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Assessment of Information Needs of Cassava Processors on Food Safety Practices in Ogun and Oyo States, Nigeria

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Abstract
Cassava is a major staple crop that can be processed into diverse products for human consumption in Nigeria. However, improper practices and lack of knowledge of food safety practices by food processors are contributing factors for the spread of food borne outbreaks. Everyone in the food and agro-processing sector therefore needs information on food safety for preventing food borne diseases and death. Hence, this study was carried out to assess information needs of cassava processors on food safety practices in Ogun and Oyo States, Nigeria. Multistage sampling technique was used in the selection of 360 respondents for this study. Descriptive statistics, chi-square and Pearson Product Moment Correlation were used to analyze the data collected. Results of this study showed that the mean age of the respondents was 38.4 years, majority (79.7%) of the respondents was married, 41.9% had primary education; 35.8% of the respondents have spent more than 11 years in cassava processing. *Ohori* (62.3%) and *Arubieru* (37.7%) are the most processed varieties of cassava by the respondents; they processed 50 – 100kg/day using traditional equipment. Furthermore, many of the respondents did not have the knowledge that protective clothes such as apron, chef and cap should be worn during cassava processing (64.2%) and that blowing of nose and splitting during cassava processing cannot affect safety of food (67.5%). Meanwhile, most of the respondents need information on washing hands with soap and water before and after cassava processing (90.8%), and disposal of waste away from processing plant from time to time. Correlation results showed that there was a significant relationship between sources of information and food safety practices ($r = 0.79$, $p = 0.01$) at $p < 0.05$ level of significance.
Keywords: information needs, cassava processors, food safety practices,

1. Introduction

Cassava remains a major staple food in Sub-Saharan African countries (SSA) which include Nigeria. However, poor and unhygienic handling of the crop often lead to food borne diseases and in many cases death, especially in the rural areas where there is no access to food safety information. The common food processing practice in the rural areas is unwholesome. For instance, cassava flour (*laafun*) are usually spread beside the major roads for sun drying in such a way that vehicular dusts, droppings from birds, rodents and insects are deposited on the product leading to food borne diseases. Diseases arising from food consumption have become serious public health problem globally (Zeru *et al*., 2007; WHO, 2004). In developing countries, up to an estimated 70% of cases of diarrhoea disease are associated with consumption of unwholesome food (Zeru *et al*., 2007; Mukhopadhyay *et al*., 2012; Annor *et al*., 2011). 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 (Apanga *et al.*, 2014). Food contamination can occur at any point during its preparation, bringing to bear the importance of food safety and hygiene in the prevention of food borne diseases (Green *et al*., 2005; Mudey *et al*., 2010; Ismail *et al*., 2013). Inadequate knowledge of food borne diseases and improper handling of food among others has been reported as some of the causes of food borne illness (Oladoyinbo *et al.*, 2015). Provision of unsafe food can also be attributed to inadequate food safety laws, weak regulatory systems, lack of financial resources to invest in safer equipment. Unsafe food containing harmful microorganisms virus, parasites or chemical substances causes more than 200 diseases, ranging from diarrhoea, cholera, vomiting, fever to cancer and meningitis (WHO, 2015b). Others problems associated with unsafe food include kidney and liver failure, brain and neural disorders, reactive athirst and death. It could also affect reproductive health and immune systems (WHO, 2013). Food borne diseases not only adversely affect people's health and well-being, but also have negative economic consequences for individuals, families, communities and countries. These diseases impose a substantial burden on health-care systems, trade and tourism. The diseases also impede socio-economic development, reduce economic productivity, harming national economies and threaten livelihood. The WHO (2014) estimates that more than 200,000 people die of food poisoning annually in Nigeria which is caused by contaminated foods through improper food processing, preservation, storage and food preparation. WHO (2015) estimated up to 1.5 billion episodes of diarrhoea and more than 3 million deaths occur in children every year as a result of food contamination. The people who are mostly affected are children, the poor and the rural dwellers. The Guardian Newspaper of 29th Jan., 2016 gave the statistics of the number of Lassa fever infection in West Africa each year as between 100,000 to 3000,000

with about 5,000 deaths. Everyone in the food and agro-processing sector including consumer needs information on food safety for preventing food borne diseases and death. So, information need could be view as a mean to an end and not an end in itself. The knowledge of food handlers about the food borne infections and their safety practices is an important issue in the outbreaks of food borne infection (Fowora, 2012). It is therefore important for cassava processors to be well equipped with food safety practices (FSP) information so that they can perform at optimal capacity and provide safe food for public consumption which could help prevent food borne diseases and save many lives. Tologbonse *et al*. (2008) stated that one of the fundamental needs for farmers to yield good output is information. It is against this background that this research work is design to assess the information needs of cassava processors on Food Safety Practices (FSP) in Ogun and Oyo States, Nigeria.

