The State is divided into four agricultural extension zones which are; Abeokuta, Ilaro, Ijebu, and Ikenne. Each of these zones are further divided into extension blocks and cells/circle respectively to enable ease of agricultural extension service provision. From the foregoing, multistage sampling procedure was adopted to select the sample for this study. In the first stage, two zones from the four agricultural extension zones in Ogun State were randomly selected. In the second stage, 50% of blocks in the selected zones were chosen randomly. In the third stage, 50% of cells/circles were selected from each of the chosen blocks, making a total of sixteen (16) cells/circles. Subsequently, the fourth stage involved selection of 20% of the total number (969) cassava processors resulting to one hundred and ninety-four (194) cassava processors that formed the sample size of the study.

Nineteen (19) cassava processing safety practices was generated and presented to the respondents. Responses were measured at 'Always', 'Occasionally', or 'Never'. Score of 2, 1, and 0 was assigned respectively. Mean score was used to calculate the level of practice into 'high' or 'low'. Above mean is high level of cassava food safety practices used, while below mean is low level of cassava food safety practices used. Descriptive statistics such as frequency, percentage, mean, and standard deviation were used to analyze the objectives, while Pearson Product Moment Correlation (PPMC) was used to test the hypotheses.

Results and Discussion: Socio-economic characteristics of the respondents: Results in Table 1 show that the average age of the cassava processors was 43 years. This shows that the processors are young, energetic and expected to be keen on embracing wholesome processing practices. This is in line with Oladejo (2017) who reported that the average age of cassava processors was 43 years. Further, majority (73.2%) of the cassava processors were females. This indicates that cassava and food processing as a whole is predominantly carried out by the women which is line with the a priori expectation. This finding supports the view of Henri-Ukoha *et al.* (2015) that women are more involved in the cassava production and processing. Subsequently, majority (79.4%) of the respondents

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are married which implies that processors will be willing to increase their income in order to cater for their family, improve their economic status and standard of living.

Furthermore, the mean household size was 5 persons. This implies that respondents have readily available family labour in addition to the hired labour, which is expected to enhance the use of safe and wholesome processing practices. This is similar to the finding of Okeowo (2015) who reported a household with about six household members are likely to enjoy readily available labour in cassava processing. Majority (97.4%) of the respondents had different forms of formal education. This could make the processors receptive to innovation and

stimulate their access to information on wholesome processing practices. This finding supports the conclusion of Thomas *et al.* (2015) who noted that educated farmers can convert information to knowledge which would impact on their knowledge level and ultimately the efficiency of their cassava processing operations. More so, the average processing experience was 18 years. The experience of the respondents in cassava processing is sufficient for a thorough understanding of food safety practices. Subsequently, majority (72.7%) of the cassava processor had access to extension agents and services. The implication of this is that cassava processors will maximize the information and knowledge impacted by the extension agent to their processing skills in other to enhance the business.

Table 1: Distribution of cassava processors by socio-economic characteristics (n=194)

Variables	Frequency	Percentage	Mean±SD
Sex			
Male	52	26.8	
Female	142	73.2	
Age			
21-30	18	9.3	
31-40	65	33.5	
41-50	74	38.1	43±8.43
51-60	37	19.1	
Marital status			
Single	18	9.3	
Married	154	79.4	
Divorced	15	7.7	
Widowed	7	3.6	
Religion			
Christianity	105	54.1	
Islam	84	43.3	
Traditional	5	2.6	
Household size (person)			
1-3	39	20.1	
4-6	99	51.0	5±2.09
7 and above	56	28.9	
Education			
No Formal Education	5	2.6	
Primary School	51	26.3	
Secondary School	118	60.8	
NCE	20	10.3	
Years of experience			
3-10	39	20.1	
11-18	71	36.6	18±7.83
19 and above	84	43.3	
Access to extension			

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No	53	27.3
Yes	141	72.7

Source: Field Survey, 2023.

Sources of information on food safety practices in cassava production: As shown in Table 2, cassava processors accessed information on food safety mainly through radio, fellow processors and their family. Radio (2.54) was recorded as the easiest means through which the cassava processors accessed information on food safety, followed by fellow processors (2.39), and family members (2.16), respectively. This shows that the processors had access to information on cassava processing

easily through radio, fellow cassava processors and family members. However, access to processing information through extension service was not encouraging. This suggests the need for the Women-in-Agriculture programme to be rejigged, so as to improve processors access to viable information and enhance their capacity through training. This is in accordance with Falola *et al.* (2022) that most of the cassava processor received information from their radio and fellow cassava processor.

