COMPARATIVE ANALYSIS OF THE PROFITABILITY OF CASSAVA PROCESSING ENTERPRISES IN ODUKPANI LOCAL GOVERNMENT AREA, CROSS RIVER STATE, NIGERIA

***Gabriel N. Odok, Uket I. Ofem and Julia A. Effiwat**
Department of Agricultural Economics, Faculty of Agriculture,
University of Calabar, Calabar, Nigeria
**Corresponding author email: gabrielodok6@gmail.com*

Abstract
This study, titled Comparative Analysis of the Profitability of Cassava Processing Enterprises in Odukpani Local Government Area of Cross River State, Nigeria, specifically examined the profitability and constraints of cassava processing enterprises that focused on garri, fufu, and starch products. The specific objectives included determined processing costs and returns, estimated gross margins, compared profitability by scale (micro and small), and identified socio-economic factors that influenced profit levels. Data were collected from 133 processors using a multi-stage sampling technique and analysed using descriptive statistics, budgetary analysis, a mean difference model, and multiple linear regression. Results showed that cassava processing is profitable, garri recorded the highest gross margin (₦9, 349.5/50 kg), followed by fufu (₦6,689.7/50 kg) and starch (₦4,087.4/50 kg). Micro-scale processors (0–9 employees) were significantly more profitable (mean gross margin: ₦30,168.10) than small-scale processors (₦19,091.18) at a 5% significance level. Socio-economic factors such as income (10%), educational level (1%), marital status (5%), and processing experience (10%), significantly influenced profitability. However, most processors faced challenges that included expansion constraints (72.2%), competition (69.2%), and limited access to grants (68.4%), while over 80% required financial support and modern equipment to enhance productivity. The study concluded that targeted interventions in finance, capacity building, and mechanization are critical to improving efficiency, reducing costs, and enhancing profitability in the cassava processing sector of Odukpani. This study contributed to the existing literature by providing empirical evidence that micro-scale cassava processing enterprises in Odukpani Local Government Area generate significantly higher gross margins than small-scale enterprises.

Keywords: Comparative, profitability, Cassava, processing, Enterprises

Introduction

Cassava (*Manihot esculenta*) is a versatile and staple crop, that originates from South America, where it was domesticated by indigenous populations over 10,000 years ago. It was introduced to Africa by Portuguese traders in the 16th century and quickly became an important part of the continent's agriculture due to its adaptability to diverse soil types and climatic conditions. Globally, cassava serves as a primary carbohydrate source for more than 800 million people, making it one of the most cultivated crops in the tropics (Food and Agriculture Organization [FAO], 2013). Its resilience to harsh weather

conditions and ability to thrive in nutrient-poor soils have embedded its position as a crucial crop for food security and poverty alleviation.

In Africa, cassava is widely cultivated across sub-Saharan countries, contributing significantly to food security, rural livelihoods, and economic growth. The crop's versatility allows for its use in multiple forms, including *garri*, *fufu*, starch, and ethanol, etc., which are essential for household consumption and industrial purposes. Nigeria, the world's largest cassava producer, contributes 59 million metric tons and exports 3.2 million tons annually, accounting for approximately 20% of global production (International Institute of Tropical Agriculture [IITA], 2017). This dominance is attributed to Nigeria's vast and highly fertile arable land, favourable climatic conditions, and the role of cassava as a staple in the diets of its population.

Cassava cultivation in Nigeria is widespread, with significant production in some States such as; Benue, Kogi, Ondo, and Cross River. Cross River State, located in South-South geopolitical zone of Nigeria, is renowned for its fertile soils and favourable climate, making it a leading cassava-producing area (Industrial Policy Bureau, Cross River State Government, n.d.). Odukpani Local Government Area is situated within one of the state's favourable agro-ecological zones, providing suitable environmental conditions for cassava cultivation and processing activities. Within this area, farmers engage in cassava cultivation as a staple and cash crop, with processing activities playing a vital role in value addition and income generation.