1.2 Objectives of the study

The general objective of the study is to assess the information needs of cassava processors on food safety practices in Ogun and Oyo States, Nigeria. The specific objectives are to:

i. describe the socio-economic characteristics of cassava processors in the study areas,
ii. identify the processors sources of information on food safety practices in the study areas,
iii. examine food safety practices of the cassava processors in the study areas,
iv. identify the information needs of the cassava processors on food safety practices in the study areas,
v. identify the constraints faced by cassava processors in employing food safety practices,

1.3 Hypotheses of the study

H_{01}: There is no significant relationship between socio-economic characteristics of cassava processors and food safety practices used

H_{02}: There is no significant relationship between processors' sources of information on food safety practices and food safety practices used

2.0 Research Methodology

This study was carried out in Ogun and Oyo States Nigeria.

2.1 Profile of Ogun State

Ogun State is one of the six States in the south west Nigeria. The state was created in February 3rd, 1976. It is bounded in the west by Republic of Benin, bounded in the south by Lagos State and Atlantic Ocean, in the North by both Oyo and Osun States and in the East by Ondo State. The State lies between the latitudes $7^0$18'N and longitude $5^0$55'E. It is situated within the tropics covering 16,409.29km^2 with a population of about 4,054,272 (National Population Commission (NPC), 2006). Ogun State is heterogeneous state, inhabited predominantly by the Egba, Yewa, Ijebu, Remo, Awori and Egun who belong to the Yoruba ethnic group on the Africa Continents. The population of males in Ogun State is 1,847,243 while the population of female is 1,880,855 according to Nigeria Population Census final population release (Federal Republic of Nigeria, 2009). The state is approximately covering 1.9 percent (i.e. 16,762km^2) of Nigeria 923,219km^2 land areas. The State has bimodal rainfall pattern which reaches its peak in July and September and it comprises of mostly agrarian communities which engages the farming activities of both males and females, in cash crops and food crops in order to meet the livelihood needs of the farmer, in addition to their foreign exchange. Most of the crops grown in Ogun State include cassava, rice, maize, melon, cotton, cocoyam, cocoa, yam, cowpea etc. The emphasis of traditional Agriculture in Ogun State is more on crops, while the livestock raised is supplementary. Cultivation and processing of cassava is popular in the rural farming system of Ogun State.

2.2 Profile of Oyo State

Oyo State is an inland state in south-western Nigeria, with its capital at Ibadan. It is bounded in the north by Kwara State, in the east by Osun State, in the south by Ogun State and in the west partly by Ogun State and partly by the Republic of Benin. Oyo State covers approximately an area of 28,454 square kilometers and is ranked 14th by size. The climate is equatorial, notably with dry and wet seasons with relatively high humidity. The dry season lasts from November to March while the wet seasons starts from April and ends in October. Average daily temperature ranges between 25^0C (77.0^0F) and 35^0C (95.0^0F), almost throughout the year. According to Nigerian Information and Guide (2015), it was formed in 1976 from Western State, and it was split into Oyo and Osun States in 1991. Oyo State is homogenous, mainly inhabited by the Yoruba ethnic group who are primarily agrarian but have a predilection for living in high-density urban centers. The indigenes mainly comprise the Oyos, the Oke-Oguns, the Ibadans and the Ibarapas, all belonging to the Yoruba family and indigenous city in Africa, south of the Sahara. Other notable cities and towns in Oyo State include Oyo, Ogbomoso, Iseyin, Kishi, Okeho, Saki, Eruwa, Igboho, Lanlate, Oje-Owode, Sepeteri, Ilora, Awe, Igbeti, Igboho and Igbo-Ora, Out. Oyo State has thirty-three (33) local government areas (Oyo State Government, 2016). Agriculture is the main occupation of the people of Oyo State.

