

Perception of homemakers towards the processing and utilization of plantain products for food security in delta state, Nigeria

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ARTICLE INFO	Abstract
<p>Keywords: <i>Food Security, Homemakers, Plantain Products, Processing, Utilization.</i></p> <p>©2026 Author(s): This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International</p> 	<p><i>The study examined homemakers' capacity building needs in processing and utilization of plantain products for food security in Delta State. Two research questions and hypotheses were respectively raised to guide the study. The population of the study consisted of 236,315 female homemakers who deal with the plantain products in Delta State. The study utilized a descriptive survey research design that employed questionnaire in collecting respondents' opinions on the problem under investigated. The instrument was face validated by three experts; and the reliability was established using the test-retest reliability method which gave a correlation co-efficient of 0.80, showing that the instrument is reliable. Data were analyzed with Mean (\bar{x}) and standard deviation (SD) for the research questions, while t-test was used to test the hypotheses at 0.05 alpha level. The study revealed that homemakers have positive perception regarding the processing and utilization of plantain products and by extension there was a significant difference between the mean (\bar{x}) responses of rural and urban homemakers on their perceptions regarding how plantain products processing and utilization can boost food security in Delta State. The second finding revealed that there was a significant difference between the mean (\bar{x}) response of the required skills possessed by young and old homemakers in processing and utilization of plantain products to achieve food security. Based on the findings, it was recommended that Homemakers should be sensitized on how plantain products can be utilized to boost household food security in Delta State, among others.</i></p>

Introduction

In the hierarchy of necessities, food comes first because it is necessary for a healthy existence. In many developing nations, like Nigeria, where a sizable section of the populace struggles with hunger and malnutrition, food security is a crucial concern. For Delta State, Nigeria, to maintain food security, reliance on staple crops like plantains (*Musa paradisiaca*) has grown in significance (Udomkun et al., 2021). Thus, achieving food security is crucial for any nation. When everyone, everywhere, has physical, social, and financial access to enough safe, nourishing food to suit their dietary needs and food preferences for an active and healthy life, then there is food security (Food and Agriculture Organisation of the United Nations, as cited by Anugwa & Agwu, 2016).

Food security, as described by Almadini (2024), is the regular supply of food to guarantee a healthy existence for every person. The issue of food availability in this context assesses the ease with which households may obtain food, with a primary focus on crop productivity and livestock ownership. Food availability is a notion that falls under the "supply side" of food security and is impacted by various factors, including net trade, stock levels, and the amount of food produced. Food access, or having access to enough food, is another notion that is closely connected. The four primary components of food security are availability, access, utilisation, and stability, according to Anugwa and Agwu (2016). When food is available at the household level, it indicates that there is enough food which is either from their own production, local production, food assistance, or market purchases that is safe and nourishing. Food must always be available to homes with the financial means to buy high-quality food, and food utilisation requires household understanding of basic nutrition concepts as well as methods for storing, preparing, and utilising food (Anugwa & Agwu, 2016).

According to Rajkishor (2007), food security is the year-round availability and accessibility of safe, nutrient-dense food that satisfies the dietary needs of every household member and guarantees appropriate nutrient intake. According to Eme et al. (2014), food security is a complex problem that includes both having access to enough food and receiving the kind of nutrition that is required for good health. Reaching food security goals is challenging since there are many variables that affect how well-nourished a household is. Rising food costs for staples like rice and yams are a result of Nigeria's economic woes, which have been made worse by issues like the Boko Haram insurgency and unrest in the Niger Delta (National Bureau of Statistics, 2014). Nigeria has abundant natural and human resources, yet these problems impede food security. One essential source of carbohydrates is plantains, with Nigeria being the largest producer in West Africa (Ibrahim, 2013).

Plantain is a highly perishable fruit because it has a very short shelf life. Thus, it is usually processed into durable products like chips and flour (Ibrahim, 2013). Plantain can either be used for domestic consumption or used as input by other producers. Plantain flour apart from being used as a substitute for cassava flour, especially for diabetic patients, also serves as a raw material used in the production of cakes, chips, puff-puff, and biscuit. Plantain (*Musa paradisiaca*) is a staple food for over three million households in West and Central Africa. Nigeria is the world's top plantain producer (Lescot, 2020). Plantain ranks third in production among starchy staples after cassava and yam. Plantains are mainly cultivated by smallholders for their starchy fruits which serve as a source of calories and can be processed for consumption across different stages of ripeness.