Odukpani is vital and fundamental to the cassava value chain in Cross River State. Smallholder farmers and processors largely dominate the area, producing value-added products such as *garri*, *fufu*, and starch for local consumption and regional trade within the state. However, despite the area's potential, the profitability of cassava processing enterprises remains constrained by socio-economic, infrastructural, and environmental challenges. Understanding the dynamics of cassava processing in this region is essential to improve its economic viability and address the constraints faced by processors.

The socio-economic characteristics of cassava processing enterprises in the study area provide valuable insights into their operational dynamics. These enterprises are typically family-owned and operated, with a significant proportion of women being involved in the processing activities. Women, who often serve as the backbone of rural economies, play critical roles in transforming raw cassava into consumable and marketable products (Nweke *et al.,* 2002). Studies have shown that cassava processing enterprises are predominantly micro to small-scale in size, often family-owned, and provide income and employment opportunities for rural households. (Akubo *et al.,* 2023). The micro scale processors mostly use manual labour and traditional methods for processing, while small-scale processors adopt semi-mechanized or mechanized methods for processing. Other factors such as age, education level, etc., also significantly contribute to the efficiency and profitability of these enterprises.

Understanding the processing costs incurred by the cassava enterprises in the study area is essential for evaluating their economic viability. These processing costs, generally include operations, such as peeling, fermenting, pressing, frying, and packaging activities. A study by Adejumo*, et al.* (2020) has highlighted those micro and small-scale processors often face higher unit costs due to their reliance on inefficient and traditional post-harvest technologies/methods. Conversely, medium and large-scale processors benefit from economies of scale and have better access to mechanized equipment, which reduce costs and improve efficiency. Analysing these costs will provide insights into the economic dynamics of the cassava processing enterprises and identify opportunities for cost reduction.

The objectives of this study were to:

i. determine the processing costs and returns associated with cassava processing enterprises in the study area.
ii. determine the gross margins of the various cassava processing enterprises in the study area.
iii. examine the profitability levels by scale (i.e. micro and small) of the cassava processing enterprises in the study area.
iv. examine the socio-economic characteristics that influence the profit levels of the cassava processing enterprises in the study area.

Research Methodology

Study Area

This study was carried out in Odukpani Local Government Area (LGA) in Cross River State, Nigeria. Odukpani LGA is amongst the leading cassava processing areas in Calabar Agricultural zone, because of its fertile land, history of cassava cultivation and processing as shown in a recent study, by Agbachom *et al*. (2024). The area is situated at latitude 5°4'52.46"N and longitude 8°20'59.7"E and has an elevation of approximately 413ft. Odukpani LGA experiences a tropical humid climate with distinct wet and dry seasons. The area has an average relative humidity of approximately **80–85%** throughout the year. The annual rainfall ranges between 2,000 mm and 4,000 mm, with average daily temperatures ranges from 22 to 25^{0}C (NIMET, 2012), that create favourable conditions for cassava cultivation. The fertile soil, which is a mix of sandy and clayey soils, further supports agricultural productivity. The communities in Odukpani include: Akpap Okoyong, Eki, Eniong Abatim, Ito, Idere, Ukwa Ibom, Creek Town, Inuakpa Okoyong, and Okurikang. The local government has a population of approximately 257,800 people. (Eludoyin, 2014). Odukpani LGA is also characterized by diverse agricultural practices, with a focus on crops such as cassava, yams, maize, and plantains. These agroeconomic characteristics place Odukpani LGA as a significant agricultural hub within the Calabar Agricultural Zone.