The climate in the state favours the cultivation of crops like maize, yam, cassava, millet, rice, plantains, cocoa, palm produce, cashew, etc. There are a number of government farm settlements in Ipapo, Ilora, Eruwa, Ogbomosho, Iresaadu, Ijaiye, Akufo and Lalupon (Oyo State Government, 2016).

2.3 Sampling technique and sample size

Multistage Sampling technique was used to select the respondents. The first stage involved purposive selection of two Local Government Areas each from Ogun and Oyo States where cassava processing is very predominant. The two LGAs from Ogun State are Yewa North and Ijebu-Ode while Afijio and Atiba were selected from Oyo State. The second stage involved the selection of 3 communities each from the 4 selected Local Government Areas in the 2 States, this gave rise to 12 communities namely; Igbogila, Imasayi, Eegua, Idomowo, Ayegun, Molepa, Saabo-Ilora, Fiditi, Jobele, Isale-Oyo, Ajegunle, and Kosobo. Snow ball sampling technique was used to select 30 cassava processors in each of the twelve selected communities in Ogun and Oyo States. This gave a total of 360 cassava processors as the sample size for this study.

2.4 Data Collection, Validity of the instrument and measurement of variables

Data for this study were collected through the use of a well-structured interview guide. The instrument used for data collection was subjected to face validity involving assessment by experts in Home Science Economics, Food Science Technology, Agricultural Extension and Rural Development, their criticisms and suggestions were positively utilized for a more valid instrument. Age of the respondents, household size, years of experience in cassava processing and income per month were measured at ratio level while sex, marital status, educational attainment and ethnicity were nominally measured. Sources of information were measured as follows on 4-point rating scale as: Always (3), occasionally (2), Seldom (1) and Never (0). The scores of each respondent were pooled and mean computed. Information needs were nominally measured.

A 4-point rating scale of: never (0), rarely (1), sometimes (2) and always (3) was used to measure food safety practices of the respondents. The mean score was calculated and used to categorize respondents into high compliance and low compliance. The minimum score is 0, and the maximum score is 54. A 3-point rating scale of: not severe constraint (0), severe constraint (1), and very severe constraint (2) was used to measure constraints. Data obtained from this study were analyzed with frequency counts percentage, means, standards deviation, chi-square and Pearson Product Moment Correlation (PPMC).

3.0 RESULTS AND DISCUSSION

3.1 Socio-economic characteristics of the respondents

Results in Table 1 showed that the mean age of the respondents was 38.4 years; 46.7% of the respondents were between 36 – 40 years of age, and 23.1% were above 41 years. This shows that the respondents are still within economically active age bracket of 30 – 40 years. Oladoja *et al*. (2006), Ibitoye *et al*. (2013), Omoare *et al*. (2015) and Oyediran *et al*. (2016) have made similar findings in their studies that most Nigerian farmers are within this age group and are the economically active part of the population. Age has been reported to be an important variable since it has influence on people's skills and aspiration. The result further showed that majority (79.7%) of the respondents was married. But, 6.9% were single while 13.3% were separated. Ebewore *et al*. (2013) reported that marital status is a crucial factor in shaping social rural participation and acceptance. Omoare *et al*. (2015) and Oyediran e*t al*. (2017) also reported in their findings that majority of rural households in Nigeria are married and this has conferred some level of responsibilities and commitments on individual who are involved. Many (41.9%) of the respondents had primary education and 31.7% had secondary education. Meanwhile 26.4% did not have formal education. This implies that majority of the respondents have formal education up to secondary education before venturing into cassava processing as a means of livelihood. The result revealed that the household size of majority (64.2%) of the respondents was less than 4 people while 35.8% had 5 – 9 people. The mean household size was 4 people. These findings indicate that the household size of respondents was relatively small. Ebewore *et al*. (2013) opined that household size is an important index in any rural development intervention which can affect the outcome of such intervention. Most (67.8%) of the respondents were Yoruba tribe while 25.3% were *Egede* tribe and 6.9% were *Ohori* tribe. The dominance of Yoruba in the study areas is because the study was conducted in southwest, Nigeria which is home of Yoruba tribe. These results revealed that 35.8% of the respondents have spent more than 11 years in cassava processing, 32.5% have spent 6 - 10 years while 31.7% spent less than 5 years. The average year put into cassava processing was 10.2 years. This has revealed that respondents are not new in cassava processing in the study areas. More than half (55.3%) of the respondents were member of cassava processing association, 44.3% were not member; 64.2% had less than 5 years of membership, 12.8% had 6 – 10 years and 23.1% had more than 11 years. This is in tandem with Oladele and Afolayan, (2005) who indicated that high levels of social participation and linkages can give rise to high level of innovation dissemination, mass adoption and increased productivity due to group dynamism. Many (41.7%) of the respondents hired 5 – 7 workers to assist in cassava processing, 26.1% had less than 4 workers while 32.2% had more than workers. The average

