



Analysis of Tigernut Processing and Marketing in Port Harcourt Local Government Area, Rivers State

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Abstract

The study analyzed the profitability of selected tigernut processors and marketers in Port Harcourt Local Government Area, Rivers State, Nigeria. Specifically, the study described the socio-economic characteristics of tigernut marketers and processors; described the channels of distribution linking the marketers and processors, ascertained their processing method, determined their marketing cost and return, and identified the constraints encountered by them. A multistage sampling technique was employed in selecting the sample size for the study. Data was collected using a structured questionnaire administered to 30 respondents. Descriptive statistics such as tables, means, frequency and distribution table, percentages, Gross Margin Analysis and Likert scale were used to collect the data. The result of the study showed that 63.3% of the sampled respondents are within the economically active age bracket of 31-40 years. About 63.3% of respondents are females while 36.7% are males, which shows that women are more involved in tigernut processing and marketing in the study area. About 70 % of the respondents were married, household size is about 63.3% of 6-10, Average level of experience is about 6-10years indicating that most of the marketers have been in the business for a long time and are therefore conversant with the problems of tiger nut processing and marketing in the study area and how to manage the risk involved in the business. Four distribution channels were identified, these are producers through wholesalers and retailers to consumers, producers through wholesalers to consumers, producers through retailers to consumers and producers to final consumers. The results also showed that a total variable cost (TVC) of N213100 was incurred during business while a total revenue (TR) of N603000 with a gross margin (GM) of N389900. The findings of the study also show that N0.65 was obtained as the rate of return which implies that for every N1 invested N0.65 kobo was gained by the respondents. The major identified constraints were multiple taxation, transportation, lack of finance and lack of processing machines while the minor constraint was storage.

Keywords: Tiger nut, Processing, Marketing

Introduction

Tiger nut is one of the crops with some vital nutritional and health benefits. Tiger nut (*Cyperus esculentus*), is a grass-like plant with spheroid tubers and, pale; a pale yellow cream kernel surrounded by a fibrous sheath. It is found wild and cultivated in Africa, South America, Europe and Asia. Tiger nuts grow in the wild, along rivers and are cultivated on a small scale by rural farmers mostly in the northern states of Nigeria. It was reported to be high in dietary fibre content, which could be effective in the treatment and prevention of several diseases (Pravst *et al.*, 2010; Mason, 2005). It is a rich source of quality oil and contains a moderate amount of protein. It is also an excellent source of some useful minerals such as iron and calcium which are essential for body growth and development (Oladele and Aina, 2007). Tiger nut is a perennial tuber or nut which is commonly cultivated or found wild in Northern Nigeria

(Nata'ala, *et al.*, 2018). It is known as "Aya" among the Hausas; "Ofio" among the Yorubas, and "Akiausa" among the Igbo (Umerie *et al.*, 1997). It is a spherical tuber with a sweet nutty flavour and can be eaten raw (fresh), baked, roasted, dried, or processed into non-alcoholic (tigernut milk) or a fermented alcoholic drink (Oladele and Aina, 2007; Bamishaiye and Bamishaiye, 2011). The fermented drink is widely consumed in Northern Nigeria, with some spices such as ginger, black pepper, or rosemary commonly included as additives (Kayode *et al.*, 2017). The waste products obtained after processing tiger nuts are used as a supplement in animal feeds, and for making bioethanol (Nata'ala *et al.*, 2018).

Unfortunately, despite the potentials in tigernuts, it has been a neglected crop in Nigeria. This probably may be due to inadequate knowledge on its production,

utilization and nutritional value. Tigernut could provide a basis for rural industries in Africa. It is an important food crop for certain tribes in Africa, often collected and eaten raw, baked as a vegetable, roasted or dried and ground flour. It has also been found to possess good therapeutic quality (Bixquert, 2003; Valls, 2003).