Sampling procedure

The multi-stage sampling technique was employed for the study. In stage one, three communities (Okurikang, Inuakpa Okoyong and Akpap Okoyong,) known for cassava production were purposively selected from the ten communities that

make up Odukpani Local Government Area. In stage two, the Cochran's formula was used in this case to calculate the sample size, due to the lack of data of registered cassava processors in the local government area. The formula is given below:

$n= z^2pq/e^2$

where;

n= Sample size

z^2 = Z-score (based on confidence level)

P = Estimated proportion of the population with the characteristic (if unknown, 0.5 is used for maximum variability)

q = 1-p

e^2 = Margin of error

- z^2= 1.96 (confidence level of 95%)
- p= 0.50
- e^2= 8.5%

$n=1.96^2\times0.50(1-0.50) \div 0.085^2 = 133$

Therefore, a sample size of 133 cassava processors was adopted for the study. In the absence of a formal sampling frame of cassava processors, a field-based random sampling approach (household and enterprise listing with key informant assistance) was adopted. First, with the help of local leaders and extension agents, a temporary list of identifiable cassava processors in each selected community was generated. From this list, respondents were then selected using a simple random sampling technique to ensure that every identified processor had an equal chance of selection. There was a random selection of forty-five (45) processors from one community, and forty-four (44) processors each from the other two communities making a total of (133) processors. Out of the 133 respondents, 78 were micro-scale processors while 55 were small-scale processors**.**

Data Collection

Primary data were collected through the administration of structured questionnaires to cassava processors. Information obtained included socioeconomic characteristics, processing costs and returns, enterprise scale, access to credit, extension services, processing constraints, and profitability indicators.

Data analysis

Data were analyzed using descriptive statistics, budgetary and econometric tools. The socioeconomic characteristics of the respondents were analyzed using descriptive statistics. Objectives one and two were analyzed using budgetary tools, while objectives three and four were analyzed using mean difference and regression models respectively.

Gross Margin (GM)

GM = TR -TVC

Where; GM= Gross Margin (#/ha)

TR= Total Revenue (#/ha)

TVC= Total Variable Cost (#/ha)

Mean Difference Model

$$t= \frac{(X_1 - X_2)}{\sqrt{\frac{S_{21}}{n_1} + \frac{S_{22}}{n_2}}}$$

Where;

t = Independent Samples t-Test (Welch)

X_1= Mean of Gross margin for Micro-scale enterprises.

X_2 = Mean of Gross Margin for Small-scale enterprises.

n = Number of observations

S_{21}= Variance of X_1

S_{22}= Variance of X_2

Model specification

The profitability model was specified to determine the influence of selected socio-economic and enterprise characteristics on profit levels of cassava processing enterprises. Profit (₦) was used as the dependent variable, while age, income, marital status, gender, education, processing experience, number of employees, enterprise scale, access to credit, cooperative membership, access to extension services, and household size were included as explanatory variables.

Regression Analysis

A multiple regression model was specified and estimated using the Ordinary Least squares method.

$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \ldots\ldots. \beta_{11} X_{11} + Є$

Where;

Y= Profit (₦)

X_1= Age (Years)

X_2= Income (₦)

X_3= Marital Status (Married=1, Not Married= 0)

X_4= Gender (Male=1, Female=0)

X_5= Highest Educational level attained (Number of Years spent in School)

X_6= Processing Experience (Years)

X_7= Number of Employees (Number)

X8= Access to Credit (1= Access, 0= No Access)

X9= Association/Cooperative (1= Yes, 0= No)

X_{10}= Access to extension services (1= Yes, 0=No)

X_{11}= Household Size (Number of Persons)

β_0= Intercept

β_1- β_{12}= coefficients to be measured

Є= error term

Results and Discussion

Socioeconomic Characteristics of Cassava Processors in the Study Area

Table 1 shows that most respondents fall within the 30–49 years age range, showing that cassava processing in Odukpani was carried out by middle-aged individuals who are more resourceful and experienced in enterprise management. Majority (37%) were married, which aligns with the family-based nature of rural enterprises and provides access to family labor, reducing external labor dependence. Gender distribution is nearly balanced, with a slight male dominance, reflecting men's stronger role in managerial positions, while women remain central to actual processing activities (Ayi *et al*., 2022).