number of workers is 7 people. This is an indication that cassava processing operations are not done alone by the cassava processors, that is, more hands are employed in processing activities.

Table 1: Distribution based on socio-economic characteristics of the respondents (n = 360)

Variables	Frequency	Percentages	Mean	Std. Dev.
Age (years)				
25 – 30	63	17.5		
31 – 35	46	12.8		
36 – 40	168	46.7	38.4	5.7
41 and above	83	23.1		
Marital status				
Single	25	6.9		
Married	287	79.7		
Separated	48	13.3		
Educational attainment				
No formal education	95	26.4		
Primary education	151	41.9		
Secondary education	114	31.7		
Household size (people)				
Less or equal to 4	231	64.2	4	1
5 – 9	129	35.8		
Ethnicity				
Yoruba	244	67.8		
Egede	91	25.3		
Ohori	25	6.9		
Years of experience				
Less than or equal 5	114	31.7		
6 – 10	117	32.5	10.2	4.1
11 and above	129	35.8		
Cassava association				
Member	199	55.3		
Not a member	161	44.7		
Years of membership				
Less than or equal 5	231	64.2	4.7	5.6
6 – 10	46	12.8		
11 and above	83	23.1		
Number of workers (people)				
Less than or equal 4	94	26.1		
5 – 7	150	41.7	7	2
8 and above	116	32.2		

Source: Field survey, 2017

3.2 Enterprise Characteristics

Result in Table 2 showed that the common cassava varieties processed by the respondents in their local names are *Ohori* (62.3%) and *Arubieru* (37.7%). Majority (76.1%) of the respondents processed 50 – 100kg/day while 23.9% processed more than 100kg/day. Traditional equipment was predominantly used in cassava processing operations in the study area. Raw materials are usually purchased from farm/market within the community or near/by (73.6%) and far distance/other village/town (26.4%). Most (89.7%) of the respondents did not engaged in other occupation while 10.3% have other occupation apart from cassava processing. The average estimated income was ₦29,347.50/month with 26.7% generated ₦15,000 – 20,000/month and 42.2% generated more than ₦31,000/month.

Table 2: Distribution based on enterprise characteristics (n = 360)

Variables	Frequency	Percentages	Mean
Variety			
Arubieru	136	37.7	
Ohori	224	62.3	
Production output			
50 – 100	274	76.1	101.2
101 and above	86	23.9	
Equipment			
Traditional	360	100	
Raw materials			
Purchased from farm/market within the community or near/by	265	73.6	
Purchase from far distance/other village/town	95	26.4	
Other occupation			
No other occupation	323	89.7	
Involved in other occupation	37	10.3	
Income/month (₦)			
15,000 – 20,000	96	26.7	
21,000 – 25,000	49	13.6	
26,000 – 30,000	63	17.5	29,347.50
31,000 and above	152	42.2	

Source: Field survey, 2017

3.3 Sources of information on food safety practices

Majority of the respondents always got information through their friends, family and relations (73.6%) and fellow cassava processors (58.6%). Information through community health workers (67.8%) and extension agents (35.8%) were rarely available to the respondents. Also, respondents did not have access to information through radio and television (90%), church/mosque (90.3%) and posters/handbill (100%). This shows that information on cassava processing was getting to the women through friends and fellow cassava processors. These results conform to the findings of Omoare *et al*. (2015) and Oyediran *et al*. (2017) that farmers' associations and friends have been the dominant sources of information in the rural areas of Nigeria.

