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Economics of Yam Flakes Processing and Distribution in Ogo-Oluwa Local Government Area of Oyo State, Nigeria

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Abstract: Yam flakes serve as important calories food item in Nigeria. They are cheap stable foodstuff for all categories of people. Therefore, it becomes imperative to study the processing of yam into flakes. The main objective of the study, is to determine the economics of yam flakes processing in some selected villages of the study area. Data were collected from 187 respondents with a well structured questionnaire. Both descriptive and inferential statistics were used to analyze the information obtained from the respondents. Statistical analysis performed revealed that year of experience in processing was significantly related to revenue obtained ($R^2 = 0.569$). It also shows that the resources such as total input of yam tubers (kg), total labour input (mandays) and value of firewood in naira were over utilized, the study revealed that the enterprise is profitable since the average gross margin and net returned were positive.

Key words: Economics, distribution, calorics, foodstuff, yam flakes

INTRODUCTION

Food is a basic necessity for all human beings. It is the pivot around which human existence revolves. Everyone requires access to sufficient, balanced, safe and culturally acceptable food in a manner, which does not destroy one's dignity as a human being (United Nations Organization, 1989). Food is a top priority in the budget of every being hence agriculture should be given due attention in terms of regular and continuous investment at local, state and national government levels. This hopefully will lead to enhanced output which in turn should result in an improvement in the living standard and income earning capacity of rural populace (particularly farmers).

Man cultivates crops either as food for himself or as feed for his livestock. Very many types of food crops are cultivated and consumed within the geographical entity, Nigeria from the diversity in culture, taste and other abiotic factors such as weather, soil, rainfall, sunlight intensity and duration etc, which influenced what, where and when a particular crop can be cultivated. Food crops such as plantain, cocoyam, groundnut, rice, yam, millet, cassava, maize guinea corn, sweet potatoes can be found in the southwestern part of Nigeria, which encompasses rain forest and derived savannah ecological zones. Hectarage devoted to cultivation and harvestable output are two principle factors, which are used to judge the region where a particular crop is predominant (FAO, 2001) of the very many crops cultivated in Nigeria, four, which are regarded as major to southwestern area, are rice, maize, cassava and yam, based on the; proportion of the inhabitants that cultivate these crops, volume of output of these crops from this regions and contribution of these crops to the domestic economy (Afolabi, 1995).

Processing adds values to agricultural product by converting them into a form that is readily available and more acceptable to the consumers. Okoli and Onwueme (1987) believed that in the future yams would be consumed mainly as flakes and flour derived products and thus there is a need for yam based industrial projects in Nigeria. Yam flakes production is relatively simple. It calls for no major investment and provides an effective means for the product to boost its value. Yam flakes are stabilized products with a moisture content of about 12% and can be kept for up to a year when stored under insect proof conditions. Yam flakes are cheaper to transport than fresh tubers. They are not damage much by handling. Urban markets can be supplied with yams throughout the year if the market prices for yam flakes are relatively steady and stable. In the hard dry chip form, yams are competitive with respect to other starchy food that can be used on a variety of new ways. The flakes can be turned into granules or mixed into biscuits, baby food etc. small-scale industries are already developing new products based on yam flakes.

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The broad objective of the study, is to determine the economics of yam flakes processing by the processors in selected villages of the study area. The specific objectives are to:

- Identify and discuss the socio-economic characteristics of the participants in yam flakes processing.
- Determine profitability of yam flakes processing in the study area.
- Examine the constraints of rural processors to adopting modern processing techniques.
- Determine the efficiency of resource use in the processing of yam into yam flakes.

MATERIALS AND METHODS

According to IITA (2005) production is used for human food. Yam tubers are processed into various types of food, including pounded yam, boiled yam, roasted or grilled yam, fried yam slices, yam balls, mashed yams, yam chip and yam flakes.

Fresh yam tubers are also peeled, chipped, dried and milled into flour that is used to prepare dough called amala. Bogunjoko (1992) advised that quick processing of yam tubers reduce losses, provide adequate income and more food. This study identified three traditional processing methods as follows:

- Curing method in which peeled yam slices are parboiled and steeped in water overnight before drying.
- A short time curing that involves parboiling and steeping the yam slices for 2-12 h.
- A non-curing method in which tubers are peeled, sliced, washed and dried.

About half of the processors use the curing method. Yam flour, ground yam flakes particles used for human consumption is prepared traditionally. Yam tubers are peeled, sliced to a thickness of 1cm and sun dried; then ground to give coarse flour. When required, the flakes are reconstituted by stirring with boiling water to form pasty dough.

