



COSTS AND RETURN ANALYSIS OF CASSAVA PROCESSING INTO "AKPU" IN LAFIA METROPOLIS, NASARAWA STATE, NIGERIA

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ABSTRACT

This study analysed the costs and return of cassava processing into 'Akpu' in Lafia Metropolis, Nasarawa State, Nigeria. The specific objectives aimed to identify the socio characteristics of 'Akpu' processors, to determine the costs and return and hence the profitability of 'Akpu' processing, and to identify the constraints faced by processors in the study area. A purposive sampling technique was used in selecting (60) females across five cluster in the study area. Primary data were collected through structured interviews, analyzed using descriptive statistics and gross margin analysis. The result showed that all the processors that were female. Furthermore, it was revealed that 80% of the respondents were engaged in 'Akpu' production on full time basis, indicating that it serves as primary source of income for this category of processors. Majority, (90%) of producer utilize personal savings as source of their initial capital. Also, the results indicated that 91.66% were married. The gross margin analysis revealed that for every ¥1 invested, a return of 27% was realised with a net profit of N236,952. High costs of labour ranked highest (64.63%) of the production cost. The study concluded that processing cassava into Akpu in the study area is profitable. The study recommends that research scientist, especially Agricultural Engineers should intensify research to come up with affordable modern equipment in processing 'Akpu' in order to cut production cost and thereby increase the profitability of 'Akpu' production.

Keywords: Akpu, Costs, Return, Cassava, Processing.

INTRODUCTION

In many tropical regions, cassava (*Manihot esculenta*) is an essential staple crop that provides millions of people with a significant amount of food and income globally. It is essential to both food security and economic stability in these areas because of its adaptability and durability. For farmers, processors, and policymakers to maximize output and enhance livelihoods, they must, nevertheless, comprehend the expenses and benefits related to cassava processing. Costs associated with processing cassava into different products include labor, raw materials, utilities, and equipment. In many tropical regions, cassava (*Manihot esculenta*) is still a staple crop because it offers both economic and nutritional advantages. One of its derivatives, "akpu" (fufu), is a staple fermented cassava product that is widely consumed in Nigeria and other parts of West Africa. A number of cost factors, such as raw materials, labor, utilities, transportation, and equipment maintenance, affect how economically efficient it is to process cassava into akpu. Understanding these cost elements is essential for streamlining production procedures and raising profitability, claim Okoye *et al.* (2020). According to Olatunde (2019), labor accounts for approximately 40-60% of the total processing cost in small-scale cassava processing enterprises in Nigeria.

Owusu-Sekyere *et al.* (2018) found that the initial investment in processing equipment accounted for 20-30% of the total processing cost for cassava processing units in Ghana.





According to Onyeka *et al.* (2017) transforming cassava into value-added products like akpu can significantly enhance rural incomes and livelihoods.

Cost and return analysis of processing of cassava tubers into akpu has not been given adequate attention in spite of its acceptability among dwellers of Lafia metropolis. The specific objectives of this study were to:

- i. describe the socio-economic characteristics of respondents;
- ii. determine the costs and return of processing cassava into Akpu; and
- iii. identify the constraints faced by Akpu processors in the study area.

The findings of this study will provide valuable insights into the economic viability of cassava processing into Akpu, which can inform sound decision-making, policy formulation, and interventions to support the development of the cassava value chain and improve the livelihoods of those engaged in cassava-based enterprises.

MATERIALS AND METHOD

Study Area

The research was conducted in Lafia Metropolis of Nasarawa State, Nigeria. Lafia was chosen due to its significant position in cassava production and processing into products such as akpu within the region. The area's prominence in cassava activities makes it an ideal location for studying the economic aspects of cassava processing into akpu. According to the FAO (2019), Nasarawa State is one of the key players in Nigeria's cassava industry, contributing substantially to both local consumption and national cassava production. This setting has provided a rich context for examining the cost and return dynamics of cassava processing. The methodology for the research titled "Cost and Return Analysis of Cassava Processing into Akpu in Lafia Metropolis of Nasarawa State, Nigeria" encompasses several key steps to ensure a comprehensive and accurate analysis

Sampling Technique and Sample Size

A purposive sampling technique was used to select a representative sample of cassava farmers and akpu processors. This technique is suitable for selecting participants who possess specific characteristics or expertise relevant to the study. By focusing on individuals with direct experience in cassava processing, the study has gathered detailed and relevant information. The sample size was determined based on the population of cassava processors in Lafia metropolis and the research objectives. Onyeka *et al.* (2017) support purposive sampling in agricultural research for its ability to ensure that knowledgeable participants are included.