The results show that most of the respondents (65.4%) had one form of formal educational or the other, with only 34.6% of the respondents having no formal education. This implied that most of the cassava processing operators were averagely educated and have the ability to adopt modern processing technologies and better business practices. The result is in line with that of Akubo *et al*. (2023) and Adejumo *et al*. (2020).

Table 1 also revealed that the mean years of experience was 9 and that most of the respondents (70.6%) had cassava Processing experience ranging from 6 to 20 years, indicating that the cassava processing operators have sustained their businesses for a relatively long period, may be due to high turnover. The results also showed that average household size was 7 persons and 55.5% of the respondents have family sizes ranging from 4 to 11 persons which implied that cassava processing enterprises in the study area have available family labour to

Table 1: Socioeconomic Characteristics of Cassava Processing Operators in the Study Area

Characteristic	Processors	Percentage %	Mean ($\bar{x}$)
Age (Years)			
18 and below	10	7.4	
19–29	22	16.3	
30–49	55	40.7	37 years
50–69	40	29.6	
70 and above	6	4.4	
Gender			
Male	69	51.1	
Female	64	47.4	
Marital Status			
Single	40	29.6	
Married	50	37.0	
Divorced	22	16.3	
Widowed	21	15.6	
Education Level			
No formal education	46	34.6	
1–6 years	30	22.6	
7–12 years	33	24.8	
13 years+	24	18.0	
Experience (Years)			
≤ 5	40	29.6	
6–10	35	25.9	
11–15	29	21.5	9 years
16–20	17	12.6	
≥ 21	12	8.9	
Household size (No. Of Persons)			
≤ 3	58	43.0	
4–10	42	32.1	7 persons
≥ 11	33	24.9	
Training			
Yes	51	37.8	
No	82	63.2	
Cooperative Membership			
Yes	36	26.7	
No	97	73.3	
Loan Access			
Yes	49	36.3	
No	84	63.7	
Extension Service Access			
Yes	44	32.6	
No	89	67.4	
Employees (No. of Persons)			
None	59	44.36	
1–5	30	22.56	

6–9	27	20.30	
10+	17	12.78	
Monthly Income			
≤ ₦5,000	2	1.50	
₦6,000–₦10,000	10	7.52	
₦11,000–₦20,000	33	24.81	₦16,400
₦21,000–₦30,000	36	27.07	
₦31,000–₦50,000	16	12.03	
₦51,000+	36	27.10	

Source: Field Survey, 2025

assist in most of processing tasks. The results revealed that 63.2% of the respondents had no training on modern processing methods which could build their processing capacity and efficiency as well as increase their ability to adopt improved techniques (Abiodun *et al*., 2023).

Cooperative membership was also low (Table 1), as only 26.7% of the respondents as against 73.3% were members of cooperative societies. This may hinder collective bargaining power and access to loans of cassava processing enterprises in the study, thereby reduce their ability to invest in modern machinery or expand operations (Agbaeze *et al*., 2020).

Furthermore, the results showed that 67.4% of the respondents had no extension contact, implying that most of the cassava processing do not access to technical guidance and market information critical for business improvement. Most enterprises are micro-scale as shown by table 1, with more than 44.36% having no employees, and therefore rely largely on family labour (SMEDAN, 2013; Adejumo *et al*., 2020). Equally, the table showed average monthly income of cassava processors in the study area was ₦16,400.00 and that the income levels vary widely, with 27.10% of the cassava processing operators earning above ₦51,000 monthly, where as 60.90% earn between ₦5,000–₦30,000 monthly, indicating that there could be differences in market access, production scale, and efficiency (Akubo *et al*., 2023).