Tigernut can be processed into; tigernut oil, tiger nut milk/juice, tigernut flour, and the most common being the tiger nut milk/ juice. The edible and stable oil obtained from the tuber is said to be a superior oil that compares favourably with olive oil. The oil is golden brown and has a rich, nutty taste. Tiger nut milk/beverage/drink commonly called '*kunmu aya*' in northern Nigeria is a healthy drink with many nutrients. It is a nourishing and energetic product recommended by experts to be taken during any season of the year, especially in the dry season when the sun is hot as it is often served chilled. The marketing of tigernut in Port Harcourt local government area is an activity often indulged in by Northern youth on a small scale by selling the raw tubers in wheelbarrows at various junctions and roads and open market premises with the processed juice often sold by women who hawk them in small bottles stored with an ice block to help keep the juice chilled. Tiger nut is one of the underutilized tubers with great potential for domestic and commercial purposes. There is no documentation of a successful product made from tiger nuts in the Nigerian market. A successful product offers a benefit that is perceptible and valued by the consumer (NUTRA, 2005). There is little documentation on the nutritional quality and versatility of tiger nuts in food preparation despite their availability. According to Bamishaiye (2011). Ignorance of the nutritional value of tigernut is a major constraint in the utilization of tigernuts. Therefore, it is essential to analyze the processing and marketing of tigernut in Port Harcourt Local Government Area with the following specific objectives;

- i. determine the socio-economic characteristics of tiger nut marketers and processors in Port Harcourt LGA
- ii. examine the method of processing tigernut in the study area
- iii. determine the marketing channels of tigernut in the study area
- iv. determine the marketing costs and return of tigernut in the study area
- v. identify constraints associated with tigernut marketing and processing in the study area

Methodology

Study Area

The study was carried out in Port Harcourt City Local Government Area of River State, Nigeria. The area has a population of over 1,947,000 million people according to the National Population Commission (NPC, 2006). The area lies between latitudes 40.45/and 40.75/ North and longitudes East 70.50/ and 800. The area is bounded on the North and East by Obio/Akpo and Oyigbo Local

Government Area on the West. The Atlantic Ocean forms the southern boundary. It has a land mass of 360 km². The people in the area are mostly civil servants and marketers. Many staple foods are produced in the area including cassava, plantain and yam. Though tuber is not produced within the local government it is very marketable in the local government this is because Tigernut is widely accepted and because the study area has a large population for its marketability. Some major markets in the area were purposively selected for the study. The markets were chosen because they are the market with the highest concentration of Tigernut marketing activities.

Sampling Procedure and Sample Size

Multi-stage sampling was used in this study. In the first stage, fifteen (15) wards were chosen purposively out of the twenty (20) wards in Port Harcourt LGA because they engage more in Tigernut marketing, the ten (10) major markets were randomly selected from the 15 wards. The Selected markets were Mile 3, Mile1, Amadi-Ama, Navy Market, Rumuoamsi, Timber, D/Line, New Market and Creek Road market. Due to the small amount of tigernut marketers in the study area, the research made use of the entire population.

Data Analytical Techniques

Descriptive statistics such as simple percentages, frequency and mean and Gross Margin analysis, were used to analyze the obtained data.

Model Specification

Gross margin analysis=GM = TR – TVC

Where; GM = Gross margin

TR = Total revenue

TVC = Total variable cost.

Results and Discussion

Results

Table 1 shows the socioeconomic characteristics of respondents in the study area

The result on the socioeconomic characteristics of tiger nut marketers showed that 36.7% of the respondents were male, while 63.3% were female. Age of the respondents also indicated that ages 31-40 (63.3%), 21-30 (16.7%) and range from 40years and above (23.3%), apparently age of the respondents that fell within the mark of 20 years and below had a null percentage. Marital Status of the respondents showed that (70%) of the respondents were married. For household size, the results further indicated that (36.7%) of the respondents had ranges of 1 - 5 persons as their household size followed by (63.3%) of the respondents who indicated that 6-10 persons are their household size, and a null percentage was realized from the respondents on the range that had a household size of 11-15 persons. the result for marketing experience of the respondents indicated the following 1-5 years (46.7%), followed by the ranges of 6-10 years (53.3%) while 11-15years had a null respondent on analysis. According to the respondent on marketing forms of tiger nut, the nuts were sold in two forms which are the raw form or

processed form in our local market Based on percentage analysis, the raw form of tiger nut was sold up to about 60% and the processed form of tiger nut was sold in a percentage up to 40% in the local market where the study was conducted. it was made clear that 63.3% of the respondents source their capital personally through savings, followed by 23.3% of the respondents source their startup capital from relatives and friends to venture into tiger nut marketing, followed by a minimal amount of 13.3% source their basic startup capital from some microfinance banks as loans and finally, there was little or no tiger nut seller who got his or her startup capital from government grant in the study area.

