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Consumer Attitudes and Perception on Plantain Flour

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Abstract

Value addition is needed to reduce associated glut from high post-harvest losses observed during Plantain peak production season. Evaluation of consumers' opinion is essential for better understanding of the commodity marketing processes. The study examined plantain flour consumers' attitudes, willingness to consume and perception. Data was collected from randomly sampled 97 consumers using semi structured questionnaires and analyzed with descriptive statistics and probit regression. From the findings, most respondents were aware (92.78%) and willing to consume plantain flour (86.96%); they were also aware of its health benefits (81.44%). However, processed plantain product ranked low (69.07%) when compared with other processed common staples such as yam flour (96.91%), semovita (88.66%), among others. Respondents agreed that plantain flour supports health and is more nutritious than yam flour ($\bar{X} = 4.16$) and is good for only adult of over 60 years of age ($\bar{X} = 4.12$). Awareness of its health benefits is a major factor that influenced willingness to consume plantain flour among respondents ($p < 0.05$). The study therefore recommends advocacy to promote inherent benefits of plantain flour as a staple food and as a means of reducing post-harvest losses experienced during the peak season of production.

Keywords: Plantain flour, Flour-based products, Consumers' perception, Marketing process.

Introduction

Plantain is a strategic crop for food security (Adejoro *et al.*, 2010); poverty reduction and source of income for rural populations (Frison and Sharrock, 1999) as well as overall economic development (Adeoye and Oni, 2013). Plantain (*Musa paradisiaca*) is a widely grown crop in Central and Western Africa (Onuoha *et al.*, 2014); Nigeria is the first plantain producing country in Africa and the fifth in the world (FAO, 2012). According to FAO, (2011), production of plantain in Nigeria in 2011 was about 2,727, 000 metric tons. Average consumption of plantain per person per year is 190kg (FAO, 2011). According to Nelson *et al.* (2006) and Phillip *et al.*, (2009), Plantain is the fourth most important food crop in the world after rice, wheat and maize and they can be used as food, beverages, medicines and fermentable sugars.

Plantain may be processed to a number of products such as flour, Dodo, baby food amongst others (Akinwunmi., 1999). According to Oyebade *et al.* (2013), plantain flour is a functional food. A functional food is part of a standard diet and it is consumed on a regular basis, in normal quantities (Doyon and Labrecque., 2008).

Postharvest loss of plantain is one of the major threats to the availability of the fruit that is a staple to many Nigerians (Wills *et al.*, 1989). It has been reported by Jones *et al.* (2013) that fresh bananas and plantain have a short shelf life and rough handling, unprotected storage

conditions and poor transportation could lead to post production losses of 30-40%. These losses have been attributed to inadequate storage facilities and inappropriate food processing technologies (Adetuyi *et al.*, 2012). Ladapo and Oladele (2011) opined that post-harvest losses serve as a major constraint in plantain production.

There have been several studies carried out on plantain in Nigeria such as Abiodun-Solanke and Falade (2010) which carried out a review of the uses and methods of processing banana and plantain into storable food products. There have been other studies in the field of nutrition and dietetics (Honfo, *et al.*, 2011; Abioye *et al.*, 2011; Onuoha *et al.*, 2014; Ibeanu *et al.*, 2016); policy analysis and competitiveness (Adeoye and Oni, 2013) while Oyebade *et al.* (2013) examined Youth awareness and consumption of Plantain flour.

Although value addition to plantains will increase the income of plantain farmers, evaluating consumer perceptions and attitudes are critical to the success of value chain development. Thus the relevance of this study in assessing the attitudes and perception as well as factors influencing plantain flour consumers is imperative.

Materials and method

The study area is Ido, one of the 33 Local Government areas of Oyo State, Nigeria, with its head-quarter in the town of Ido. It has an area of 986 km² and a population of 103,261 at the 2006 census. The Local Government was carved out of the former Akinyele Local Government. It shares boundaries with Oluyole, Ibarapa East, Akinyele, Ibadan South-West and Ibadan North-West Local Governments of Oyo State and Odeda Local Government of Ogun State. On the account of extensive fertile soil, which is suitable for agriculture, the basic occupation of the people is farming. There are large hectares of grassland which are suitable for animal rearing, vast forest reserves and rivers. People in the area grow varieties of cash crops such as cocoa, kola nut, palm oil, timber and food crops such as plantain, maize and rice (Wikipedia, 2015).

Ninety-seven respondents were randomly sampled within the Local Government Area, they fall into different occupational categories ranging from students to artisans, civil servants, teachers and traders.

