

DETERMINANTS OF CONSUMERS' PREFERENCE FOR ABAKILIKI RICE IN ABA SOUTH LOCAL GOVERNMENT AREA OF ABIA STATE, NIGERIA

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ABSTRACT

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The Nigeria populace demand for rice has increased over the past decade giving rise to importation of rice to meet the huge demand for rice in the country. This is because most of the local rice produced cannot meet the high demand for rice in Nigeria. This study therefore sought to examine the determinants of consumers' preference for Abakiliki rice (local rice) in Aba south Local Government Area. Multi-stage sampling was adopted in the selection of 100 consumers of Abakiliki rice from 10 villages in the study area. Data was collected through the use of structured questionnaire and face-to-face interview method. The data collected were analysed using descriptive statistics such as frequency counts and percentages, logit regression, contingent valuation and Kendall's Coefficient of Concordance. The result of the study showed that majority (74%) of the consumers were females and majority (83%) are within the age bracket of 20-50 years old. Also, majority (74%) of the respondents' monthly income was within the range of ₦40, 000 to ₦100, 000 while 54% spent between ₦ 6,000 - ₦ 10,000 on Abakiliki rice monthly. The result shows a pseudo R² of 0.602 which implied that about 60.20 percent of the variation in the consumer's preference for Abakiliki rice was explain jointly by the explanatory variables in the model. Gender was found to be significant at 1% level while Age, Household size and marital status were significant at 5% level. The result showed majority (66.7%) of the respondents who earn ₦100, 000 - ₦150, 000 are willing to pay ₦50 per cup for Abakiliki rice. While, 53.3% of the respondents who earn below ₦40, 000 are willing to pay ₦6.000 per bag. The results of the ranking showed that non-attractiveness of Abakiliki rice was ranked as most the influential constraints inhibiting consumer's preference for Abakiliki rice with the mean rank of 1.63. The Kendall's coefficient of concordance obtained in the analysis was 0.28 and was significant at 1% level suggesting that 28% of the respondents agreed on the outcome of the rankings. The study recommended that further improvement as regards the quality and production of Abakiliki rice is needed to encourage more consumers in consuming it amongst others.

Keywords: *Abakiliki rice, Consumers preference, logistic regression, willingness to pay*

INTRODUCTION

In order to increase the supply of rice in Nigeria, successive government intervention in the rice sector by increasing tariffs so as to encourage the production of local rice in the country has been going on over the past few decades. In 1974 the government established the National Cereal Research Institute. The National Seed Service in association with the Food and Agriculture Organization in 1975, and Operation Feed the Nation in 1976 were also established by the government. These and many more government programmes were carried out over the past few decades mostly aimed on increased rice (amongst other crops) production processing and export, in other to address the demand for rice and the supply of rice amongst other crops and stimulate surplus rice harvest for export in the country. Despite the efforts made by the Nigerian government to increase the production of local rice such as Abakiliki rice, Ofada rice, Gboko rice, Mokwa rice amongst others, through the establishment of several programs, importation of rice continues unrestricted (Okoruwa, *et al.*, 2006; Rahji, *et al.*, 2008). Nigeria is the largest importer of rice in Africa, and the second largest importer in the world, while Nigeria ranked the highest producer and consumer of rice in West African sub region. Rice consumption in Nigeria has risen tremendously at about 10% per annum due to the changing preferences (Sowunmi, *et al.*, 2014). Also due to the fact that local rice production has never been able to meet the demand for rice by the increasing population which has led to considerable imports as Nigeria spends over two billion US dollars on rice importation between January 2012 and May 2015. (CBN, 2015).

The high demand for imported rice over the years could also be as a result of an average Nigerian consumers' desire for white polished rice in the country. According to United State Agency for International Development (2009), the switch of urban consumption from coarse local rice to imported rice can be explained by consumers' perception that local rice is of inferior quality. This is because of a large percentage of foreign matter and low levels of post-harvest grading and sorting as the Nigerian local rice fails to meet expectations concerning reduced workload and time spent on sorting and cooking rice, and hence falls short relative to imported rice. This is why imported rice is preferred in Nigeria to local domestic rice. There is an expected increase in the production of local rice due to the current intervention of the government and the need for sustainable production is based on the possible increase in demand for local rice by most consumers whose preference for rice imported from USA, China, Thailand, and India is very high. Therefore there is a need for a research and analytical study on the future increase in the demand for local rice by estimating the proportion of consumers that have preference for Abakiliki

rice as well as taking into consideration the reasons why some consumers prefer foreign rice to Abakiliki rice and implement such reasons at the appropriate point along the value chain of Abakiliki rice in order to raise consumers preference for higher quality product as limited domestic processing capacity creates demand for imports.

