

## **Fermented Cassava Flour Marketing in Owerri Metropolis of Imo State, Nigeria**

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**Abstract:** Fermented cassava flour marketing in Owerri metropolis of Imo State, Nigeria was investigated. Purposive and simple random sampling methods were respectively used to select four markets and 60 respondents from the markets. Data were obtained with copies of well structured questionnaire administered to the respondents via personal interview. Analyses of data were actualized by means of descriptive statistics, Shepherd-Futrell and multiple regression techniques. Profitability analysis gave mean net marketing incomes of ₦64300 and ₦4250 and net return of investment values of 0.64 and 0.24 for the wholesalers and retailers respectively. The wholesalers were more efficient than the retailers in the business. Net marketing income was statistically and significantly influenced by gender, marketing cost and household size, while age, marketing experience, educational level and product price were not significant. Problems militating against fermented cassava flour marketing were poor sales, lack of marketing activities such as advertising, poor knowledge of fermented cassava flour, poor and instable price, preference for substitutes like wheat, lack of capital and high transportation cost. Provision of soft loans and subsidization of cost of transportation through government investment in urban mass transit and railway infrastructures will improve income and profit of the marketers.

**Keywords:** Fermented cassava, Owerri metropolis, marketing income, Imo State, Nigeria

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### **INTRODUCTION**

Cassava (*Manihot esculenta crantz*) is a perennial crop which originated from south America and is grown in over ninety countries of the world, mostly in the tropics where it constitutes one of the most important sources of energy in the diet and provides livelihood for over 500million people [1]. It is the most important staple food crop in Nigeria and in recent years has become an important industrial raw material for food and starch based industries. Cassava-based farming communities coped better in hunger stressed times and uncomfortable situations [2].

Cassava can be processed into various wet and dry product forms, which are eaten by both rural and urban populace. A market survey conducted in 2005 identified four common wet cassava-based products as cassava fresh roots, edible starch, fermented paste and cooked fufu, and four common dry cassava-based products as garri (which can come either in white or yellow form), fermented cassava flour, cassava chips and “abacha”. Among the dry products, fermented cassava flour is unique because it does not only serve as food but also possesses latent import substitution opportunities [3]. Cassava roots can be stored in the ground for up to 24months and some varieties for up to 36months before harvesting for marketing, processing,

and other conditions [4]. These attributes make cassava important produce for food security in Nigeria and several other sub-saharan African countries that produce the crop.

Dixon opined that in 1989 Nigeria became the world’s largest producer of cassava through the support of International Institute of Tropical Agriculture (I.I.T.A.) and other international and national root crops programmes in Africa [5]. According to Onwueme, the preliminary stages in the making of cassava flour are similar to those for making cassava chips[6]. The fresh roots are peeled, washed and cut into longitudinal slabs. The slabs are allowed to dry thoroughly in the sun before usage or stored for future use. When the flour is needed, the dry slabs are milled to produce grayish-white flour. Fermented cassava is a popular mode of cassava consumption in southern Nigeria. Preparation of the flour is one of the traditional ways of preserving and adding value to cassava roots that is practiced widely in Africa.

According to Kotler and Keller, marketing is a management function which organizes and directs all those business activities involved in assessing and converting customer’s purchasing power into effective demand for a specific product or service to the final

consumer or user so as to achieve the profit target or other objectives set by the company [7]. The essence of the marketing is for transaction, an exchange intended to satisfy human wants or needs. The need for marketing arises and grows as a society move from an economy of subsistence agriculture and self sufficiency to an economy built around division of labour, industrialization and urbanization of the population [8].

Owerri metropolis of Imo State with its rising population provides ready market for a lot of cassava products including fermented cassava flour. Marketing of fermented cassava flour is a common feature of most markets in the study area because it is one of the cheapest sources of carbohydrate, hence the preference for most low income consumers. Demand for fermented cassava flour in the area is increasing because it is one of the cheapest cassava root products, however, supply of the product is lagging behind demand probably due to marketing constraints such as high purchase price of the product, high cost of transportation, inadequate and poor storage facilities and other marketing problems as reported by Kohls and Uhl on the marketing of agricultural products [9], on fresh maize marketing and Ugwumba on the agribusiness of catfish marketing [10]. This is the genesis of the study aimed at analyzing fermented cassava flour marketing in Owerri Metropolis of Imo State, Nigeria. Findings of the study will provide information for designing marketing policies that will improve fermented cassava flour marketing by policy makers; taking investment decisions by existing and prospective investors; proffering solutions to marketing problems of the marketing agents by research institutions; and beefing-up literature on fermented cassava flour marketing.