Plantains are processed using a range of methods, including boiling, roasting, deep-frying, and pounding, to create culinary products including chips, flour, and biscuits (Ekesa et al., 2012). In Nigeria and other parts of West Africa, boiling, frying, and drying are common preparation methods; product names differ according on the region. According to a study by Ngoh et al. (2021), Cameroonian women's preferences for plantain products vary across urban and rural contexts, shaped by attributes such as size, firmness, and flavour. Rural women tend to rely on traditional preparation methods, while urban women prefer processed forms like fried or boiled plantains. These differences reflect broader socio-cultural and economic dynamics influencing food choices and practices. Such variations align with wider discussions on social behaviour, historical interactions, and development patterns in African societies (Chukwu et al., 2025; Molokwu et al., 2023; Muogbo et al., 2025a; Muogbo et al., 2025b; Ezeogidi et al., 2020), highlighting how context shapes everyday consumption and production decisions.

A homemaker is defined as a family member, often a woman, responsible for caring for the family and managing their menu. To ensure a quality lifestyle, homemakers must derive satisfaction from the goods and services they choose, which can lead to long-term financial savings (FAO, 2015). They play a crucial role in food decision-making, and their perceptions of food products, such as plantain, significantly impact dietary choices. Understanding these perceptions is essential for promoting food security. Udomkun et al. (2021) note that factors like cultural beliefs, socioeconomic

status, and education shape consumer preferences. In relation to plantain, homemakers may have specific views on its nutritional value, taste, and convenience, which can influence their willingness to incorporate processed plantain into their diets and affect their food preparation practices. Addressing these perceptions can help develop effective strategies to enhance food security through better utilization of plantain products.

Homemakers require specialized knowledge in plantain ripeness, processing methods, and preparing wholesome meals in order to process and use plantain goods efficiently. To guarantee the safety of processed goods, food safety training is also necessary. Gaining these abilities optimises plantains' potential as a source of food security (Ayinde et al., 2017). Plantain processing training programs has the potential to empower homemakers, increase their self-assurance in food preparation, and improve household food security, irrespective of their marital status or place of residence.

Plantains are a mainstay in Delta State, where food security depends on the processing and use of plantain products. Women in urban and rural areas perceive things differently, which is influenced by cultural, environmental, and socioeconomic variables. Urban women have greater access to contemporary processing tools, which enables them to produce goods with additional value like flour and plantain chips, potentially increasing their earnings (Udomkun et al., 2021). To develop their abilities, they also obtain instruction and other information. However, the conventional ways that rural women employ limit the range of products and food security. While homemakers in rural areas follow customs and concentrate on subsistence, those in urban areas place more importance on marketability and nutritional value. This disparity draws attention to the different methods used to process plantains and how those methods affect food security (Udomkun et al., 2021; Kouamé et al., 2015).

Traditional food handling and preparation practices represent valuable indigenous knowledge, passed down through generations (Kuyu & Bereka, 2019). Older married women generally possess greater skills and knowledge in processing plantain products, relying on cultural practices and traditional recipes. Their processing methods, such as boiling and frying, emphasize heritage and time-tested techniques. In contrast, younger homemakers, influenced by education and modern technologies, often prioritize innovative processing techniques that enhance nutritional value and marketability. They may experiment with contemporary recipes and methods like dehydration or frying to create snacks (Udomkun et al., 2021). Thus, perceptions of the necessary skills for plantain processing vary significantly between old and young generations, shaped by factors like access to resources and cultural influences (Kuyu & Bereka, 2019).

Statement of the Problem

Plantains have the potential to improve Delta State's food security, but there are major obstacles to their efficient processing and use. One major problem is that homemakers, especially the younger ones, don't know enough about the nutritional value of plantains and how they're processed. This frequently leads to underuse of this essential dietary source. Furthermore, a lot of stay-at-home moms lack the abilities needed for efficient processing, which results in subpar food preparation methods that don't maximise nutritious content. They also find it difficult to implement cutting-edge techniques that might raise the calibre and security of plantain products in the absence of the necessary resources and skills.

Homemakers' opinions of plantain processing are greatly influenced by cultural values and socioeconomic circumstances, especially for younger and rural women. In general, younger and older women, as well as homemakers in rural and urban areas, frequently lack the knowledge and abilities necessary to properly prepare and use plantain products. This disparity eventually affects Delta State's ability to secure food, underscoring the necessity of resolving these problems to encourage the plantain's successful usage as a staple crop and enhance household well-being.

