



DETERMINANTS OF CONSUMER PREFERENCE FOR RICE IN MAIDUGURI METROPOLITAN COUNCIL OF BORNO STATE, NIGERIA

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ABSTRACT

The study analysed the determinants of consumer preference for rice in Maiduguri Metropolis, Borno State, Nigeria. The specific objectives were to examine the socio-economic characteristics of rice consumers in the study area; identify and rank attributes that determine consumer preference for rice and examine the relationship between price and quality attributes of rice. A sample size of 125 was obtained using Khotari (2004) formula for estimating sample size. Both primary and secondary data were used for the study. The primary data were collected by use of structured questionnaires administered to respondents selected using a random sampling technique. The study used both descriptive and inferential statistics for data analysis. The findings of the descriptive statistics revealed that the respondents were mostly females within the age group of 31-40 years. Majority (68%) are married, educated and earning above the ₦18, 000 minimum wage as their monthly income. The result further indicates that price, cleanliness, taste, availability and source of origin were the most preferred rice quality attributes. The results of the hedonic price analysis revealed that taste, cohesion, cleanliness, grain size and swelling capacity showed a positive significant relationship with price. The study concludes that consumer preference for rice quality attributes was found to affect price both positively and negatively. Hence, the study recommends that all efforts to improve rice production in Nigeria must therefore aim to introduce these desirable attributes into breeding programmes so as to raise the demand for local rice, thereby helping the country achieve its rice self-sufficiency goal.

Keywords: Consumer, Preference, Hedonic analysis, Rice

INTRODUCTION

Consumer preference is a key ingredient that determines consumer's choice towards goods and services. Accurate information on consumer preference helps producers and marketers in providing the requisite demand of their customers. Globally, consumers are becoming more informed about various products attributes. Gurung (2013) affirms that Consumers around the world are becoming more aware of quality attributes of products and are choosing the commodity that best suits their preferences. This is true for rice as well. Rice is one of the most staple foods in Nigeria with consumption per capita of 32kg; statistics have shown that in the past decade rice consumption increased by 4.7% which is almost four times the global consumption growth and reached 6.4 million metric tons in 2017 accounting for about 20% of Africa's consumption (Chima, 2018). Nigeria in time past has been a major importer of rice in Africa. The country spends at least \$5million daily on rice importation from

Thailand alone, among other rice producing countries (Vanguard, 2017). These have adversely affected local production, foreign reserve and raises overall concern over food insecurity (Kuku-Shittu & Pradesha, 2015).

To overcome these problems, the Nigerian Government embarked on a plan to make the country self-sufficient in rice production. The rice sector has received special attention through introduction of various policies and strategies. At the national level, a total ban has been placed on importation of rice with the aim of increasing local production. Also, government's efforts in promoting production, growth and attaining self-sufficiency continue, extending assistance to producers through initiatives such as the Growth enhancement support scheme (GESS), the Anchor Borrowers Programme and the Presidential Initiative on fertilizer (FAO, 2017).

Notwithstanding the strides by Nigerian government towards attaining self-sufficiency in rice production, the country still depends on importation in order to bridge the supply-demand gap (USDA, 2018). The inability of Nigeria to supply enough rice to meet the national demand could be attributed to changing consumer preference especially for urban dwellers (Kuku-Shittu & Pradesha, 2015). Obih and Baiyegunhi (2017) in a study conducted in Nigeria discovered that most Nigerians prefer to consume imported rice, local rice has failed to compete with imports because consumers have become used to the grain and sensory qualities of imported rice. The characteristics that have endeared so many consumers to imported rice include cleanliness, swelling capacity, taste, grain-shape, non-brokenness and free from stone (Bamidele *et.al*, 2010). The major challenge now is to produce sufficient and affordable rice that suits the preference of the population (consumers). This is because, once consumers meet their preferences they would be ready to pay more. This premium will serve as insights to producers in improving those attributes desired by consumers.

Many factors could explain consumers' preference for rice whether imported or local (Danso- Abbeam, *et.al*, 2014). Most times, consumers give more attention to price and quality of commodity they buy (Diako *et.al*, 2010). According to Opeyemi *et.al*, & Ifabiyi, (2015), factors determining consumer preference for rice includes, quality, cost, availability, taste, and source of rice. Kassali *et.al*, (2010) found that socio-economic characteristics can also affect consumer preference for rice.

It is pertinent to note that quality attributes and price play dominant roles in determining consumer preferences. It is in view of this that this study will be conducted with the objective of analysing consumer preference for rice in Maiduguri Metropolis. Specifically the study; (i) examines the socio-economic characteristics of rice consumers, (ii) identify and rank the most important quality attributes that determine consumer preference for rice and (iii) examine the relationship between price and quality attributes of rice.