Table 3: Distribution based on sources of information on food safety practices (n = 360)

Sources	Always	Occasionally	Rarely	Never
Friends, family and relations	265 (73.6)	82 (22.7)	13(3.6)	0(0.0)
Fellow cassava processors	211(58.6)	149(41.4)	0(0.0)	0(0.0)
Community health workers	0(0.0)	0(0.0)	244(67.8)	116(32.2)
Extension agents	0(0.0)	01(0.3)	129(35.8)	230(63.9)
Radio and Television	0(0.0)	01(0.3)	35(9.7)	324(90.0)
Church/mosque	0(0.0)	0(0.0)	35(9.7)	325(90.3)
Posters/handbill/banners and bill board	0(0.0)	0(0.0)	0(0.0)	360(100)

Source: Field survey, 2017

3.4 Information needs of cassava processors

Most of the respondents indicated that they need information on washing hands with soap and water before and after cassava processing (90.8%), disposal of waste away from processing plant from time to time (58.6%), carrying out cassava processing in clean and contaminants free environment (41.7%) and drying of cassava on a clean concrete slab (67.8%). This is necessary to improve the quality of cassava products being produced in the study areas. Contrary to that, 92.5% indicated that they did not need information on the use safe/potable water for processing. This means that the respondents already knew that it is very important and hygienic to wash cassava with clean portable water despite the fact that clean water is not available in the study areas. Information is also needed to inform the respondents that sick people with infectious diseases should not be allowed to come in contact with processed cassava products (89.7%); that they should always use protective clothes/attire such apron, cap, nose-guard during cassava processing (89.4%); discourage eating, drinking and smoking in processing area (93.9%), and keep away your pets and other domestic animals from your cassava processing site (89.7%). These are vital areas which should be the focus of trainers on food safety measures in the study areas and nation at large.

Table 4: Distribution based on information needs of cassava processors (n = 360)

Information needs	Yes	No
Always wash hands with soap and water before and after cassava processing	327(90.8)	33(9.2)
Dispose waste away from processing plant from time to time	211(58.6)	149(41.4)
Do cassava processing in clean and contaminants free environment	150(41.7)	210(58.3)
Drying of cassava must be done on a clean concrete slab	244(67.8)	116(32.2)
Do you use safe/potable water for processing?	27(7.5)	333(92.5)
Don't allow sick people with infectious diseases to come in contact with processed cassava products	323(89.7)	37(10.3)
Always use protective clothes/attire such apron, cap, nose-guard during cassava processing	322(89.4)	38(10.6)
Do not encourage eating, drinking and smoking in processing area?	338(93.9)	22(6.1)
Wash your cassava tuber properly after peeling to remove sand and dirt	36(10.0)	324(90.0)
Keep away your pets and other domestic animals from your cassava processing site	323(89.7)	37(10.3)

Source: Field survey, 2017

3.5 Food safety practices used by the respondents

Results in Table 5 showed that majority of the respondents rarely practiced hand washing with soap and clean water before and after cassava processing ($\bar{X}$ = 3.03), and after using toilet or blowing nose during cassava processing ($\bar{X}$ = 3.35). These findings against the recommendations of WHO (2013) that food processors should engage in proper hand washing practices; it is one of the most effective ways to prevent bacterial and viral contamination and to even save lives. Centers for Disease Control and Prevention (CDC) (2011) also argued that proper hand washing with clean running water (hot enough to tolerate) and soap for the food handlers. Similarly, most of the respondents rarely carried out processing of cassava when sick or allowing sick person to involve in food processing ($\bar{X}$ = 1.07), processing cassava when having exposed deep cut/open wound on your hands ($\bar{X}$ = 1.05), and use of apron and nose-guard while processing cassava ($\bar{X}$ = 1.04). Abass *et al.* (2014) have reiterated that workers with open sores, infected wounds or serious illnesses (vomiting, diarrhea) should not be allowed in the processing room. Respondents however exercised the covering of hair during cassava processing ($\bar{X}$ = 2.52), cleaning and disinfecting tools and equipment before and after cassava processing operations ($\bar{X}$ = 3.51), prompt disposal of waste and sewage away from processing site ($\bar{X}$ = 3.58) and cassava processing environment is dust-free and also free of contaminants ($\bar{X}$ = 2.63). These practices agreed to the position of Taiwo and Fasoyiro (2015) on the cleanliness of food processing equipment, food handlers and environment. Also, cassava processors in the study areas did not have valid certificate of medical fitness ($\bar{X}$ = 1.29), not avoiding much talking and splitting during cassava processing operations ($\bar{X}$ = 1.29) and never used clean and potable water in cassava processing operations ($\bar{X}$ = 1.61). This means that food safety practices of the respondents was very poor and it can cause food borne diseases to the final consumers. All the respondents always ensured that raw and processed cassava products are not kept on bear floor ($\bar{X}$ = 2.69), eating, drinking and smoking are prohibited in cassava processing areas ($\bar{X}$ = 3.29) and drying of product is not done on bare floor and road sides ($\bar{X}$ = 3.49). Respondents' actions concurred with IITA (2010) and FMH (2014) which maintained that smoking, coffee and all forms of eating or drinking should not be allowed in the production and packing areas to avoid contamination and spread of diseases and human death. Majority of the respondents did not store processed products at appropriate temperature and humidity ($\bar{X}$ = 1.08) and allowed house pets such as dog, cat, birds, etc. in cassava processing areas ($\bar{X}$ = 1.15). The implication is that processed product can easily get spoiled and animal droppings can infect the cassava with food borne diseases if not well prepared for consumption.