Objectives of the Study

The general objective of this study was to examine the perceptions of homemakers regarding the processing and utilization of plantain products in Delta State, Nigeria. Specifically, the objectives of the study were to:

- a) determine homemakers' perceptions regarding how plantain products processing and utilization can boost their food security status in Delta State;
- b) identify required skills in processing and utilization of plantain products possessed by the homemakers to achieve food security;
- c) examine the difference between the perception of urban homemakers and rural homemakers on perceptions regarding how plantain products processing and utilization can boost their food security status in Delta State.
- d) find out if there is any difference between the mean (\bar{x}) responses of rural and urban homemakers on their perceptions regarding how plantain products processing and utilization can boost food security in Delta State

Research Questions

The following research questions were raised to guide the study:

1. What are homemakers' perceptions regarding how plantain products processing and utilization can boost their food security status in Delta State?
2. What required skills in processing and utilization of plantain products were possessed by the homemakers to achieve food security?

Hypotheses

The following null hypotheses were formulated to guide this study.

Ho₁: There is no significant difference between the responses of urban homemakers and rural homemakers on perceptions regarding how plantain products processing and utilization can boost their food security status in Delta State.

Ho₂: There is no significant difference between the perception of older homemakers and younger homemakers on the required skills in processing and utilization of plantain products possessed by the homemakers to achieve food security.

Methodology

The study adopted a descriptive survey design. In this type of study, the researcher uses questionnaires to determine the opinions, or perceptions of people. The target population of the study consisted of 236,315 female homemakers who deal with plantain products in Delta State. The study utilized a self-designed questionnaire in collecting respondents' opinions on the problem under investigation. The instrument was face validated by three experts; and the reliability was established using the test-retest reliability method which gave a correlation co-efficient of 0.80, showing that the instrument was reliable. Data were analyzed with Mean (\bar{x}) and standard deviation (SD). A mean of 2.50 and above was used as the bench mark for accepting an item as 'Agreed' and below 2.5 was regarded as disagreed. The t-test analysis was further used to test the stated hypotheses at 0.05 level of significance.

Results

Table 1: Bio-data of Homemakers in Delta State (n = 309) S/N

SN	VARIABLE	FREQUENCY	PERCENTAGE
1	Location		
	Rural	113	36.6
	Urban	196	63.4
	Total	309	100
2	Age		
	Below 40 years	165	53.4
	40 years & above	144	46.6
	Total	309	100

Table 1 presents the bio-data of homemakers in Delta State. Majority (63.4%) of the homemakers' lives in urban areas, while the remaining 36.6% lives in rural areas. Responses on their location shows that 53.4% are below 40 years of age, and 46.6% are above 40 years.

Research Question One

What are homemakers' perceptions regarding how plantain products processing and utilization can boost their food security status in Delta State?

Table 2: Mean (\bar{x}) and Standard Deviation Scores of Homemakers Perception Regarding Processing and Utilization of Plantain Products (n = 309)

SN	ITEM	\bar{x}	SD	Decision
1	Plantain processing and utilization can boost my household food security	3.47	0.50	Agreed
2	Afford me cheaper source of food if I can process and utilize plantain	3.61	0.49	Agreed
3	Elderly, diabetic and health-conscious people do demand the plantain product, making it a hotcake.	3.52	0.50	Agreed
4	homemakers would make times three, at least, of their regular incomes if they could process their plantain into flour	3.03	0.84	Agreed
5	Homemakers' household can have food supply all through the year as a result of Plantain flour sealed in plastic sachets, which could be kept for many months without deterioration in qualities	3.06	0.82	Agreed
6	Fried unripe plantain value chain also offers an attractive option	3.50	0.50	Agreed
	Grand Mean (\bar{x})	3.37	0.61	Agreed

Table 2 presents the mean (\bar{x}) and standard deviation scores of homemakers' perceptions regarding how plantain products processing and utilization can boost food security status in Delta State. The results showed that items 1 – 6 had a grand mean (\bar{x}) score of 3.37, above the cut-off mean score of 2.50, and a standard deviation of 0.61. Also, the mean scores for each item was above the acceptable cut-off mean (\bar{x}) score of 2.50. This indicated that homemakers have positive perception regarding the processing and utilization of plantain products.

Research Question 2: What required skills in processing and utilization of plantain products were possessed by the homemakers to achieve food security?