Determination of Processing Costs, Returns and Gross Margins of Cassava Processing Enterprises per 50 kg of Fresh Cassava Tubers in the Study Area

The results of cassava enterprises processing cost, returns, and profitability for garri, fufu, and starch per 50 kg of cassava tubers is presented in Table 2. The results revealed that garri recorded the highest total cost (₦13,100.00) and total revenue (₦18,950.00), resulting in a gross margin of ₦6,650.00 and net income of ₦5,850.00 per 50 kg of fresh cassava tubers processed in the study area. Its higher profitability is attributed to its strong market demand, better shelf-life, and relatively high selling price. These findings are consistent with Umoren (2008) and Mafimisebi (2023), who reported that garri remains the leading cassava product in terms of profitability.

The results also revealed that Fufu had a total cost of ₦11,500.00, total revenue of ₦15,400.00, gross margin of ₦4,700.00, and

a net income of ₦3,900.00. Fufu actually yielded more weight 22.1kg from the 50 kg of fresh cassava processed in the study area, but its average selling price is lower thereby resulting in a lower gross margin than that of garri. Moreso, its gross margin is lower than that of garri, mainly due to higher perishability and shorter shelf life, which limit its marketability (Adejumo *et al*., 2020).

The results from Table 2, also showed that starch recorded the lowest total cost (₦11,000.00), total revenue (₦15,000.00, and gross margin of ₦3,800.00, with a net income of ₦4,000.00. Its relatively low profitability can be attributed to limited market demand and higher per-unit processing costs, as similarly observed by Umoren (2008) in Oruk Anam Local Government Area of Akwa Ibom State.

Table 2: Average Costs and Returns associated with Cassava Processing enterprises in the Study Area

Item	Garri /50 kg cassava	Fufu /50 kg cassava	Starch /50 kg cassava
A. Variable Costs (₦)			
Fresh cassava tubers (50 kg @ ₦120/kg)	6,000	6,000	6,000
Peeling cost (₦)	1000	1000	1000
Washing cost (₦)	200	200	200
Grating/Crushing cost (₦)	1500	700	1500
Fermentation cost	300	500	--
Dewatering/Pressing	500	500	400
Sieving	300	200	500
Roasting/Drying	1,000	300	500
Packaging	500	400	500
Transportation	500	500	300
Miscellaneous	500	400	300
Total Variable Cost (TVC)	**12,300**	**10,700**	**10,200**
B. Fixed Cost Allocation (₦)			
Equipment depreciation	500	500	500
Rent/Utilities	300	300	300
Total Fixed Cost (TFC)	800	800	800
Total Cost (TC)	13,100	11,500	11,000
C. Output and Revenue			
Output from 50 kg cassava	14.6 kg	22. 1 kg	10. 0 kg
*Selling price (₦/kg)	1,300	700	1,500
Total Revenue (TR)	18,950	15,400	15,000
D. Profitability Analyses			
Total Revenue (₦)	18,950	15,400	15,000
Total Cost (₦)	13,100	11,500	11,000

Net Profit (₦)	**5,850**	**3,900**	**4,000**
Gross Margin (₦)	6,650	4,700	3,800
Benefit–Cost Ratio (BCR)	1.45	1.34	1.39
Return on Investment (ROI)	44.7%	33.9%	27.8%

*Averge market price, 2025

Source: Field Survey, 2025

Estimation of the mean gross margin by scale (i.e. micro, and small) of the cassava processing enterprises in the study area

The results on Tables 3 and 4, presented the statistical summary of the gross margin of cassava processing enterprises by scale and the independent samples t-Test results of the mean gross margin of cassava enterprises by scale in the study area. The results revealed that micro cassava processing enterprises (with <9 employees) recorded a higher mean gross margin of ₦30,168.10, as compared to that of small-scale processors (with 10 and above employees), ₦19,091.18.