Data Analysis

Descriptive statistics including frequency, percentage, mean and standard deviation were used to assess the attitudes and perception of consumers to plantain flour consumption. On the other hand, the probit regression model was used to examine the factors influencing the willingness to consume plantain flour by selected respondents within the study area. The functional form of the probit regression model used is as follows:

$$Y = \beta_0 + \beta_i X_i + \epsilon_i$$

Where Y= willingness to consume plantain flour (1= willing to consume, 0 otherwise)

X_i are independent variables which include:

X₁= age of respondent

X₂= sex of respondent (1= male, 0 otherwise)

X₃=educational status (1= tertiary education, 0 otherwise)

X_4 =Food expenditure (in Naira)

X_5 =Marital status (1= married, 0 otherwise)

X_6 = Awareness of health benefits of plantain flour (1=Yes, 0 otherwise)

e_i = error term

Results and Discussion

The results on Table 1 showed that average age of the respondents was 31.54 ± 8.37 years (32 years); this is supported by the findings on frequency of age groupings which showed that most of the respondents were aged between 21-40 years (77.32%). This shows that most of the respondents are young and active and may be interested in new and healthy product. There were more female respondents (51.55%) than male respondents (48.45%) involved in the survey. Most of the respondents (61.86%) were married; 37.11% were single; 73.19% had one form of tertiary education or the other (comprising Ordinary National Diploma, National Certificate of Education, Higher National Diploma, Bachelor of Science, Master of Science). A larger percentage of the respondents (47.19%) had monthly income between ₦10,000- ₦49,000 with average food expenditure of $\text{₦}18,464.84 \pm \text{₦}11,600.40$ and most of them (41.76%) having food expenditure value ranging from between ₦10,000-₦19,000.

Awareness and willingness to consume Plantain flour

The results (Table 2) revealed that most of the respondents were aware of plantain flour (92.78%) and were willing to consume it (86.96%). Most of them (81.44%) were aware of the health benefits of plantain flour. Specifically, they were aware that some health benefits could be derived from plantain flour consumption. The level of awareness of the flour is an indication that there is potential market for the product. Processing the product will go a long way in reducing post-harvest losses experienced most especially during the peak season of the production of the commodity. Additionally, the processed product may be exported out of the country thereby constituting a means of foreign exchange.

Consumption of Plantain flour and related processed products

Related processed products to plantain flour in the study area are Yam flour, Semovita, Cassava flakes and Wheat flour. A profile of the consumption of Plantain flour and related processed products (Table 3) revealed that yam flour (amala) was the most consumed processed product (96.91%) followed by semovita/semolina (88.66%), cassava flakes (garri) (86.60%) and wheat (83.51%). Plantain flour (69.07%) is the fifth most consumed flour-based processed product while cassava flour (61.86%) is the least consumed product among the sampled respondents. This implies that the consumption of plantain flour does not correspond to its awareness and willingness to consume. The finding on Plantain flour being the fifth most consumed flour-based product after yam flour, cassava flakes (“garri”) is similar to that observed by Oyebade *et al.* (2013) on plantain flour among university students in Ibadan. The study revealed that plantain ranked low when compared with yam flour and cassava flakes which was traceable to the fact that students associate plantain flour with the sick and elderly and observed that yam flour and cassava flakes were less expensive for them to purchase.

Table 1: Socio-economic characteristics and awareness of Plantain flour

Characteristics			
	Frequency (Percentage)	Mean	Standard deviation
Age (in years)			
<=20	8(8.25)	31.54	8.37
21-40	75(77.32)		
41-60	13(13.40)		
>60	1(1.03)		
Sex			
Male	47(48.45)		
Female	50(51.55)		
Educational status			
Primary	3(3.10)		
Secondary school	22(22.68)		
NCE/OND	26(26.80)		
HND/BSc/MSc	45(46.39)		
No education	1(1.03)		
Marital Status			
Single	36(37.11)		
Married	60(61.86)		
Widowed	1(1.03)		
Monthly income (n=89)			
<₦10,000	13(14.61)	₦44,188.76	₦40,842.08
₦10,000-₦49,000	42(47.19)		
₦50,000-₦99,000	26(29.21)		
Greater than ₦99,000	8(8.99)		
Food expenditure (n=91)			
Less than ₦10,000		14(15.38)	₦11,600.40
₦10,000-₦19,000	38(41.76)		
₦20,000-₦29,000	21(23.08)		
₦30,000-₦39,000	10(10.99)		
₦40,000-₦49,000	3(3.30)		
Greater than ₦49,000	5(5.49)		

Source: Field Survey, (2016)

Table 2: Awareness and Willingness to consume Plantain flour

Variables	Frequency	Percentage
<i>Aware of plantain flour</i>		
Yes	90	92.78
No	7	7.22
<i>Willing to consume</i>		
Yes	80	86.96
No	12	13.04
<i>Awareness of health benefits of plantain flour</i>		
Yes	79	81.44
No	18	18.56

Source: Field Survey, (2016)

Table 3: Consumption Plantain flour and related processed products

Variables	Frequency	Percentage
Yam flour	94	96.91
Cassava flour	60	61.86
Plantain flour	67	69.07
Wheat	81	83.51
Semovita / semolina	86	88.66
Cassava flakes	84	86.60

Source: Field Survey, (2016) (multiple responses)

Awareness of plantain products

Plantain products commonly found in Nigeria include: boiled, fried and roasted plantains. Plantains are also processed into chips which are prepared by frying thin slices of plantain in oil. Plantains are also made into flour-dried plantain pulp ground into powder (Onuoha *et al.*, 2014). Another plantain product commonly consumed in Nigeria is “dodo ikire” (peppered fried granulated plantain) (Abioye *et al.*, 2011). Abiodun-Solanke and Falade (2010) also noted that plantains can also be processed into flour and powder, canned slices, chips, Respondents were aware of some forms/products made from raw plantain (Table 4). Plantain chips (68.04%) had the highest popularity ranking among the respondents followed by plantain flour (62.89%), fried plantain (21.65%), roasted plantain (19.59%), peppered fried granulated plantain “dodo ikire” (12.37%). In addition, 2.06% of the respondents were aware of plantain cake while 2.06% of them were aware of soyamusa (baby weaning food made from plantain and soyabeans), wine made from plantain and plantain porridge as plantain products respectively.