Table 3: Mean (\bar{x}) and Standard Deviation Scores on the Required Skills Possessed by Homemakers in Processing and Utilization of Plantain Products (n = 309)

SN	ITEM	\bar{x}	SD	Decision
Plantain Flour				
1	I am able to sort plantains appropriately and weighed to measure input of the raw plantain.	3.53	0.50	Agreed

2	I am able to absorb the green plantain fruits in to boiling point water for a few minutes to soften the skin for simple peeling.	3.52	0.50	Agreed
3	I am able to peel plantain using sharp blades to obtain the mash.	3.51	0.50	Agreed
4	I am able to cut plantain and dry in a brief span with the guide of an industrial drying machine.	2.97	0.82	Agreed
5	I am able to sieve the flour to obtain the craving molecule estimate.	3.59	0.49	Agreed
6	I am able to package the flour in dampness proof packaging material.	2.48	1.04	Disagreed
7	Ability to know that unripe plantain flour is used to lowers cholesterol, triglycerides in the blood	2.44	1.11	Disagreed
8	Ability to understand that it is used to combat a range of symptoms associated with erectile dysfunction	2.39	1.23	Disagreed
9	Ability to understand that unripe plantain contains antioxidant compounds that help to generates a slow release of glucose, prevent colon cancer, constipation	2.44	1.12	Disagreed
Plantain chips				
10	I am able to inspect plantain fingers to recognize and evacuate unsatisfactory ones	3.52	0.50	Agreed
11	I am able to dry/process plantain cuts/chips in a sledge process.	2.48	1.09	Disagreed
12	With the guide of a mechanical slicer, I am able to cut the mash.	2.37	1.08	Disagreed
13	I am able to use the manual plantain slicer	3.48	0.50	Agreed
14	I am able to package the chips in dampness proof packaging material prepared.	2.46	1.01	Disagreed
15	I understand that plantain chips serves as an energy booster, a source of vitamins like A, B3, and D.	2.38	1.16	Disagreed
16	I understand that plantain chips serves as a source of income	3.53	0.50	Agreed
17	I understand that plantain chips helps the body to gain weight	3.50	0.50	Agreed
Biscuit				
18	I am able to identify different sizes of baking pans used	2.44	1.10	Disagreed
19	I know the time required for cooling the products are 45 minutes for 310g sample	2.40	1.12	Disagreed
20	I know that cooling time depends on the size of the biscuit	2.49	1.31	Disagreed
21	I understand that reconciliation of sales and expenditure determines profits or loss of the enterprise	2.44	1.23	Disagreed
22	I know it helps the body to absorb iron	2.31	1.21	Disagreed
23	I know it is a source of income	3.52	0.50	Agreed
24	I know plantain biscuits are rich in vitamin K which helps in blood clots.	2.16	1.20	Disagreed
Plantain Puree				
25	I am able to Peel off the back of plantain; dice and put in a pot. Add the rest of the ingredients except vegetables and put to boil.	3.50	0.50	Agreed
26	I am able to cook plantain for 15-20 minutes or till plantains are soft and top with water if it is getting dry.	3.46	0.50	Agreed
27	I am able to add the vegetables, simmer for a minute and remove from heat.	3.50	0.50	Agreed
28	I am able to use blender to make the puree.	2.43	1.21	Disagreed
29	I know the fiber/complex carbohydrate content gives a feeling of satisfaction when consumed	2.26	1.22	Disagreed
30	I understand that plantain puree keeps the body feeling full longer	2.98	0.81	Agreed
31	I know it helps baby gain weight	2.93	0.78	Agreed

32	I understand that plantain has both antioxidant and anti-inflammatory properties and protects little ones from diseases	2.47	1.12	Disagreed
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Table 3 revealed the mean (\bar{x}) and standard deviation (SD) scores of the required skills possessed by homemakers in processing and utilization of plantain products to achieve food security in Delta State. The results showed that 15 items, that is, item 1, 2, 3, 4, 5, 10, 13, 16, 17, 23, 25, 26, 27, 30, and 31 had mean (\bar{x}) scores greater than the acceptable cut-off Mean (\bar{x}) of 2.50, indicating that homemakers agreed that they possessed those skills in processing and utilizing plantain products. However, the remaining 17 items (6, 7, 8, 9, 11, 12, 14, 15, 18, 19, 20, 21, 22, 24, 28, 29, and 32) had their Mean (\bar{x}) scores less than the acceptable cut-off mean score of 2.50, showing that homemakers disagreed to the possession of those skills involved in processing and utilization of plantain products. The analysis implies that homemakers perceived possessing some required skills in processing and utilization of plantain products to achieve food security.

Hypothesis One

There is no significant difference between the mean (\bar{x}) responses of rural and urban homemakers on their perceptions regarding how plantain products processing and utilization can boost food security in Delta State.

Table 4: Summary of t-test analysis on the mean (\bar{x}) responses of rural and urban homemakers on their perceptions regarding how plantain products processing and utilization can boost food security

Respondents	N	(\bar{x})	SD	Df	t-value	p-value	Decision
Rural	113	2.69	0.81	307	2.83	0.005	Reject Ho
Urban	196	3.16	0.81				

p<0.05

Table 4 shows a t-value of 2.83, and a p-value of 0.005 and an alpha level of 0.05. The hypothesis was therefore rejected since the p-value is less than the alpha level. This implied that there was a significant difference between the mean (\bar{x}) responses of rural and urban homemakers on their perceptions regarding how plantain products processing and utilization can boost food security in Delta State.