Data Collection

Primary data were collected through structured questionnaires and interviews with cassava farmers, akpu processors, and market participants in Lafia Metropolis. The structured questionnaires were designed to gather quantitative data on production costs, processing methods, market prices, revenue, and profitability. Interviews will provide qualitative insights into the challenges and opportunities faced by stakeholders in the cassava processing value chain. Nweke *et al.* (2019) and Ayinde *et al.* (2018) highlight the importance of collecting detailed and accurate primary data to understand the economic implications of agricultural practices. Secondary data was sourced from relevant literature, government reports, agricultural databases, and publications related to cassava production and processing. This data has provided a comparative framework and contextual background for the study. The use of secondary data has enriched the analysis by offering benchmarks and trends observed in





similar studies. FAO (2020) and Agwu *et al.* (2021) stress the value of integrating secondary data to validate and complement primary data findings

Data Analysis

Data for this study were analysed using descriptive statistics such as mean, median, and standard deviation were employed to summarize the data, providing a clear overview of the key metrics. Gross margin analysis, was employed to identify relationships between cost factors and profitability. Creswell (2014) notes that combining descriptive and inferential statistics helps derive meaningful insights from research data.

Model Specification

Simple descriptive statistics such as average and percentage was used to achieve the broad objectives: i. Whole farm analysis was employed to achieve objective ii Mathematically, it is expressed as;

Method of Data Analysis: Simple descriptive statistics such as average and percentage was used to achieve the broad objectives i. Whole farm analysis was be employed to

achieve object ii. This is one major method of determining the profitability of an enterprise and it is mathematically expressed as;

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\pi = TR - TC \dots (1)
where:
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 $\pi = \text{profit}$

TR = Total Revenue

TC = Total Costs. TR = Pq

Where:

P = price per unit of out put

q = quantity of output

i. **Margin Gross Analysis**: Gross Margin was used to achieve objectives iii. The model of Gross margin that was use is:

GM=TR-TVC(2)

TC = TFC + TVC $ROI = \pi / TC \times 100$

Where:

GM=Gross Margin

TR=Total Revenue

TFC =Total Fixed Costs

TVC=Total Variable Costs

RESULTS AND DISSCUSSION

Socio-economic Characteristics Distribution of Akpu Producers in Lafia Metropolis

The results in Table 1 shows the socio-economic characteristics distribution of Akpu producers. It indicates that producers are predominantly made up of middle-aged. The findings revealed that 36.67% fell within the age of 30 - 39 years, while 33.33%, 21.67% and 8.33% fell within the age of 40 - 49, 20 - 29 and 50 and above years respectively. This age distribution suggests that the majority of producers are in their active working years, which can be beneficial for productivity and the adoption of innovative akpu practices (Ogunniyi, 2018).

Marital status among Akpu producers showed that most (91.66%) were married, indicating stable family support systems that can contribute to agricultural activities. The





small percentages of divorced (1.67%) and widowed producers (6.67%) reflect a generally stable social structure. The high rate of marriage among producers can enhance labor availability and resource pooling within households, potentially improving the efficiency of Akpu production (Adewale and Nwankwo, 2021).

In terms of education, a considerable number of producers (50%) lack formal education, while 38.33% have attained primary education, and only a small fraction has secondary (10%) and tertiary education (1.67%). This low educational attainment may limit access to modern akpu techniques and information, potentially affecting productivity and profitability. Additionally, the household size distribution reveals that most producers (71.33%) have between 5 to 9 members in their households, suggesting a workforce that can assist in agricultural activities. The relatively large household sizes could also imply a greater demand for resources, affecting the economic dynamics within the communities where Akpu production occurs (Olayide and Afolabi, 2020).

Variable	Frequency	Percentage
Age (Years)		
20 - 29	13	21.67
30 - 39	22	36.67
40 - 49	20	33.33
50 - 59	3	5.00
60 and above	2	3.33
Marital Status		
Married	55	91.66
Divorced	1	1.67
Widowed	4	6.67
Educational level		
No formal education	30	50.00
Primary education	23	38.33
Secondary education	6	10.00
Tertiary education	1	1.67
Household size		
\leq 4	8	13.33
5-9	43	71.33
10-15	8	13.33
16 and above	1	1.67

Table 1: Socio-economic Characteristics of Akpu Producers in Lafia Metropolis

Source: Field survey 2024

Table 2 revealed that 35% of the respondents has less than 5 years' experience of Akpu production relatively limited production experience. While 26.67%, 21.66%, 10% and 6.67% of the producers had experience of 11-15, 6-10, 16-20 and 21years and above respectively. This is coupled with a strong reliance on personal savings for financing, as 96.67% of producers utilize their savings rather than loans. Majority (80%) of the producers were engaged in Akpu production full-time, indicating that it serves as a primary source of livelihood. Additionally, all producers purchase cassava directly from farm gates, reflecting a well-established supply chain within the community. Similar findings have shown that





smallholder farmers often rely heavily on personal savings, which can limit their ability to invest in modern akpu practices and technologies (Urbano *et al.*, 2022).