METHODOLOGY

This study was conducted in Maiduguri Metropolitan Area (MMC), Borno State, Nigeria. Maiduguri Metropolitan Area is situated within Maiduguri, the State Capital and lies within latitudes $11^{\circ}40'$ and $120^{\circ}5'N$ and longitudes $13^{\circ}50'$ and $122^{\circ}0'E$. The climate of the area is characterized by dry and hot seasons, minimum temperature ranging from $15-20^{\circ}C$, while the maximum temperature ranges from $37-45^{\circ}C$. It has a mean annual rainfall of about 625mm from May to September and a relative humidity of 35%. Maiduguri Metropolitan Area is the most populated Local Government Area in the State with an estimated population of 803, 000 people (United Nations Populations Projection, 2021). The dominant ethnic group of Maiduguri Metropolitan Area is Kanuri. Other ethnic groups include Shuwa Arab, Margi, Babur-bura, Mandara, and Hausa. People in Maiduguri Metropolitan Area are engaged in Various economic and agricultural activities ranging from urban pastoralism, local craft, food processing, vegetable production, poultry production, trading to tertiary activities such as

banking and consultancy as well as cultivation of grains such as maize, rice, wheat, millet, groundnut, cowpea, tomatoes, onions etc.

Both primary and secondary data were used for the study. Primary data were generated through the use of structured questionnaires. On the other hand, secondary information were obtained from various literature such as journals, theses and dissertations. The main instrument for data collection was a well-structured questionnaire. The questionnaire contained some important socioeconomic questions asking for respondents characteristics such as sex, age, marital status, household size, education level completed, primary occupation and monthly income. Consumers were asked to rank the different rice quality attributes and also rate on a scale of 1 to 5 on different rice attributes (with 1 being the abundance of the stated quality to 5 being the lowest). An important aspect of the survey was to ask the price rice consumers were paying at present.

Multi-stage sampling procedure was used to select the respondents for the study. In the first stage, 5 wards were purposively selected from the 15 wards of the Metropolis. In the second stage, 25 respondents were randomly selected from the five wards making a total of 125 respondents. The tools that were used to analyse the data were descriptive and inferential statistics. Descriptive statistics such as frequencies, percentages and means were used to describe the socioeconomic characteristics of rice consumers and to identify & rank the most important attributes that determine consumer preference for rice. They were specifically used to achieve objectives (i) and (ii). The hedonic regression model was then used to determine the price-quality attribute relationship of rice.

Identifying Rice Quality Attributes Preferred by Consumers

The attributes considered for evaluation in this research have been listed in Table 1. The identified preferences were ranked from the most important to the least important using numerals 1,2,...,9, in that order. Mean importance is calculated with the values of 1 being the most important and 9 least important. Hence, a lower mean indicate a greater importance.

Table 1: Quality Attributes Considered for the Study

Intrinsic Attributes	Extrinsic Attributes
Taste	Cleanliness
Cohesion	Source of rice
Aroma	Availability
Swelling capacity	Grain size
	Price

Source: Author’s Illustration

The Empirical Hedonic Price Model for Rice

Assumptions regarding consumer’s preference for rice attributes based on Griliches (1961) model of quality change were made. It was assumed that there is a functional relationship between the goods price and its quality attributes in the form of $P_r = f(x)$ where p_r is the market price and x represents its attributes.

The hedonic regression model is expressed as:

$$P_r = \alpha + \beta x_{1r} + \beta x_{2r} + \beta x_{3r} + \beta x_{4r} + \beta x_{5r} + \beta x_{6r} + \beta x_{7r} + \beta x_{8r} + e \dots\dots\dots 1$$

Where p_r is designated as the dependent variable, with $x_{1r}, x_{2r}, \dots, x_{8r}$ are the independents variables.

Thus:

P_r = Market price of rice in Naira per Kg,

X_{1r} = Taste, X_{2r} = Cleanliness, X_{3r} = Source of origin, X_{4r} = Availability, X_{5r} = Cohesion

X_{6r} = Aroma, X_{7r} =Swelling capacity, X_{8r} =Grain size, e = error term

The attributes used in the hedonic price model as well as a priori expectation is presented in Table 2. The appropriate hedonic functional form was fitted after running different functional forms based on the statistical and econometric criteria.

Table 2: Attributes Used in the Hedonic Price Model

Attributes	Survey ranking	A priori expectation
Taste	1-5 (good to bad)	Positive
Foreign materials	1-5(absent to present)	Positive
Source of Rice	1-5 (import to local)	Negative
Availability	1-5 (available to not available)	Positive
Cohesion after cooking	1-5 (Not sticky to sticky)	Positive
Aroma	1-5 (good to bad)	Negative
Swelling capacity	1-5 (Swells to does not swell)	Positive
Grain size	1-5 (long-short)	Positive

Source: Author's Illustration

RESULTS AND DISCUSSION

Socio-economic Characteristics of Respondents

The distribution of the respondents according to their socio-economic characteristics is presented in Table 3. The results revealed that the greater proportions (59.2%) of respondents were females while (40.8%) were males. This means, rice consumption especially purchase was dominated by female as more female were involved. This finding is similar to Opeyemi *et al.* (2015), who reported that majority of rice customers were females. Results further revealed that 16% of the respondents fell within the age bracket of 21-30, 37.6% within the age bracket of 31-40, 31.2% within the age bracket of 41-50 while 15.2% of the respondents were 50 years and above. Majority (68%) of the respondents were married and 46% had household sizes of 6-10 persons with a mean of 8 persons. This finding is in consonance with Basorun (2008), who reported that cooking remains the exclusive responsibility of women that are married and the preferred food is rice. With regards to primary occupation, 64% of the respondents were civil servants. In addition, the results also illustrates that 44.8% of the respondents earn above ₦80, 000 as their monthly income. The respondent's educational level revealed 65.6% of the respondents had completed tertiary education, 1.6% completed primary education, 18.4% completed secondary education and 10.4% had Islamic education. Only 5% of the respondents had no form of formal education.