In general, quality attributes of rice products is largely determined by individual preferences. Rhor, *et al.* (2005) supported the idea that food quality attributes are heterogeneous terms and consumers' definitions of food quality are formed by individual preferences. Consumers mostly consider and evaluate a range of quality attributes in the rice they purchase. These attributes will contribute, in differing proportions, to the overall level of satisfaction derived from purchasing or consuming the product. It is against this backdrop that this study was carried out with the following objectives: to describe the socioeconomic characteristics of Abakiliki rice consumers, analyze the determinants of consumer preference for Abakiliki rice, determine the premium consumers are willing to pay for Abakiliki rice in relation to their monthly income. And identify the constraints to Abakiliki rice consumption in Aba South Local Government

MATERIALS AND METHODS

Description of the study area

The study was carried out in Aba South local Government Area (LGA) of Abia State. Aba south LGA had a projected population of 489,199 persons as at 2011 (NBS, 2012). Aba South LGA is one of the 17 Local Government Areas in Abia State, Nigeria. Abia State is about 5,834 square kilometers, is bounded on the north and northeast by the states of Anambra, Enugu, and Ebonyi. To the west of Abia is Imo State, to the east and southeast are Cross River State and Akwa Ibom State, and to the south is Rivers State, the southern part of the State lies within the riverine part of Nigeria. It is low lying tropical rain forest with some oil palm brush. The southern portion gets heavy rainfall of about 2400 millimeters per year especially intense between the months of April through October. The rest of the State is moderately high plain and wooded savanna. Abia people are of the Igbo ethnic group who are one of the indigenous people of southeastern part of Nigeria. Aba south LGA is known for the consumption of local rice called Abakiliki rice by most of the indigenes. The population of the study comprised of all rice consumers in Aba South Local Government Area of Abia State

Data collection

The study employed the snowball sampling method in the first case to compile a list of consumers of Abakiliki rice in the study area from selected 10 villages (Abaukwu, Akoli, Umuosi, Ohabiam, Nnetu, Iheorji, Asaeme Eziukwu Ndiegoro and Obudu) in Aba South Local Government Area of Abia State. Secondly 100 respondents were selected using simple random sampling technique. Survey research design was adopted for data collection through the face-to-face interview method which was employed by the use of questionnaire to obtain relevant information from the sampled respondents. This provided the opportunity to give explanation to questions which are difficult to answer, to obtain the accurate information required for the study, and also to afford the researchers the opportunity to educate the respondents.

Method of data analysis

Descriptive statistics such as frequency counts and percentages, Logit Regression, Contingent Valuation and Kendall's Coefficient of Concordance were used to analysis the data collected.

Logistic model

Logistic model was employed to analyze the determinants of consumer preference for local rice in Aba South Local Government Area. The binary response in the study was whether the respondent prefers local rice ("Success") or does not prefer local rice ("Failure").

If Y is a random variable (dichotomous), it can then be assumed that Y takes the value of 0 or 1, where 0 denotes the non-occurrence of the event in question and 1 denotes the occurrence. X_1, \dots, X_p are the characteristics to be related to occurrence of this outcome, and the logistic model specifies that the conditional probability of event (i.e., that $Y=1$) gives the values X_1, \dots, X_n as follows

$$P_1(y_i = \frac{1}{X_i \beta_i}) = 1 - \frac{e^{-x \beta}}{1 + e^{x \beta}} \quad (1)$$

$$= \frac{e^{x \beta}}{(1 + e^{x \beta})} \quad (2)$$

$$y_i = 1 - f(x_i \beta) + u_i \quad (2)$$

Where

y_i = the dependent variables denoting a consumer's demand for local rice

x_i = a vector of factors influencing a consumer's preference for local rice

u_i = the residue representing the deviation of the binary from its conditional mean.