Table 2: Distribution of respondents by sources of information about cassava food safety (n=194)

Variable	Never	Rarely	Occasionally	Always	Mean	Standard deviation	Rank
Radio	1.0	9.8	23.2	66.0	2.54	0.71	1 st
Fellow Processors	1.5	11.3	33.5	53.6	2.39	0.75	2 nd
Family members	1.5	19.1	41.2	38.1	2.16	0.78	3 rd
Sanitary officers	9.3	21.6	47.4	21.6	1.81	0.88	4 th
Extension Agents	26.3	5.7	36.1	32.0	1.74	1.17	5 th
Public space	11.3	32.5	43.3	12.9	1.58	0.86	6 th
Television	6.2	40.2	49.5	4.1	1.52	0.68	7 th
Newspaper	37.1	50.0	11.3	1.5	0.77	0.71	8 th

Source: Field Survey, 2023.

Attitude of processors towards cassava food safety practices: Using the mean score to rank the respondents' attitude towards cassava food safety, results in Table 3 reveal that the processors acknowledged, good processing hygiene can prevent food borne illness (4.39), environmental sanitation is an important part of their job responsibilities (4.34). In addition, the processors believed that they are willing to change their food processing behaviors when they know they are incorrect (4.32). This indicates that the processors attitude towards wholesome and safety processing practices is favourable. Consequently, it is suggestive of the fact that with a positive attitude as expressed by the processors, the use of food safety

practices in their processing operations will be prioritized if all constraints are addressed accordingly. Subsequently, result in Table 4 shows that, slightly over half (56.2%) of the processors had favourable attitude towards cassava food safety, while 43.8 percent of the processors were unfavourably disposed towards cassava food safety practices. It signifies that cassava processors are more likely to increase their level practices of food safety. This finding is in contrast with what was reported by Thomas *et al.* (2015) among cassava processors in Nigeria that processors had unfavourable attitudes towards cassava food safety practices.

Table 3: Distribution of respondents by attitudinal statements towards cassava food safety practices (n=194)

Attitudinal statements	SA	A	U	D	SD	Mean	Standard deviation	Rank
I believe that good processor hygiene can prevent food borne illness.	44.3	51.5	3.1	1.0	-	4.39	0.60	1 st

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I do not see environmental sanitation as an important part of my job responsibilities.	-	5.2	2.1	46.9	45.9	4.34	0.76	2 nd
I am willing to change my food processing behaviors when I know they are incorrect.	38.1	56.7	4.1	1.0	-	4.32	0.60	3 rd
I process anyhow I like because my customers do not demand thorough assurances about the safety of my products before they buy.	-	2.1	0.5	61.3	36.1	4.31	0.59	4 th
I believe that provision of appropriate, suitable, clean and protective clothing is necessary during processing	44.3	44.8	5.2	5.7	-	4.28	0.80	5 th
It is more important to have tasty food rather than safe food	-	0.5	4.1	73.2	22.2	4.17	0.51	6 th
I do not believe that covering of mouth and nose while sneezing or coughing during processing would affect the safety of the products	0.5	8.8	3.6	48.5	38.7	4.16	0.89	7 th
I am willing to attend a food safety training course.	35.6	43.8	8.8	9.8	2.1	4.01	1.01	8 th
I do not believe that obtaining more knowledge on cassava safety is a solution to food safety problems.	1.5	12.9	4.1	56.7	24.7	3.90	0.97	9 th
Safe processing practices are excessively burdensome.	0.5	21.1	11.9	51.5	14.9	3.59	1.00	10 th
I believe that the design and layout of my processing facilities has nothing to do with food safety practice	1.5	18.0	22.2	45.4	12.9	3.50	0.98	11 th
It is a big task for the food processors to ensure that food is safe to serve.	6.2	34.0	6.2	39.2	14.4	3.22	1.23	12 th

Source: Field Survey, 2023. SA (Strongly agree), A (Agree), U (Undecided), D (Disagree), SD (Strongly disagree)

Table 4: Distribution of respondents by attitudinal level towards cassava food safety (n=194)

Attitudinal Level	Frequency	Percentage	Mean	Standard Deviation
Unfavourable (below mean)	85	43.8	48.19	6.06
Favourable (mean and above)	109	56.2		

Source: Field Survey, 2023.