Eight rural communities, Ajawa, Odo-Oba, Olukosi, Otamokun, Araromi, Otun-Ayegun, Ikolaba and Lagbedu in Ogo Oluwa Local Government Area of Oyo State were chosen as the study locations. The choice of these locations was based on the predominance of yam processing occupation over other occupations in the local government area. Ogo Oluwa Local Government falls within the ecology of yam flakes producing area in Oyo State.

Yam cultivation and processing are major activities in the economy of individual farmer household in Ogo Oluwa Local Government Area of Oyo State and its environs {Ogo Oluwa Local Government (1991). Investors crude and pocket Map of Ogo Oluwa Local Government Area, Ajaawa}. It is a homogenous local government made of almost exclusively of the Yoruba ethnic group who speak the Yoruba language.

Data collection: The data was collect through the use of questionnaire administered using the interview schedule. Data collected include respondents' socio-economic characteristics such as age, household size and literacy level, years of involvement in yam flakes processing activities, volume of processing the yam flakes among processors, costs and returns to resources used, as well as problem constraining yam processing activities.

Analytical techniques: Descriptive statistics such as gross tabulation, percentages, mean, range and coefficient of variation were used to compare and contrast the values of selected socio-economic variables such as age, years of involvement in yam flakes processing activities, educational level, volume of processing within the yam flakes processors. An enterprise budget approach to estimate costs and returns in each of the two enterprise (yam processing) was undertaken so as to be able to compare profits among the different enterprises. The gross margin is given as

(GM) = Total revenue-total variable cost.
GM = Pq -C
GM = Gross Margin (N)
P = Price for relevant yam flakes produced
q = Quantity of relevant yam flakes produced
Pq = Total revenue
C = Variable costs incurred by relevant yam flakes component entrepreneurs.

Model specification: A production function was specified and estimated to determine the relationship between the output and the various inputs used. The estimated production function is the function of the form:

$$Y = (X_1, X_2, X_3, X_4, X_5, X_6)$$

Where,
Y = Amount realized from processed yam flakes (bags of elubo) per annum.
X_1 = Total input of yam tubers (kg).
X_2 = Total labour input (mandays).
X_3 = Capital tools (in naira).
X_4 = Value of firewood (in naira).

X_5 = Years of yam flakes processing.
X_6 = Years spent in a formal school.
μ = Error term.

The estimated equation form is Cobb-Douglas function

$$Y = aX_1^{b1} X_2^{b2} X_3^{b3} X_4^{b4} X_5^{b5} X_6^{b6} \mu \quad (1)$$

Transformed to the linear form by taking the log transformation. The equation is then written as:

$$\text{Lny} = \beta_0 + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + \beta_5 \ln X_5 + \beta_6 \ln X_6 + \text{Log}\mu \quad (2)$$

The model has many variables, which determine the revenue of the yam flakes processor. The dependent variable (Y) is the amount realized from processed yam flake (bags) per annum while the independent variables are total input of yam tubers (kg), total labour input (mandays) capital (tools) in naira value of firewood in naira, years of yam flakes processing years spent in a formal school. The dependent variable, amount realized from processed yam flakes (bags of yam flakes) is obtained by taking a product of price and quantity processed. The explanatory or dependent variables are expected to have positive coefficient in relation to the dependent variable which is amount realized from processed yam flakes (bags) per annum.

RESULTS AND DISCUSSION

Fifty seven percent of the respondents are female while 43% of the respondents are male. The result showed that yam flakes processing was popular as a business among the men in the area, women are usually well engaged in yam flakes processing because the business is not strenuous compared to farming activities which are popular among men. The study revealed that about 45% of the processors were between 31 and 40 years of age while about 5% of the respondents had their age to be above 50 years. This implies that those involved in processing of yam flakes are in their age and therefore have much energy to perform processing operations thereby enhancing their sales earning (Table 1).

The frequency distribution of marital status in which 62% of the processors were married, 8% of the respondents were separated and 21% of the respondents were single.

Education plays an important role in yam processing operations, it will facilitate the adoption of innovations that will improve processing of yam flakes, the result showed that 53% of the respondents had primary education, 26% had secondary education, 7% had vocational education, while 14% had tertiary education. This implies that it will be easier for the respondents to adopt innovation that will improve the business.