Table 5: Distribution based on food safety practices used by the respondents (n = 360)

Food safety practices used by the respondents	Mean	S.D.
Washing your hands before and after cassava processing	3.03	1.40
Washing your hands after visiting toilet, sneezing or the hand touches any part of the body	3.35	0.94
Processing cassava when you are sick or allowing sick person to involve in food processing	1.07	0.94
Processing cassava when you have exposed deep cut/open wound on your hands	1.05	0.26
Use of apron and nose-guard while processing cassava	1.04	0.25
Covering of hair during cassava processing	2.52	0.88
Cleaning and disinfecting tools and equipment before and after cassava processing operations	3.51	0.91
Cassava processors in this location have valid certificate of medical fitness	1.29	0.89
Prompt disposal of waste and sewage away from processing site	3.58	0.91
Cassava processing environment is dust-free and also free of contaminants	2.63	1.41
Avoid much talking and splitting during cassava processing operations	1.29	0.89
Only clean and potable water is used in cassava processing operations	1.61	1.05
Raw and processed cassava products are not kept on bear floor	2.69	1.35
Eating, drinking and smoking are prohibited in cassava processing areas	3.29	0.77
Processed products are stored at appropriate temperature and humidity	1.08	0.36
House pets such as dog, cat, birds, etc are not allowed in cassava processing areas	1.15	0.57
Drying of product is not done on bare floor and road sides	3.49	0.52

Source: Field survey, 2017

3.6 Constraints militating against the use of appropriate food safety practices

There are many constraints identified as impediment to information need and food safety practices of cassava processors in the study area. Majority of the respondents indicated that ineffective extension agents (98.9%), food safety regulatory agencies (98.1%) and inadequate processing and storage facilities (97.8%) were the most serious constraints and were ranked 1st, 2nd and 3rd respectively. Bad road or in-accessibility of rural areas and poor transportation systems (97.2%), proximity of processing units to refuse dump sites (96.9%), erratic nature of electricity supply (96.1%), and non-availability of toilet facilities in the processing plant vicinity (94.2%) were also major impediments to food safety practices. Thomas and Philips (2015) reported similar findings in their study conducted among cassava processors in rural communities of Oyo State, Nigeria. Other major constraints identified were inadequate funding of safety programmes (87.5%), non-availability of training or workshop on food safety practices (86.9%) and Lack of credit facilities to cassava processors (67.8%).