Table 4: Awareness of plantain forms/products

Variables	Frequency	Percentage
Plantain flour	61	62.89
Fried plantain	21	21.65
Peppered fried granulated plantain	12	12.37
Plantain chips	66	68.04
Soyamusa*	2	2.06
Roasted plantain	19	19.59
Wine from plantain	2	2.06
Plantain porridge	2	2.06
Plantain cake	3	3.09

Source: Field Survey, (2016) *Soyasmusa is a processed food from plantain and soyabeans usually fed to babies.

Consumer perception of Plantain flour

The Consumers' opinion on plantain flour was assessed using a five point likert scale. Mean score obtained for most of the questions were above the critical value (3.00) which implies that the respondents agree with the statements made. Most of the respondents opined that plantain flour supports health and is more nutritious than yam flour ($\bar{X} = 4.16$), it is only good for adults of over 60 years of age ($\bar{X} = 4.12$), its dough is similar in taste to yam flour ($\bar{X} = 4.02$) and adding value to plantain by processing increases income ($\bar{X} = 4.01$) (Table 5). Respondents also agreed that colour of plantain flour is more attractive than yam flour ($\bar{X} = 3.73$), plantain flour is readily available in the respondents' area ($\bar{X} = 3.52$), more expensive than yam flour ($\bar{X} = 3.49$) and processing plantain into flour reduces post-harvest losses during glut ($\bar{X} = 3.16$). The respondents disagreed that plantain flour is cheaper than yam flour ($\bar{X} = 2.75$). Succinctly, apart from the age long belief that plantain flour is only for the adult, the study revealed that respondents agreed that processing plantain could reduce post-harvest losses and lead to improvement in income. They also agreed that the dough of plantain flour was similar in taste to yam flour, it is therefore valid to infer that plantain flour was an acceptable staple food in the study area.

Table 5: Consumer's perception of Plantain flour

Perception statement	Mean score	Decision
Plantain flour dough is similar in taste to yam flour	4.02	Agree
Plantain flour supports health and is more nutritious than yam flour	4.16	Agree
Plantain flour is not only for Diabetic patients	3.04	Agree
Plantain flour is readily available in my area	3.52	Agree
Plantain flour is more expensive than yam flour	3.49	Agree
The colour of plantain flour is more attractive than yam flour	3.73	Agree
Yam flour is cheaper than plantain flour	2.47	Disagree
Plantain flour is cheaper than yam flour	2.75	Disagree
Plantain flour is good for only adults of over 60 years of age	4.12	Agree
Processing plantain into flour reduces post-harvest losses during glut	3.16	Agree
Adding value to plantain by processing increases income	4.01	Agree

Scores; 1=strongly disagree, 2= disagree, 3=undecided, 4=agree, 5=strongly agree. Mean score= 15/5=3.0.

Factors influencing the willingness to consume Plantain flour

A probit regression was carried out to examine the factors influencing willingness of respondents to consume plantain flour. The results revealed that awareness of its health benefits influenced respondents' willingness to consume (Table 6). Thus, awareness of the health benefits of plantain

flour increases the likelihood of respondents willingness to consume it by 57.87% ($p < 0.05$). The result implies that the awareness of health benefits of plantain flour has a positive influence on willingness of respondents to consume it. This could be due to the fact that respondents are willing to consume plantain flour for preventive and curative purposes.

Table 6: Factors influencing willingness to consume Plantain flour

Variables	Coefficient	Standard error	Marginal effect	z-value
Age	0.0233	0.0068	0.0051	0.74
Sex	0.6625	0.0970	0.1446	0.49
Food expenditure	0.000	0.0000	5.88X10 ⁻⁶	1.22
Marital status	0.1683	0.0958	0.0366	0.38
Awareness of health benefits	1.7120	0.2603	0.5787**	2.22
Constant	-2.1380	-	-	
Log-likelihood	-25.1379			
Pro>chi ²	0.1742			
Pseudo R ²	0.1326			
Number of observations	62			

Conclusion

The attitude of people, awareness and their willingness to consume plantain flour is relevant for the development of the plantain value chain and the benefits derived from the consumption of the processed product. Findings revealed that most of the consumers were aware about the product. The study showed that the major reasons for being willing to consume the product is an awareness of health benefits accrued to its consumption. In other words, respondents should be increased enlightenment on the awareness of health benefits from consuming plantain flour so as to increase the willingness of respondents in the study area to consume the product.

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