Tigernut Production Process

Fig 1 shows the flow chart of tiger nut juice processing in the study area. Table 2 displays the production process of tigernut juice. The procedure for processing raw tigernut into milk juice as indicated by 100% of the respondents begins with the acquiring or purchasing of tigernut, is then soaked in water for ten minutes then washed into a container ready for grinding, is ground in a ratio of 3 litres of water per kilogram of tigernut, the ground mixture is then allowed to macerate for 10 minutes, at this point filter will be used to sift the juice from the shaft and then cinnamon and sugar can be added to taste, then serve preferably chilled.

Marketing channels of Tigernuts

Table 3 shows the marketing channels of tigernuts in the study area. According to the responses of the respondents (56.7%) are wholesalers in the channel of distribution, followed by (43.3%) who are retailers. According to the sampled respondents, (63.3%) get their tigernuts directly from the Producers while (36.7%) are from the wholesalers, indicating that the producers are the most dominant in the channel. Also, (53.3%) of the respondents sell their tigernuts to retailers while (46.7%) of the respondents sell directly to the consumers.

Costs and return of Tiger nut Marketing in Port Harcourt LGA

Table 4 shows the average cost and returns of tiger nut marketing in the study area. Table 4, showed that a total of One-Hundred and Forty-Seven thousand, Two-Hundred Naira (N147200) were incurred on purchasing raw tigernuts at an average of Four-Thousand, Nine-Hundred and Six Naira (N24906) per marketer. The table also showed that a total of Six-Hundred and Three-Thousand Naira (N603000) were realized as revenue from sales of tigernuts at an average of Twenty-Thousand, One-Hundred Naira (N20100) per marketer. The result also showed a Gross Margin of N389900 at an average of N12997 per marketer. The Marketing Efficiency of 2.829 is greater than one (1) hence indicating that tiger nut marketing in the study area is efficient, the rate of returns on investment of 0.65 also showed that tiger nut marketing is profitable in the study area

Constraints in Tigernut Marketing in the Study Area

Table 5 shows the constraints encountered in tigernut marketing in the study area. The problems faced by the tigernut processors and marketers in the study area were ranked as shown in table 5, it entails that 5 variables on the questionnaire were used to address the constraints. Items number 1, 2, 3, 5 6 and 7 were agreed with by the respondent (as they all had criterion mean scores greater than 2.50 while variable 4 was 2.23 (lower than the criterion)

Discussion

The Socioeconomic Characteristics of tigernut respondent's results showed that the majority (63.3%) were female. This implies that tigernut processing and marketing in the study area involves female youth participating more than males. This could be a result of the fact that women were more involved in tiger nut marketing and processing than males. The finding conformed to Okonta *et al.* (2021) who found out that the female gender was more into marketing than the males Also, Egbewore and Achoja (2013) affirmed that the marketing sectors are dominated by females. The age of the respondents indicated that the majority fell within the ages of 31-40 years (63.3%) This implied that the age of the respondents plays a critical role in tigernut marketing. The mean age was 29 years. This disagreed with Jatai and Shidiku (2012) who studied snail marketing and had a mean age of 39 years. Also, it disagreed with WHO (2018) stating that certain diet non-communicable diseases may be more associated or pronounced among this age group. The marital status of the respondents showed the majority were married (70%). This implied that married respondents who are committed to the business is a good development because the family members of the married will always assist with the income from tiger nut marketing. Their availability enhances the maximization of their full potential in marketing tigernuts. This study agreed with Oladejo (2019) that marketers are mostly married. For household sizes, the result further indicated that most of the respondents (63.3%) indicated that 6-10 persons are their household size. It has been observed that large family size may imply more marketing distribution channels hence reducing the cost of employment. This disagreed with Okonta *et al.* (2021) who observed that a larger percentage of the household size is between 4-6 persons. Those involved in tiger nut marketing have enough experience with the challenges encountered in marketing distribution in the study area. The majority of the marketers had an experience of 6-10 years (53.3%). This is an indication that the second range of persons has more experience than other of the respondents in the study area. This is also in consonance with the findings of Ogunniyi (2009) who reported an average of 9 years of marketing experience in snail marketing. According to the respondents on marketing forms of tiger nut, most of the tigernuts were sold in raw form 60%. This implied that consumers preferred raw tigernuts to processed tigernuts as a result of their health benefits (Pravst *et al.*, 2010; Mason, 2005). According to their responses from the respondents on their source of income, it was made