Table 6: Distribution based on constraints (n = 360)

Constraints	Yes	No	Rank
Non availability of potable water	204(56.7)	156(43.3)	11th
Erratic nature of electricity supply	346(96.1)	14(3.9)	6th
Bad road or in-accessibility of rural areas and poor transportation systems	350(97.2)	10(2.8)	4th
Ineffective extension agents	356(98.9)	4(1.1)	1st
Inadequate processing and storage facilities	352(97.8)	12(2.3)	3rd
Inadequate funding of safety programmes	315(87.5)	45(12.5)	8th
Lack of credit facilities to cassava processors	244(67.8)	116(32.2)	10th
Non-availability of training or workshop on food safety practices	313(86.9)	47(13.1)	9th
Ineffective food safety regulatory agencies	353(98.1)	7(1.9)	2nd
Proximity of processing units to refuse dump sites	349(96.9)	11(3.1)	5th
Non-availability of toilet facilities in the processing plant vicinity	339(94.2)	21(5.8)	7th

Source: Field survey, 2017

3.7 Hypotheses testing

3.7.1 Relationship between selected socio-economic characteristics of the respondents and food safety practices

The results of chi-square analysis in Table 7 revealed that age ($\chi^2 = 19.70$, df = 3, p = 0.00), educational status ($\chi^2 = 13.10$, df = 3, p = 0.02), household size ($\chi^2 = 21.39$, df = 2, p = 0.01) and income ($\chi^2 = 14.72$, df = 3, p = 0.03) were significant to the food safety practices at $p < 0.05$ level of significance. The implication is that age, educational status, household size and income significantly influence the food safety practices. It can be said that younger women that are educated and have higher income are more likely to ensure food safety practices compare to the older women without formal education and lesser income. It means that socio-economic variables determine food safety practices of the cassava processors. The result supports Thomas and Philips (2015) findings among cassava processors in Oke-Ogun of Oyo State, Nigeria. Therefore, the null hypothesis that *"there is no significant*

relationship between socio-economic characteristics of the respondents and food safety practices" is rejected.

Table 7: Relationship between socio-economic characteristics of the respondents and food safety practices

Variables	χ^2	df	p-value	Significant
Age	19.70	3	0.00	S
Educational status	13.10	3	0.02	S
Household size	21.39	2	0.01	S
Income	14.72	3	0.03	S

Source: Field survey, 2017
S - Significant at $p < 0.05$ level of significance
df – degree of freedom

3.7.2 Relationship between sources of information and food safety practices

Results of correlation in Table 8 indicated a positive and significant relationship between sources of information and food safety practice ($r = 0.79$, $p = 0.01$) at $p < 0.05$ level of significance. It can be inferred that access to relevant information on cassava processing would promote compliance to food safety practices by the cassava processors in the study areas. It means that for every 1% increment in access to relevant information would lead to 79% compliance to food safety practices. A previous finding in a study conducted in rural areas of Ogun State, Nigeria by Omoare *et al*. (2015) had shown that a significant association existed between sources of information and gender involvement in cottage industries. Hence, the null hypothesis that "*there is no significant relationship between sources of information and food safety practices*" is rejected.

Table 8: Relationship between sources of information and food safety practices

Variables	r	p-value	Significant
Sources of information	0.79	0.01	S

Source: Field survey, 2017
S - Significant at $p < 0.05$ level of significance

5. Conclusion

This study established that most of the respondents are within economic active age; married; many did not have formal education; *Ohori* and *Arubieru* are the common varieties of cassava processed by the respondents; they processed 50 – 100kg/day using traditional equipment. The average monthly income realized was ₦29,347.50 from cassava processing. Friends, family and relations and fellow cassava processors were the most effective sources of information on cassava processing in the study areas. Contrarily, community health workers and extension agents have not been effective in reaching respondents on food safety practices in the study areas. Most of the respondents need information on washing hands with soap and water before and after cassava processing, disposal of waste away from processing plant from time to time, carrying out cassava processing in clean and contaminants free environment and drying of cassava on a clean concrete slab. Majority of the respondents rarely practiced hand washing with soap and clean water before and after cassava processing, and after using toilet or blowing nose during cassava processing. Cassava processors in the study areas did not have valid certificate of medical fitness, and never used clean and potable water in cassava processing operations. Food safety practices of the respondents was poor and against food safety recommendations of World Health Organization. From this conclusion the study recommends that subsidized cassava processing equipment should be provided by the government to ensure quality and safe cassava product in the study areas; Cassava processors should be continuously trained on food safety practices by the community health workers, sanitation officers and rural extension agents to improve the food safety knowledge and as well transform the attitude of the respondents into a better food safety practices in the study areas; and Cassava processors should be encouraged to register their organizations with NAFDAC and other relevant bodies. This will go a long way in enhancing food quality and standardization in both local and foreign trade.

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