Result furtherly reveals that 23% of the respondents had been in the business for less than 10 years, while about 26% had an average of 25years of experience. This shows that majority of the respondents were highly experienced in the business have a positive effect in their business performance. Sixteen percent of the respondents sourced their funds from banks, 29% obtained their funds through friends and 21% sourced their funds from family, while 27% obtained funds from

Table 1: Demographic characteristics of yam flakes processors

	Frequency	(%)
Gender		
Male	80	42.8
Female	107	52.2
Age		
20-30	53	28.34
31-40	84	44.92
41-50	40	21.40
Above 50	10	5.34
Marital status		
Single	40	21.39
Married	116	62.03
Widowed	25	13.36
Separated	15	8.02
Educational level		
Primary	99	52.9
Secondary	47	25.1
Vocational	13	7.0
Tertiary	26	13.9
Processing experience		
<10	43	22.99
11-20	85	45.45
21-30	48	25.26
31-40	09	04.81
Above 40	02	01.08
Sources of funds		
Bank loan	30	16.04
Family	40	21.39
Friends	55	29.41
Personal saving	50	26.74
Co-operative	12	6.42
Storage method		
Shop	60	32.08
Barn	37	19.79
Warehouse	40	21.39
Home	50	26.74
Transportation method		
Commercial vehicle	72	38.50
Personal vehicle	50	26.74
Motorcycles	45	24.06
Wheelbarrows	20	10.69
Problems encountered		
Lack of capital	25	13.36
Insufficient barn/storage	50	26.74
Low sales	15	8.02
Transport	50	27.74
Pest and disease	30	16.05

Source: Field survey, 2007

Table 2: Profitability of the yam flakes processing

Items		(₦)
1	Total revenue	55150.27
2	Variable cost	
	i. Yam tubers	564.71
	ii. Transportation	282.00
	iii. Firewood	440.27
	iv. Labour	200.00
3.	TVC	1486.98
4	Fixed cost	
	i. Knives	473.85
	ii. Baskets	352.62
	TFC	
5	Total Cost (TVC+TFC)	2313.45
6	GM (TR-TVC)	53663.29
7	Profit (TR-TC)	52836.82

Source: Field survey, 2007

Table 3: Nutritional value of yam nutrient in 100 g edible portions

Material	Calorie ranges
Moisture	65.00-81.00
Protein (g)	1.40-3.50
Fat (g)	0.20-0.40
Carbohydrate (g)	16.40-31.80
Fiber (g)	0.40-10.00
Ash(g)	0.60-1.70
Calcium (mg)	12.00-69.00
Phosphorus (mg)	17.00-61.00
Iron (mg)	0.70-5.20
Sodium (g)	8.00-12.00
Potassium (mg)	294.00-397.00
B-carotene eq (mg)	0.00-10.00
Thiamine (mg)	0.01-0.11
Riboflavin (mg)	0.01-0.04
Niacin (mg)	0.30-0.80
Ascorbic acid	4.00-18.00

Source: Osagie (1992)

their personal saving and 6% sourced their funds from cooperative society. The implication of this is that the respondents sourced their funds from both institutional and non-institutional sources.

About 32% of the processors stored their produce in their shop, 20% made use of barns for storage, 21% used warehouse, while 27% of the respondents made use of their homes for storage. It was showed that 39% of the respondents transported their yam flakes through commercial vehicle, 27% transported yam flakes with their personal vehicle, 24% made use of motorcycles, while 11% of the respondents transported their produce with the use of wheelbarrows. Furthermore, the result revealed that 13% of the processors needed capital to increase sales and 27% complained of lack of good storage/ warehouse, 8% experience low sales, while 28% complained of transportation and 16% complained of damage and pest (Table 2 and 3).

CONCLUSION

This study investigated the economic of yam flakes processing. The study area is one of the principal yam flakes processing area of the state. Analysis of the socio-economic characteristics of the respondents show that 57% of the respondents were female while an average yam flake processors was 47.83years old.

The regression analysis shows the relationship between revenue and input used in yam flakes processing. This shows that yam tuber has a positive and significant coefficient of 0.373, which is significant at 1%. Firewood also have a coefficient of regression of 0.353 and its significant at 1%. Meanwhile, labour, capital, years of experience and years of formal education have no significant relationship with revenue. The gross margin was found to be N53663.29.

Result shows that yam flakes processing is a profitable enterprise. However, the processors were not efficient in their resource use of inputs. The following are recommended to improve the performances and the economic well being of yam flakes processors as well as the consuming public of the products. Yam processors should come together as union where resources can be pooled together. This will benefit all members, as there are seasonal variations among the crops. This strategy will imply a rotational and a year round use resources they accumulate.

Since some processors do not have enough capital base to put in place all the needed inputs such as store houses and associated components to facilitate smooth running of processing operations, owner of such facility should rent them out at an agree rate when they have no processing on hand.

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