clear that the majority (63.3%) of the respondents source their capital personally through savings. Furthermore, the result from the processing method showed that there is a singular and dominant method of processing tigernut within Port Harcourt LGA (Adejuyitan, 2011). According to the responses of the respondents' majority (56.7%) were wholesalers in the channel of distribution while (63.3%) get their tigernuts directly from the Producers indicating that the producers are the most dominant in the channel of marketing. Also, most (53.3%) of the respondents sell their tiger nut to the retailers. This implied that most of the consumers in the study area get their tiger nut directly from the wholesalers for one reason or the other. These findings conformed to Aderounmu *et al.* (2019) that most of the utilized channel of marketing is usually from the marketers to the final consumer. The results from sources of finance showed that tigernut marketers source for funds majorly through personal savings. This result disagreed with Aderounmu *et al.* (2019) who found that access to finance through cooperative membership helps to boost marketing. The problems faced by the tigernut processors and marketers in the study area were ranked as shown in Table 5, all the constraints were agreed with by the respondent (as they all had criterion mean scores greater than 2.50 except for the storage facility was not a serious constraint for most of the respondent in the marketing and processing of tigernut.. It is evident that many developing countries lack good roads. Hence, these findings agreed with those of Okonta *et al.* (2021) which opined that multiple taxation, transportation problems and the lack of finance, were the major constraints to expanding the scale of their business. Consequently, some of the major constraints of tigernut marketing and processing are the lack of adequate transport services which is mainly caused by poor access to roads, processing equipment, branding and advertising, and a lack of facilities for the preservation of the processed products.

Conclusion

Tigernut processing and marketing is a lucrative and profitable business in Port Harcourt local government because for every N1 invested N0.65kobo was gained by the respondents in the study area, with minimal risk, therefore more people should be encouraged to take up the business, as it will aid to avert some socio-economic plight in our society. It is a good business opportunity which enables the creation of employment for those involved in the tigernut processing and marketing value chain. More storage/transport facilities as well as inputs should be provided at reduced cost to combat marketing challenges.

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Table 1 Socioeconomic Characteristics of the Respondents

Variables	Category	Frequency	Percentage(%)	Mean
Gender	Male	11	36.7	
	Female	19	63.3	
	Total	30	100	
Age	<20	-	-	
	21 – 30yrs	5	16.7	
	31 – 40yrs	19	63.3	29yrs
	>40	7	23.3	
	Total	30	100	
Marital status	Single	9	30	
	Married	21	70	
	Widow/Widower	-	-	
	Divorced	-	-	
	Total	30	100	
Household Size	1-5	11	36.7	
	6-10	19	63.3	8persons
	11-15	-	-	
	Total	30	100	
Marketing experience	1-5	14	46.7	
	6-10	16	53.3	8yrs
	11-15	-	-	
	Total	30	100	
What form do you sell your tiger nut?	Raw	18	60	
	Processed	12	40	
	Total	30	100	
Source of finance	Personal savings	19	63.3	
	Relatives/friends	7	23.3	
	Borrowed/ loan	4	13.3	
	Government grant	-	-	
	Total	30	100	