Table 3: Distribution of Descriptive Statistics for the Processing of Cassava Enterprises by scales (Micro and Small)

Enterprise Scale	N	Mean Gross Margin	Std. Deviation	Std. Error
Micro	116.00	30168.10	29983.00	2783.85
Small	17.00	19091.20	17258.00	4185.68

Source: Field Survey, 2025

The results on Table 3, independent-samples Welch's t-Test revealed a statistically significant difference in mean gross margin between micro-scale enterprises (M = ₦30,168.10, SD = ₦29,983.00, n = 116) and small-scale enterprises (M = ₦19,091.20, SD = ₦17,258.00, n = 17), t (31) = 2.20, p = .035. The findings indicate that micro-scale enterprises earned significantly higher gross margins than small-scale enterprises. The higher profitability among micro-scale processors may be attributed to lower operational costs, greater reliance on family labour, and reduced financial risks, which align with the findings of Oyewole *et al*. (2006) and Adejumo *et al*. (2020), who emphasized that micro-processors in rural cassava value chains often achieve better gross margins due to minimal overhead costs and localized operations. On the other hand, small-scale processors, while having the potential for higher production capacity, tend to incur higher labour, energy, and marketing costs, which erode their gross margins. This aligns with the results of Abiodun *et al*. (2023) that small-scale enterprises in Nigeria often face structural inefficiencies and higher variable costs when scaling up operations.

Table 4: Results of the Independent Samples t-Test (Welch) of Mean Gross margins of Cassava Enterpries by Scale

Statistic	Value
Mean Difference (Micro − Small)	11,076.90
Standard Error of Difference	5,027.14
t-value	2.20
Degrees of Freedom (Welch)	≈ 31
Two-tailed p-value	0.035
Decision (α = 0.05)	Reject H_0

Source: Field Survey, 2025

Ordinary Least Square Multiple Regression Results of Socioeconomic factors influencing the profitability of cassava processing in Odukpani LGA

Table 5 shows the OLS Regression results of the socioeconomic factors influencing profitability of cassava processing. The four functional forms (Linear, Semi-log, Double-log and Exponential) were applied to determine the lead equation and as presented in Table 5. Several statistical factors were considered (R-squared, Adjusted R-squared, significance of coefficients, and overall model significance (F-statistic and Prob (F-statistic)). The linear regression model had the highest R^2 of 0.743 and an Adjusted R^2 of 0.568, indicating that 56.8% of the variation in profitability was explained by the socioeconomic variables included. It also had the highest number of significant variables and was chosen as the lead equation The F-statistic (F = 3.217; p = 0.001) was significant at the 1% level, demonstrating that the model was a good fit for the data. Based on this, the null hypothesis (H_0) is rejected, confirming that socioeconomic characteristics significantly influence the profit levels of cassava processing enterprises in the study area.

The coefficients for age (b= -88.860), cooperative membership (b= -932.440) and extension contact (b= -8,129.059), were negative and not significant. However, estimated coefficient of number of employees was negative and significant at 1% (b= -2,104.593; P = 0.012), indicating that employment of more labour will increase cost of production affect the profit level of cassava processing enterprises, in the study area. The table also revealed that the estimated coefficients of gender and household size were positive but not significant.

Table 5: Ordinary Least Square Multiple Regression Results of Socioeconomic factors that influence the profitability of cassava processing in Odukpani LGA.

Variable	Linear	Semi-log	Double-log	Exponential
Constant	524.954	-78,713.281	1,265.035	596.755
	[0.969]	[0.107]	[0.769]	[0.619]
Age	-88.860	-3,131.173	-255.310	-4.905
	[0.653]	[0.692]	[0.715]	[0.78
Income	0.317***	7,868.001*	68.074	0.008
	[0.058]	[0.063]	[0.855]	[0.581]
Marital status	11,470.326**	11,793.387**	-495.810	-556.773
	[0.025]	[0.022]	[0.274]	[0.220]
Gender	6,099.742	6,233.331	712.014*	658.998
	[0.207]	[0.199]	[0.098]	[0.127]
Education	1,659.883*	13,449.204***	-270.909	-47.524
	[0.001]	[0.000]	[0.417]	[0.258]
Experience	721.054***	7,113.721	323.621	30.410
	[0.088]	[0.233]	[0.539]	[0.533]
No. of employees	-2,104.593**	-14,149.835**	-1,245.462**	-152.464**
	[0.012]	[0.024]	[0.025]	[0.041]
Access to credit	145.728***	6,156.045	548.656	490.433
	[0.084]	[0.285]	[0.282]	[0.339]
Membership coop. association	-932.440	-761.748	117.208	74.470
	[0.872]	[0.895]	[0.819]	[0.885]
Extension contact	-8,129.059	-7,386.606	-775.658*	-782.918***
	[0.119]	[0.161]	[0.097]	[0.093]
Household size	739.619	6,252.007	793.083**	114.297***
	[0.331]	[0.169]	[0.050]	[0.094]
R-squared	0.743	0.235	0.117	0.111
Adjusted R-squared	0.568	0.158	0.029	0.022
F-statistic (p-value)	3.217* (0.001)	3.068* (0.001)	1.326 (0.213)	1.250 (0.257)