## MATERIALS AND METHODS

The study was carried out in Owerri metropolis of Imo State, Nigeria. The state is located in Southeast Nigeria, at longitude 6°31' and 8°10' East, and latitude 4°45' and 6°17' North. Owerri metropolis has a population of about 278,088 (National Population Commission (N.P.C.), [11] and an area of 94.28km<sup>2</sup>. The people engage in several productive and income generating activities such as civil service jobs, trading, artisanship, fashion designing, hair dressing, hotel services, transport services, and others. There are four main markets in Owerri metropolis, namely Eke Ukwu, New market, Relief market, and World Bank market, adorned with agricultural produce of all sorts, yam, garri, plantain, maize, okro, fruits, vegetables, fermented cassava flour, and others.

The study population included all the fermented cassava flour marketers operating in markets in the area. Four daily main markets were purposively selected because of the volume of transactions and the number of marketing agents operating in the markets. From each of the four selected markets,

random sampling method was used to select 5 wholesalers and 10 retailers to arrive at a total of 60 respondents (20 wholesalers and 40 retailers) for the study.

Cross sectional data were collected for the study using copies of pre-tested structured questionnaire administered to the fermented cassava flour marketers by personal interview. The enterprise budgeting technique was used to analyze data on profitability of the enterprise while operational efficiency levels of the intermediaries were achieved using Sherpherd-Futrell method of determining marketing efficiency [12]. Finally, the determinants of net marketing income/profit and constraints to marketing were ascertained using multiple regression technique and descriptive statistics respectively.

The enterprise budgeting was done as:  $\Pi = \sum R_i - (V_i + F_i)$

Where:

$\Pi$  = Profit (₦)

$\sum$  = Summation

$R_i$  = Revenue of the ith marketer (₦)

$V_i$  = Variable cost of the ith marketer (₦)

$F_i$  = Fixed cost of the ith marketer (annual depreciation value/interest on loan) (₦)

The Sherpherd-Futrell method used in determining operational efficiencies of the marketers is given as:  $\sum(V_i + F_i) / \sum R_i$ , and

The multiple regression analysis used to ascertain the determinants of profit realized from fermented cassava flour marketing is given as:

$$\Pi = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_7 X_7 + e$$

Where:

$\Pi$  = Profit / Net marketing income (₦)

$X_1$  = AGE = Age (years)

$X_2$  = GEN = Gender (dummy: male= 1; female = 0)

$X_3$  = MKE = Marketing experience (years)

$X_4$  = EDL = Educational level (years)

$X_5$  = MKC = Marketing cost (₦)

$X_6$  = HOS = Household size (₦)

$X_7$  = PDP = Product price (₦)

$\beta_i$  = Parameters to be estimated

$e_i$  = Error term.

Four functional forms of the regression model were tried with the data and the form with the best output in terms of signs, sizes and number of significant variables was used as the lead equation. Explicit expressions of the forms are stated as:

Linear:  $\Pi = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_7 X_7 + e$

Exponential:  $\text{Ln}\Pi = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_7 X_7 + e$

Semi-log:  $\Pi = \beta_0 + \beta_1 \text{Ln}X_1 + \beta_2 \text{Ln}X_2 + \dots + \beta_7 \text{Ln}X_7 + e$

$$\text{Double-log: } \ln\Pi = \beta_0 + \beta_1\ln X_1 + \beta_2\ln X_2 + \dots + \beta_7\ln X_7 + e$$

## RESULTS AND DISCUSSION

The estimated enterprise budgeting for fermented cassava flour marketing in the study area involving gross margin and net marketing income for profitability in terms of sales and net return on investment for profitability in terms of investment is shown in Table 1. The total variable cost for wholesaling of fermented cassava flour was ₦1,940,000 while the total fixed cost was ₦54,000 per month. The total revenue realized from fermented cassava flour marketing by the wholesalers was ₦3,280,000, resulting to a gross margin of ₦1,340,000 and a net marketing income/profit of ₦1,286,000.