In terms of income levels, a significant proportion of producers (36.67%) earn between \$501,000 - \$1,000,000, while 35% fell within the \$1,100,000 - \$1,500,000 range. However, only a small percentage exceeds an income of \$2,000,000, suggesting limitations on higher earnings. The data indicates a potential for growth and profitability within the Akpu production sector, emphasizing the importance of access to credit and investment opportunities for enhancing production efficiency and increasing income levels among producers. Studies have highlighted that access to credit facilities is crucial for increasing agricultural productivity and income among smallholder farmers (Obikeze *et al.*, 2020).

Overall, the reliance on personal savings and the limited income levels of Akpu producers illustrate the need for targeted interventions to improve financial access and support the development of this sector. Strengthening supply chains and providing educational resources on financial management can help farmers increase their income and production efficiency, ultimately leading to a more sustainable akpu practice (Akinwumi *et al.*, 2021).

Variable	Frequency	Percentage
Production experience (Years)		
<i>≤</i> 5	21	35.00
6 – 10	13	21.66
11 - 15	16	26.67
16 - 20	6	10.00
21 and above	4	6.67
Source of Finance		
Personal savings	58	96.67
Loans	2	3.33
Status of Producers		
Full time	48	80.00
Part-time	12	20.00
Sources of Cassava		
Purchased at farm gates	60	100.00
Income Levels (N)		
\leq 500,000.00	4	6.67
501,000 - 1,000,000	22	36.67
1,100,000 - 1,500,00	21	35.00
1,510,000 - 2,000,000	8	13.33
> 2,000,000	5	8.33

Table 2: Distribution of Akpu Processors Based on Socioeconomic Characteristics

Source: Field survey 2024

Costs and Returns of Akpu Production in Lafia Metropolis

Table 3 shows the costs of Akpu production in Lafia are primarily driven by variable expenses, with labor being the largest component. Labor costs amount to \$560,000 per month, representing 64.63% of the total variable costs, followed by raw cassava, which costs \$300,000 (34.10%). Other minor variable costs include water and packaging sacks, each





contributing less than 1% of the total. Fixed costs, mainly due to the depreciation of equipment such as plastic drums and knives, are minimal, totaling \aleph 1,247.54 per month.

Items	Unit Price (N)	Total Amount	% of Total	
		(N)/month	Amount (N)	
Variable cost		· ·	• •	
Raw cassava/month	150,000	300,000	34.10	
Labour/month	28,000	560,000	64.63	
Water/month	5,000	5,000	0.57	
Sacks for packaging/month	600	4,800	0.54	
Total		869,800	99.86	
Fixed cost		Depreciation	%	
Plastic drum		462.96/month	0.053	
Knife		175.00	0.002	
Basket		166.67	0.018	
Mortal		55.33	0.006	
Plastic container (Bowl)		250.00	0.028	
Leather		300.00	0.034	
Total		1,247.54/month	100.00	

Source: Field survey 2024

Revenue Generated from Akpu Production in Lafia Metropolis

Revenue from Akpu sales is the primary income source, generating \$1,092,000 per month, accounting for 95.56% of the total revenue. Additionally, cassava peel sales contribute \$16,000, bringing the total monthly revenue to \$1,108,000. Despite the high labor costs, the production process remains profitable, with the potential for increased efficiency in labour to further improve returns.

ItemsPrice/pickup load (N)Amount (N)% of Average Total incomeAkpu546,0001,092,00095.56Cassava peel2,00016,0001.44Total revenue1,108,000100

Table 4: Revenue Generated from Akpu Production in Lafia Metropolis

Source: Field survey 2024

Net Profit

ROI

Constraints to Akpu Production in Lafia Metropolis

Table 4 reveals the key constraints to Akpu production in Lafia include a lack of processing equipment (20.82%) and inadequate storage facilities (20.72%), both of which significantly hinder efficiency and post-harvest handling. Financial limitations also pose a challenge, with 20.00% of producers citing inadequate capital. Additionally, the high cost of cassava (18.55%) and the increasing cost of processing equipment (18.91%) further strain production efforts, making it difficult for producers to sustain or expand their operations.

236,952

27.2

These challenges collectively affect the profitability and growth of Akpu production in the area.





Constraints	F	%
Inadequate storage facilities	57	20.72
Inadequate capital	55	20.00
High cost of cassava	51	18.55
Lack of processing equipment	60	20.82
Increasing cost of processing equipment	52	18.91
Total	275	100.00

Table 5: Constraints to Akpu Production in Lafia Metropolis

Source: Field survey 2024

CONCLUSION AND RECOMMENDATIONS

The study concludes that Akpu processing is a profitable and lucrative business in the study area and women are the majority involved in the business. Though lucrative but faced challenges principally inadequate storage facilities and inadequate modern processing equipment.

The study recommends the followings: Research scientist especially Agricultural Engineers should intensify research to come up with affordable modern equipment's in processing cassava into akpu; Government Agency such as Small and Medium Size Enterprise (SMSE) should consider producers of akpu for financial support so as to improve the value chain of cassava processing in the study area.

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