Hypothesis Two

There is no significant difference between the mean (\bar{x}) responses of the required skills possessed by young and old homemakers in processing and utilization of plantain products to achieve food security.

Table 4: Summary of t-test analysis on the mean (\bar{x}) responses of the required skills possessed by young and old homemakers in processing and utilization of plantain products

Respondents	N	(\bar{x})	SD	Df	t-value	p-value	Decision
Young Homemakers	165	3.52	0.50	307	-2.48	0.01	Reject Ho
Old Homemakers	144	3.06	0.48				

p<0.05

Table 4 shows a t-value is -2.48, a p-value is 0.01 and an alpha level of 0.05. The hypothesis was therefore rejected since the p-value is less than the alpha level. This implies that there was a significant difference between the mean (\bar{x}) responses of the required skills possessed by young and old homemakers in processing and utilization of plantain products to achieve food security.

Discussion

The first finding of the study, as indicated in Table 2 shows that homemakers have positive perception regarding the processing and utilization of plantain products. The respondents indicated that they are receptive to the process and utilization of plantain products for food security in Delta State. The corresponding hypothesis as indicated in Table 4 revealed that there was a significant difference between the mean (\bar{x}) responses of rural and urban homemakers on their perceptions regarding how plantain products processing and utilization can boost food security in Delta State. This simply means that urban homemakers are more informed on how to utilize plantain products to boost food security in Delta State, than their rural counterparts. The perception of homemakers regarding plantain utilization are in line with Udomkun et al., (2021) who pointed out that the disparity urban and rural women's processing and utilization of plantain draws attention to the different methods used to process plantains and how those methods affect food security. Hence, Udomkun et al., (2021) and Kouamé et al. (2015) pointed out that urban women differ significantly from rural women when it comes to the processing and utilization of cassava. The direction of this study finding is due to the fact that urban women have greater access to contemporary processing tools, which enables them to produce goods with additional value like flour and plantain chips, potentially increasing their earnings

The second finding of the study, as indicated in Table 3 revealed that homemakers perceived possessing some required skills in processing and utilization of plantain products to achieve food security. Some of the processing and utilization skills include ability to sieve the flour to obtain the craving molecule estimate, sort plantains appropriately and weigh to measure input of the raw plantain, understand that plantain chips serves as a source of income, absorb plantain into boiling point water for a few minutes to soften the skin for simple peeling, among others. Furthermore, the null hypothesis in Table 5 revealed that there was a significant difference between the mean (\bar{x}) response of the required skills possessed by young and old homemakers in processing and utilization of plantain products to achieve food security. The high mean (\bar{x}) score from old homemakers implies that they possess more processing and utilization skills than the younger ones. The skills possessed by homemakers are in line with the procedures identified by Dzomeku, et al. (2011) on processing of plantain to make flour, biscuit, chips, and other products. Thus, perceptions of the necessary skills for plantain processing vary significantly between old and young generations, shaped by factors like access to resources and cultural influences. The finding is also in line with Kuyu and Bereka (2019) who maintained that older married women generally possess greater skills and knowledge in processing plantain products, relying on cultural practices and traditional recipes. Their methods, such as boiling and frying, emphasize heritage and time-tested techniques over the years.

Conclusion

The study concludes that homemakers have positive perception regarding the processing and utilization of plantain products and that difference existed between rural and urban homemakers on the skills possessed by homemakers in processing and utilization of plantain products to achieve food security in Delta State. This implies that homemakers in the study area possessed the skills necessary for processing and utilization of plantain products, amongst which are ability to sieve the flour to obtain the craving molecule estimate, and sort plantains appropriately and weigh to measure input of the raw plantain. It was also concluded that difference existed between the mean (\bar{x}) responses of the required skills possessed by young and old homemakers in processing and utilization of plantain products to achieve food security.

Recommendations

The following recommendations were made based on the findings of the study.

1. Homemakers should be sensitized on how plantain products can be utilized to boost food security in Delta State.
2. Homemakers should be exposed to the skills required in processing and utilization through various training modes such as television, social media, among others.
3. More training should be given to homemakers in the rural areas, as they seem to have little idea on how plantain products can be effectively utilized than those in the urban areas.
4. Capacity-building programmes should focus on training the young homemakers on the skills needed in the processing and utilization of plantain products, as they seem to be lacking more in the skill areas than their older counterparts.

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