On the other hand, the total variable cost for retailing of fermented cassava flour was ₦690,000 while the total fixed cost was ₦10,000 per month. The total revenue for fermented cassava flour was ₦870,000, resulting to a gross margin of ₦180,000 and a monthly net marketing income of ₦170,000 for the retailers. The respective monthly mean net marketing incomes for the wholesalers and retailers were ₦64,300 and ₦4,250; and net return on investment values were 0.64 and 0.24, implying that the wholesalers and retailers returned 64kobo and 24kobo per 100kobo investment respectively. By these results, fermented cassava flour marketing in the area was a profitable venture for both the wholesalers and retailers.

**Table 1: Monthly profitability of fermented cassava flour marketing**

Variable	Middlemen	% of TC	Wholesalers	% of TC	Retailers	% of TC
Total revenue	4050000	-	3280000	-	870000	-
Variable cost:						
Purchases	2560000	95.03	1900000	95.2	660000	94.2
Transportation	40000	1.48	20000	1.00	20000	2.85
Loading	7000	0.25	5000	0.25	2000	0.28
Off-loading	7000	0.25	5000	0.25	2000	0.28
Association due	4000	0.14	2000	0.10	2000	0.28
Storage	6000	0.22	4000	0.20	2000	0.28
Security	6000	0.22	4000	0.20	2000	0.28
TVC	2630000	-	1940000	-	690000	-
GM (TR-TVC)	1420000	-	1340000	-	180000	-
Fixed cost (FC)						
Rent	26000	0.96	20000	1.00	6000	0.85
L.G. rate	14000	0.51	10000	0.50	4000	0.57
Depreciations	24000	0.89	24000	1.20	-	-
TFC	64000	-	54000	-	10000	-
NMI=GM-TFC	1356000	-	1286000	-	170000	-
Mean NMI	22600	-	64300	-	4250	-
Total cost (TC)	2694000	-	1994000	-	700000	-
NROI	0.50	-	0.64	-	0.24	-

Source: Field survey, 2013. Notes: L.G. = Local government.

### Marketing Efficiency

Operational efficiencies of marketing of fermented cassava flour by the wholesalers and retailers were determined using the Shepherd-Futrell method which is stated as:

$$\text{Marketing efficiency (ME)} = V_i + F_i / TR \times 100/1$$

For the middlemen, ME = 2694000/ 4050000 x 100/1 = 66.52%

For the wholesalers, ME = 1994000/3280000 x 100/1 = 60.79%

For the retailers, ME = 700000/870000 x 100/1 = 80.46%

The intermediaries (wholesalers and retailers) recorded marketing efficiency of 66.52%, the wholesalers 60.79%, and the retailers 80.46%. This implied that the intermediaries, wholesalers and

retailers respectively expended 66.52%, 60.79% and 80.46% of their sales revenues on costs. This also means that the wholesalers, who were mostly male marketers, were more efficient in the business than the retailers. This result disagrees with Ugwumba[13] on catfish marketing, Nnabuike *et al.* on smoke-dried fish marketing both in Anambra State, Nigeria where the retailers were more efficient than the wholesalers in the marketing of the products [14].

### Determinants of the respondents' marketing profit

The multiple regression analysis was used to predict the effect of socio-economic factors of the respondents on earned profit. The independent variables were marketer's age represented by (AGE), gender (GEN), marketing experience (MKE), educational level

(EDU), marketing cost (MKC), household size (HOS), and product price (PDP). The data were fitted to four functional forms (linear, exponential, semi-log and double-log) of the regression model and tried by means of MINITAB statistics. The result is shown in Table 2. Out of the four regression outputs, output of the semi-log form was the best in terms of number of significant variables, value of F-statistic, R<sup>2</sup>, and R<sup>2</sup> adjusted and was then chosen as the lead equation.