Figures in parentheses are t-values; * Significant at 1%; ** Significant at 5% ; ***Significant at 10%

Source: Field Survey, 2025

The results on Table 5, showed that the coefficient for Income was Positive and significant at 10% (B = 0.317, p = 0.058), implying that cassava Processors with higher income levels had better capacity for reinvestment in inputs and equipment, leading to improved profitability. This result corroborates with the result of Adejumo *et al*., (2020) who found out that farmers with better income levels have greater capacity invest in agricultural ventures and make more profit.

Marital Status was also Positive and significant at 5% (B = 11,470.33, p = 0.025), implying that cassava processors who were married often benefit from family labor and shared household resources, thereby reducing operational costs and enhancing profit. This result agrees with that of Nweke *et al.*, (2002) who opined that the use of family labour reduces variable cost of production and increases profit level.

Educational Level in Table 5 had a Positive and highly significant coefficient at 1% (B = 1,659.88, p = 0.001). This implied cassava processors with higher education levels have enhanced access to improved processing techniques and better managerial decisions and improve their profit levels (Akubo *et al*., 2023).

Results on Table 5 showed that the coefficient for processing experience was Positive (B = 721.05, p = 0.088) and significant at 10%, implying that cassava processors with more experience were better positioned to manage costs, negotiate markets, and maximize returns (Adejumo *et al*., 2020).

The study results also found out that the coefficient of access to credit was positive and significant 10 % (B= 145.728; P = 0.084), indicating that with better access to credit facilities, profit level will increase.this can be attributed to the fact with increased access to credits, cassava enterprises will expand production,invest in modern processing equipment to improve production efficiency and profitability. The findings align with that of Akubo *et al*. (2023).

Conclusion

This study established that cassava processing enterprises in Odukpani LGA are profitable, with micro cassava processing enterprises generating significantly higher gross margin net returns than small-scale ones due to lower operational costs and family-based labor. Gross margin analysis revealed that garri was the most profitable product, followed by fufu and starch. Socio-economic factors such as education, income, and access to credit significantly influenced profit levels, while challenges including expansion lhimitations, competition, and poor access to grants constrained growth.

Recommendations

1. Promotion of Garri Processing Enterprises: Since garri recorded the highest gross margin and is the most profitable product, efforts should focus on strengthening garri processing through provision of modern equipment, improved storage facilities, and market linkages. This will allow processors to maximize returns and maintain product quality.

2. Support for Micro-Scale Processors: Micro-scale processors were found to be more profitable than small-scale ones due to lower operational costs and reliance on family labour. Interventions should target micro-enterprises with low-cost tools, shared processing facilities, and technical support to sustain their profitability.

3. Improved Access to Credit Facilities: Since income and credit access significantly influenced profitability, expanding affordable micro-credit schemes and low-interest loans tailored to cassava processing enterprises will increase their ability to invest in raw materials, hire labor, and adopt improved technologies.

4. Capacity Building and Training: Education and training positively affected profitability. Organizing skill-enhancement workshops on processing techniques, record-keeping, and enterprise management will improve efficiency, reduce wastage, and raise profit margins.

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