The empirical model specified to analyze the consumer preference for local rice was adopted from Gideon *et al.* (2014) and specified as:

$$\log\left(\frac{P_i}{1-P_i}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \epsilon \quad (3)$$

Where

P_i = the probability of a respondent's preference for local rice

$$\frac{P_i}{1-P_i} = \text{the odd ratio in favour of a respondents preference for local rice.} \quad (4)$$

$X_1 \dots \dots X_{10}$ = the socio economic characteristics namely:

X_1 = Gender (categorical: Female=1, Male= 0)

X_2 =Age (continuous measure- years)

X_3 = marital status (Categorical: Married = 1, Not married =0)

X_4 = Educational background Formal education = 1, No formal education =0)

X_5 = Household size (continuous measure- Persons)

X_6 = Monthly income (Naira)

X_7 = share of monthly income on Abakiliki rice (Naira)

X_8 = Frequency of consumption (Once a week =0, 2-4 times a week =1, 5-7 times a week=3)

ϵ = the error term.

β_i = The logistic coefficient for the independent variable

Kendall's Coefficient of Concordance

The Kendall's coefficient of concordance was employed to rank some of the constraints that may inhibit consumer's preference for Abakiliki rice. The Kendall's (W) is a measure of the agreements among several judges (respondents) who are assessing a given set of n objectives (constraints) (Legendre, 2005). Where W is an index that measures the ratio of the observed variance of the sum of ranks to the maximum possible variance of the ranks. The idea behind this index is to find the sum of the ranks for each constraints been ranked. If the ranking are in perfect agreement, the variability among this sum was maximum (Mattson, 1986). According to Legendre (2005), the Kendall's coefficient of concordance (W) is given by the formula:

$$W = \frac{12S}{p^2(n^3-n)} - p^T \quad (5)$$

Where

W = the Kendall's coefficient of concordance.

P = number of respondents ranking the constraints.

n = the number of constraints.

T = the correction factor for tied ranks.

S = the sum of squares statistics over the row sum of ranks (R_i). The sum of square statistics (S) is given as:

$$S = \sum_{i=1}^r (R_i - R)^2 \quad (6)$$

Where:

R_i = the row sums of rank.

R = the mean of R_i

The correction factor for tied ranks (T) is also given as:

$$T = \sum_{k=1}^m (t_k^3 - t_k)$$

Where:

t^3 = the number of ranks in each (k) of m group of ties

The test of significance of the Kendall's coefficient of concordance was done using the chi-square statistics which is computed using the formula:

$$X^2 = P / (n-1) W \quad (7)$$

Where

n = the number of constraints.

P = the number of respondents and W is Kendall's coefficient of concordance.

The decision rule is that if the calculated chi-square is greater than the chi-square critical, then the null hypothesis is rejected in favour of the alternative hypothesis that there is agreement among the ranking of the constraints by the respondents.

Contingent Valuation

Contingent Valuation is a form of stated preference which could be Open ended or a Dichotomous choice model. The objective of contingent valuation methods is to provide the researcher with monetary valuations of the target goods. Open-ended Contingent Valuation (CV) is a direct method asking the respondents to state their maximum willingness to pay or minimum willingness to accept for a change in their utility compared to the status quo situation (Hanley, *et al.*, 2001). In Dichotomous-choice contingent valuation the respondents are instead asked to choose whether they will accept or reject a fixed price for a certain product (MacKerron, *et al.*, 2009).

RESULTS AND DISCUSSION

Socioeconomic characteristics of Abakiliki rice consumers

The socioeconomic characteristics of the respondents are presented in Table 1. The result indicated that majority (74.0%) of the respondents are females while the males constituted 26.0%. This finding is consistent with the assertion that women contribute immensely to the development of the family and are majorly the household

decision makers with regards to household food consumption. This result is in agreement with the finding of Diako, *et al.* (2010) who reported that they were more (84.16%) females in a similar study carried out in Ghana. The result also show that most (44.0%) of the respondents were in the age bracket of 21-35 years followed by those within the age range of 36-50 years representing about 39.0%. Notwithstanding the mean age of the respondents was 40 years. This result shows that majority of the respondents were in their active age.