Constraints to cassava processors' food safety practices: Results in Table 5 show that inadequate finance to purchase modern equipment (1.79) was considered as the major constraint faced by processors. Others include the weak institutional

support services by extension workers or public officers (1.51), inadequate access to clean water (1.30) and non-availability of processing facilities (1.29). This implies that lack of access to these important amenities would impede the processors

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from practicing food safety practices in their processing activities. This finding is similar to Ewebiyi *et al.* (2020) who reported similar findings

and asserted that these constraints would threaten cassava farmers' ability to utilize improved processing technologies.

Table 5: Distribution of respondents by constraints to cassava food safety practices (n=194)

Constraints	Not severe	Mild	Severe	Mean	Standard Deviation	Rank
Inadequate finance for use to purchase modern equipment	1.5	18.0	80.4	1.79	0.45	1 st
Weak institutional support services by Extension workers or Public Officers	9.3	30.9	59.8	1.51	0.66	2 nd
Inadequate access to clean water	19.1	32.0	49.0	1.30	0.77	3 rd
Non-availability of processing facilities	19.6	31.4	49.0	1.29	0.78	4 th
Inability to meet demand volume	24.2	53.6	22.2	0.98	0.68	5 th
Cumbersome nature of the safety practices	30.4	54.1	15.5	0.85	0.66	6 th
Skilled labor not readily available	33.0	52.1	14.9	0.81	0.67	7 th
Poor access to public education and information	55.7	35.6	8.8	0.53	0.65	8 th
Inadequate training	58.2	31.4	10.3	0.52	0.68	9 th

Source: Field Survey, 2023.

Level of food safety practices used in cassava processing: Generally, result in Table 6 shows that over half (59.8%) of the processors had high level of food safety practices in cassava processing, while only 40.2 percent had low level of food safety practices used in cassava processing. This signifies that although the processors' level of wholesome practices in cassava processing is encouraging,

however, the possibility of decline is high if the constraints are not addressed, because there is marginal difference between those with high and low use of food safety practices during cassava processing. This finding is contrary to Falola *et al.* (2022) who posited that cassava processor had low level of safety practices in cassava processing in Nigeria.

Table 6: Distribution of respondents by Level of food safety practices (n=194)

Level of practice	Frequency	Percentage	Mean	Standard Deviation
Low (below mean)	78	40.2	29.81	3.48
High (mean and above)	116	59.8		

Source: Field Survey, 2023.

Relationship between processors' sources of information on food safety practices and level of food safety practices used: Results of correlation in Table 7 indicated a positive and significant relationship between sources of information and level of food safety practice ($r = 0.240$, at $p < 0.05$ level of significance). It can be inferred that access

to relevant information on food safety practices would promote compliance to the processors' level of practice in the study areas. A previous finding in a study conducted in Nigeria by Badaru *et al.* (2017) had shown that a significant relationship between the source of information and the level of food safety practices existed.

Table 7: Correlation analysis of level of food safety practices and sources of information on food safety

Variables	R	p value	Remark
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Sources of information on food safety practices	0.240**	0.001	Significant
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*Significant at $p \leq 0.05$

Relationship between processors’ attitude to food safety practices and the food safety practices used:

As shown in Table 8, there is a positive and significant relationship between processors’ attitude to food safety practices and level of food safety

practice ($r = 0.668$, at $p < 0.05$). This suggests that the more favourable the attitude of cassava processors towards food safety practices is, there will be increase in the level of safety practices used in the study area.

Table 8: Correlation analysis of level of food safety practices and processors’ attitude to food safety practices

Variables	r	p value	Remark
Cassava processors’ attitude to food safety practices	0.668**	0.000	Significant

*Significant at $p \leq 0.05$

Conclusion and recommendations: Conclusively, extension service was less prominent source of information among processors. In addition, lack of fund, inadequate extension support and lack of processing facilities were the major constraints faced by processors. Subsequently, slight majority of the cassava processors had favourable attitude towards cassava food safety. Over half of the respondents had high level of food safety practices in cassava processing. Further, there was a positive and significant relationship between sources of information; processors’ attitude to food safety practices and level of food safety practices. It is hereby recommended that extension unit with the mandate of serving women in agriculture should be enhanced to serve and train the processors accordingly so as to sustain and improve the food safety practices used and as well transform the attitude of the processors into a better food safety practice in the study area. Also, subsidized cassava processing equipment should be provided by the government to ensure quality and safe cassava product in the study area.

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