Out of the seven (7) regressors included in the model, the respondents' gender, marketing cost, and household size had statistical and significant influences on profit, while other four variables namely age, marketing experience, educational level, and product price were not significant. Furthermore, the coefficient of multiple determination of 0.789 implied that 78.9% of the variation in profit realized by the marketers was accounted for by variations in the independent factors. The F-statistic value of 27.74 was significant and indicated that the socio-economic variables together significantly influenced profit.

The coefficient of marketing cost had positive relationship with profit and was statistically significant at 5% probability level. This implied that the marketers who had their marketing costs increased by increasing their investments in the business earned higher profit as a result of the action.

It could also be seen from Table 2 that gender had negative and statistically significant influence on profit. This implied that gender was a sensitive factor in determining the amount of profit realized in the business; hence the female marketers were more likely to earn better profit from fermented cassava flour marketing than their male counterparts.

The coefficient of household size was negative and statistically significant at 5% level, implying that the marketers with large household size realized lower profit from the business than those with small household size. It could be that the marketers with large household size consumed more quantity than was marketed leading to reduced revenue and profit.

**Table 2: Estimated determinants of profit realized by the respondents**

Variables	Linear	Exponential	Semi-log	Double-log
Constant	2770.1 (3.27)	3.51154 (48.03)	-19761 (-3.51)	1.6821 (3.53)
AGE	5.584 (0.72)	0.0004627 (0.70)	708.2 (0.85)	0.05858 (0.83)
GEN	-233.6 (-2.00)**	-0.01766 (-1.75)**	-82.57 (-2.20)**	-0.006239 (-1.96)**
MKE	-3.78 (-0.30)	-0.000302 (-0.28)	-18.0 (-0.06)	-0.00103 (-0.04)
EDL	-24.58 (-1.07)	-0.001786 (-0.90)	-613.8 (-1.02)	-0.04485 (-0.88)
MKC	1.3690 (11.94)**	0.00011091 (11.22)**	8790.6 (12.56)**	0.71711 (12.11)**
HOS	-61.30 (-2.21)**	-0.004792 (-2.00)**	-856.1 (-2.79)**	-0.06881 (-2.65)**
PDP	-0.2151 (-0.91)	-0.00001818 (-0.90)	-1463 (-1.02)	-0.1236 (-1.02)
R <sup>2</sup>	77.3%	74.9%	78.9%	77.5%
R <sup>2</sup> (adj)	74.2%	71.5%	76.0%	74.5%
F-stat.	25.25	22.12	27.74	25.57
D-W stat	1.53	1.64	1.52	1.61

Source: Field survey, 2013. Note: \*\* = Significant at 5% probability level. F-stat = F- statistic. D-W stat = Durbin-Watson statistic. Figures in ( ) are t- statistic values.

### Problems of fermented cassava flour marketing in the study area

The problems militating against fermented cassava flour marketing in the area (Table 3) included poor sales, lack of marketing activities such as advertizing, knowledge of fermented cassava flour, poor and instable price, preference for substitute like wheat, lack of capital and high cost of transportation.

The result indicated severity of the problem as follows: poor sales 100%, followed by lack of marketing activities such as advertizing 91%, knowledge of fermented cassava flour 86%, poor and instable price 83%, preference for substitute like wheat 66%, lack of capital 50% and high cost of transportation 33%.

**Table 3: Problems of fermented cassava flour marketing in the area**

Variable	Frequency	Percentage
Poor sales	60	100
Lack of marketing activities such as advertizing	55	91
Knowledge of fermented cassava flour	52	86
Poor and instable price	50	83
Preference for substitute like wheat	40	66
Lack of capital	30	50
High cost of transportation	20	33

Source: Field survey, 2013.

## CONCLUSION

Fermented cassava flour was an important source of carbohydrate in the diet of the low income residents of Owerri metropolis of Imo State, Nigeria. Though marketing the product was profitable, the marketers combined it with the marketing of other carbohydrate sources like wheat, maize, and guinea corn so as to realize higher net marketing income. Improvement in net marketing income earned from the business would be achieved if the problems identified by this study are addressed.

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