Table 1: Socioeconomic characteristics of Abakiliki rice consumers

Items	Frequency	Percentage	Mean
Gender			
Male	26	26.0	
Female	74	74.0	
Age			
21-35 years	44	44.0	
36-50 years	39	39.0	40 years
51-65 years	11	11.0	
66-70 years	6	6.0	
Marital Status			
Single	19	19.0	
Married	81	81.0	
Divorced	-	-	
Educational level			
No formal education	10	10.0	
Primary education	26	26.0	
Secondary education	44	44.0	
Tertiary education	20	20.0	
Household Size			
1-5 persons	61	61.0	
6-10 persons	37	37.0	5 persons
11-15 persons	-	-	
16-20 persons	2	2.0	
Monthly income			
₦10,000- ₦50,000	26	26.0	
₦ 51,000-₦90,000	74	74.0	₦62,900
₦ 91,000-₦140,000	3	3.0	
Monthly Expense on Abakiliki rice			
₦ 1,000- ₦ 5,000	37	37.0	
₦ 6,000- ₦ 10,000	54	54.0	₦6,750
₦ 11,000- ₦ 15,000	6	6.0	
₦ 16,000- ₦ 20,000	3	3.0	

Source: Survey Data, 2016.

This is in consonant with the finding of Galawat and Yabe (2010) who reported that majority of rice consumers were within the age range of 31-40 years old in their study. From the result 19.0% are single, 81.0% are married. This result shows that majority of the rice consumers and decision makers in Aba South Local Government Area were married. Policies geared towards increased rice production must factor in the marital status of the respondents. The result further shows that majority (61%) of the respondents have household size of 1-5 persons with a mean household size was 5 persons. This implied that the majority of the respondents have small household size. This result however is not in agreement with the findings of Bamidele, *et al.* (2010) who reported that majority of the rice consumers had a household size of 5-9 persons. The result shows that most (44.0%) of the consumers attained secondary education with about 26.0% of the respondents having primary education, while 20.0% of the respondents had tertiary education and only 10.0% of the respondents had no formal education. The large percentage of secondary educated respondents could partly be attributed to the fact that the study area had taken full advantage of basic system of education. This result agrees with the finding of Galawat and Yabe (2010) who also reported that most (43%) of the consumers of local rice in Brunei attained secondary education. The result also indicated that 52.0% of the respondents earn an average monthly income ranging from ₦ 51,000 - ₦ 90,000, while 42.0% of the respondents earn between ₦10, 000 - ₦50,000, and only 6.0% of the respondents earn an average monthly income ranging from ₦91, 000 - ₦ 140,000. The mean monthly income of the respondents was ₦62, 900. The results also revealed that about 61.0% of household had less than 5 people, 37.0% had 6-10 people while about 2.0% had more than 15 people. The large percentage of household size respondents could be partly attributed to the fact that most of the households are nucleated family and they understand family planning due to the rapid shift from rural to urban settlement in the area. The result revealed that 54.0% of the respondents spend ₦ 6,000 – ₦ 10,000 in purchasing Abakiliki rice for a month, 37.0% spend ₦ 1,000 – ₦ 5,000.

The mean expense on Abakiliki rice in the study area was ₦6750 per month. The large percentage of the monthly expense on Abakiliki rice by the different households may be largely influenced by the frequency of consumption (mostly 2-4 times a week) and their monthly income.

Determinants of consumer preference for Abakiliki rice

Logistic regression analysis was used to determine factors that influence consumer's preference for Abakiliki rice consumption in Aba South Local Government Area of Abia State. This was presented in Table 2. The marginal effect was used to describe the effects of the explanatory variables on consumer preference for Abakiliki rice. The pseudo R^2 was 0.602 which implied that about 60.20 percent of the variation in the consumer's preference for Abakiliki rice was explained jointly by the explanatory variables in the model. Gender was found to be significant at 1% level while Age, Household size and marital status were respectively significant at 5% level. These variables were found to have significant influence in explaining consumer's preference for Abakiliki rice in the study area.

Table 2: Estimated consumer preference for Abakiliki rice

Variable	Coefficient	t-value	P-value
Gender	2310	2.714	0.007***
Age	1.350	2.106	0.038**
Marital status	2.209	2.414	0.017**
Educational Level	0.299	0.657	0.512
Household size	2.106	1.983	0.050**
Monthly Income	0.623	0.922	0.358
Monthly Expense on Abakiliki rice	0.377	0.489	0.625
Frequency of consumption	0.159	0.220	0.826
Wald Chi ² (8)	11.304***		
Pseudo R ²	0.692		
Likelihood	58.821		

Source: Computer from field data.