Source: Field survey, 2022

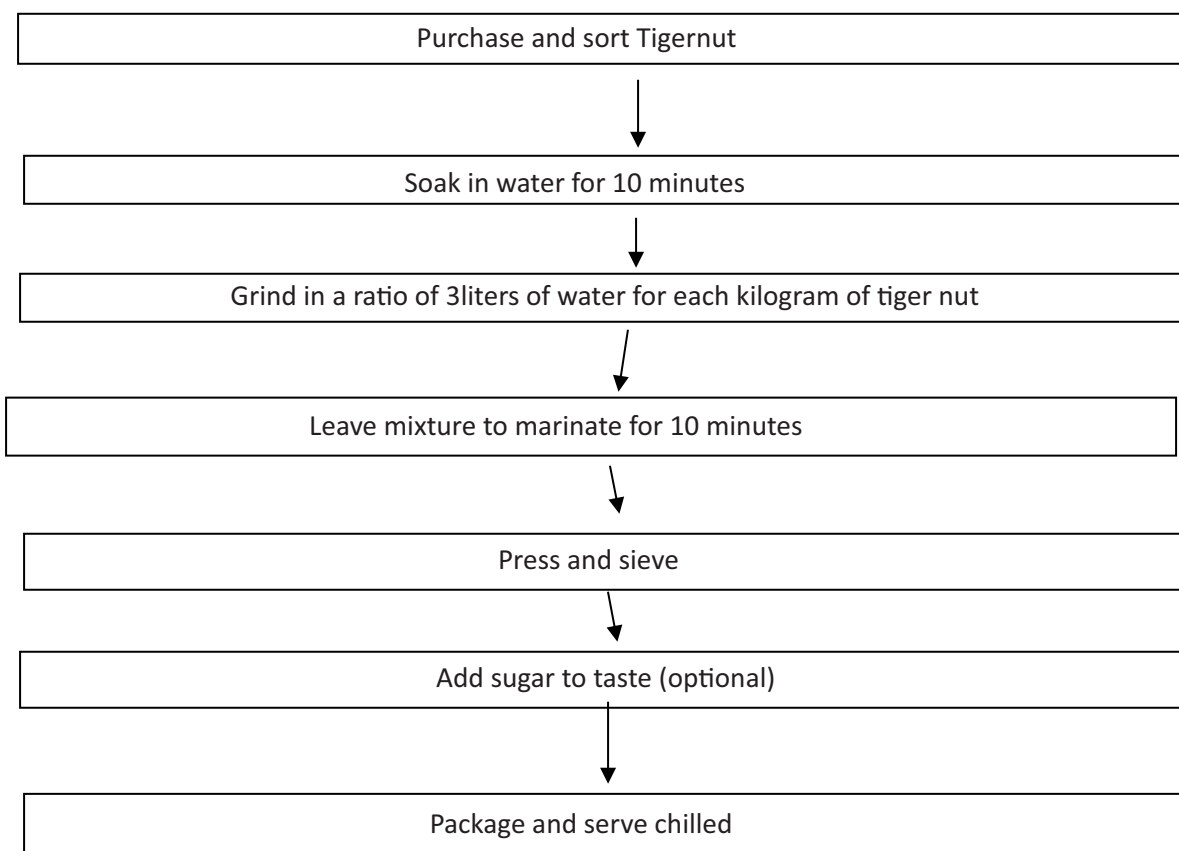


Fig 1: Flow chart of the Production process of tigernut juice

Table 2: Frequency Distribution according to method of processing (n=30)

Method of tiger nut processing	Frequency	Percentage (%)
	30	100

Table 3: Marketing channels of Tigernuts

Channels	Frequency (n=30)	Percentage (%)
Indicate your position in the channel		
Producer	-	-
Wholesaler	17	56.7
Retailer	13	43.3
Total	30	100
Whom do you get tiger nut from		
Producer	19	63.3
Wholesaler	11	36.3
Total	30	100
Who do you sell your tiger nut to		
Retailer	16	53.3
Consumer	14	46.7
Total	30	100

Source: Field survey, 2022

Table 4: Summary of Cost and Returns of Tiger Nut Marketing in Port Harcourt Local Government Area (n=30)

Cost components	Total (₦)	Average(₦)
Cost of raw tiger nut	147200	4906.7
Processing cost	17400	580
Transport cost	16600	535.3
Offloading	4100	136.7
Loading	4100	136.7
Association dues	10000	333.3
Tax	11500	383.3
Packaging cost	2200	73.3
TVC	213100	7103
TR	603000	20100
GM(TR – TVC)	389900	12887
ME(TR/TVC)	2.829	2.829
ROI (PROFIT/TR)	0.65	0.65

Source: Field survey, 2022

Table 5: Constraints encountered in Tigernut marketing (n=30)

Variables	Mean	Result	Remark
Multiple taxation	3.39	>	Agreed
Transportation problem	2.63	>	Agreed
Lack of finance	2.75	>	Agreed
Storage problem	2.23	<	Disagreed
Lack of processing equipment	3.40	>	Agreed
Lack of branding and advertising	3.50	>	Agreed
Lack of preservation facilities	3.45	>	Agreed

Criterion mean **50**

Source: Computed from Field Survey Data, 2022