*** and ** = 1% and 5% significant level respectively

Table 5: Abakiliki rice consumption inhibitors

Constraints	Mean Rank	Rank
Non-attractiveness	1.63	1 st
Texture	2.00	2 nd
Relative Price	3.70	3 rd
Poor packaging	3.86	4 th
Non-availability	4.72	5 th
Taste	5.09	6 th

Source: Field Survey, 2016

Kendall's W^a = 0.28

n = 100

The results indicated a significant and positive relationship between consumer preference for Abakiliki rice and gender. The results conform/agree to the proof that a decision on household food consumption is mostly done by female. The age of the respondents from the results was found to also have a positive relationship with consumer's preference for Abakiliki rice and it is statistically significant. This is in line with the *apriori* expectation because as the age of the respondents increases the preference for rice increase. From the regression result, household size is a significant factor that affects consumer preference for Abakiliki rice. Household size had a positive relationship with preference for Abakiliki rice and it was statistically significant at 5% level. Thus from the marginal effect, when consumers increase their household size, the probability of their family for Abakiliki rice increases by a factor of 2.106 units. Marital status also had a positive relationship with preference for Abakiliki rice and it was statistically significant. Thus this coincide with the assertion that married women are the major decision makers with regards to food consumption and an increase in the number of married people brings about an increase in consumers preference for Abakiliki rice by a factor of 2.209 units. The wald chi square test for the variables in the model was 11.304 and was significant at 1% level. This implies that the variables in the model contributed significantly to consumers' preference for Abakiliki rice.

Constraints to Abakiliki rice consumption

The results of the rankings are presented in Table 5. Non-attractiveness of Abakiliki rice was ranked by consumers as most influential constraints inhibiting consumers' preference for Abakiliki rice with the mean rank of 1.63. The next most influential inhibitor was texture followed by relative price with the mean rank of 2.00 and 3.70 respectively. The least influential factor among them was the taste of the Abakiliki rice as most respondents purchase Abakiliki rice due to its nutritional content and its delicious quality. The Kendall's coefficient of concordance obtained in the analysis was 0.28 and was significant at 1% level suggesting that 28% of the respondents agreed on the outcome of the rankings. This means that there is relative agreement between the respondents in relation to the ranked inhibitors of Abakiliki rice consumption.

Relative price was the third influential inhibitor because of the present increase in the price of Abakiliki rice from ₦35/cup to ₦100/cup. This has presently reduced the number of people who purchase Abakiliki rice as they can be able to also afford the improved domestic rice which is presently sold at ₦130/cup. Non attractiveness was ranked highest due to the unpolished nature of the rice unlike the foreign rice which is polished. Also the presence of foreign materials such as stones also contributes to the non-attractiveness of Abakiliki rice. Although there have been recent improvement in the processing of Abakiliki rice, as most of the rice are stone free and properly packaged by the most milling companies in Ebonyi State. This may be the reason why poor packaging was ranked

fourth (4th) by the respondents as against non-availability which is ranked fifth (5th). This result is similar to the findings of Diako *et al.* (2010) who reported similar constraints and ranking for rice consumers in their study.

CONCLUSION AND RECOMMENDATIONS

The study applied logistic regression which is used to ascertain consumer's preference as against several predictors. The key variables that significantly influence consumer's preference for Abakiliki rice were; age, marital status, gender, and household size. The empirical results revealed that consumers are willing to pay less than the present value of Abakiliki rice without considering the attributes of the rice and non-attractiveness of Abakiliki rice was ranked highest as the most influential factor inhibiting the purchase of Abakiliki rice in the study area. Therefore there is need for further improvement as regards the quality and production of Abakiliki rice. Generally, consumers make their choice on specific goods and services that will give them maximum level of utility. Since consumers are willing to pay less than the present value of Abakiliki rice, the government should subsidize the production on Abakiliki rice. This will reduce the price of rice and encourage farmers to produce more. Intensified campaign within the southern and eastern part of Nigeria should be encouraged in order to create more awareness on the benefits of Abakiliki rice despite the present attributes of the rice.

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