Table 3: Socio-economic Characteristics of Respondents (n=125)

Variables	Frequency	Percentage (%)
Gender		
Male	51	40.8
Female	74	59.2
Age (years)		
21-30	20	16.0
31-40	47	37.6
41-50	39	31.2
>50	19	15.2
Marital Status		
Single	12	9.6
Married	85	68.0
Divorced	12	9.6
Widowed	16	12.8
Educational Level		
No formal education	5	4.0
Primary education	2	1.6
Secondary education	23	18.4
Tertiary education	82	65.6
Islamic education	13	10.4
Household Size		
1-5	40	32.0
6-10	46	36.8
11-15	21	16.8
>15	16	12.8
Primary Occupation		
Farming	8	6.4
Trading	14	11.2
Civil service	80	64.0
Others	23	18.4
Monthly Income (₦)		
<18,000	9	7.2
18,000-40,000	18	14.4
40,001-80,000	42	33.6
>80,000	56	44.8

Source: Field Survey, 2020

Rankings by Consumers for Rice Quality Attributes

Results illustrated in Table 4 revealed that price (mean=2.4) was ranked first as the most important attribute determining rice consumption. Usually, consumers are more concerned about pricing in their choice towards rice (Diako *et al.*, 2010; Nwanze *et al.*, 2006). Other factors with high determinants (mean < 4.5) include cleanliness (ranked 2nd), taste (ranked 3rd), availability (ranked 4th) and source of origin (ranked 5th) while aroma, swelling capacity, cohesion and grain size were ranked 6th, 7th, 8th and 9th respectively. The results are consistent with the findings of other researchers such as Opeyemi *et al.* (2015), who identified price, taste, source of origin and availability as the most preferred factors that determine consumer preference for rice. Similarly, Kwakwa (2013), discovered that packaging, cohesion, swelling capacity and grain size were considered as least most important attributes.

Table 4: Ranking for Rice Attributes by Consumers

Attributes	Mean	Rank
Price	2.48	1
Cleanliness	3.44	2
Taste	3.60	3
Availability	4.12	4
Source of origin	5.28	5
Aroma	6.07	6
Swelling capacity	6.09	7
Cohesion	6.86	8
Grain size	7.11	9

Source: Field Survey, 2020

Relationship between Price and Quality Attributes of Rice

Result of hedonic regression model used to determine the relationship between price and quality attributes of rice is presented in Table 5. From the results, the constant (α_0) is positive (4.544) implying that even when all the quality characteristics are zero, consumers still choose to pay a premium for the rice brands they most preferred. The error term which accounted for almost 21% of the variation in price could be attributed to environmental effects and other undetermined factors. The coefficient of determination (R^2) of 0.79 meant that the independent variables explained 79% of the variations in the dependent variable. Taste was found to have a positive relationship with price, which showed that a premium of ₦0.0439 per kg was paid for rice brands that consumers perceived to have better taste. The estimated coefficient for cohesion had a positive sign. This means that consumers in the study area prefer non-sticky rice. As expected, cleanliness, grain size and swelling capacity showed positive relationships with price. These indicated that residents in the study area prefer cleaner, long grain rice with very high swelling capacity. It can also be said that residents in the Metropolis pay premium for rice brands consisting about 0.680 times for cleanliness, 0.439 times for grain size and 0.216 times for swelling capacity. However, the result revealed that aroma, source of origin and availability carried negative signs though, not significant. This means that for consumers in the study area, as far as other quality attributes are present, they do not care where the rice is brought from.

Table 5: Empirical Result of the Hedonic Regression Model

Variables	Coefficient	Std. Error	T	Significance
Taste	.0439	.015	2.91	0.004
Source	-.270	.113	-2.38	0.019
Availability	-.150	.028	-5.31	0.000
Cohesion	.688	.128	5.34	0.000
Grain Size	.439	.091	4.79	0.000
Cleanliness	.680	.091	7.44	0.000
Aroma	-.357	.076	-4.68	0.000
Swelling capacity	.216	.074	2.91	0.004
Cons	4.544	.373	12.16	0.000
R ² = 0.79				

Source: SPSS Result Output, 2020

Conclusion and Recommendations

The study has shown that consumer preference for rice in Maiduguri Metropolitan Area was influenced by certain quality attributes and consumers are willing to pay premiums for those desirable attributes. Price, cleanliness, taste, availability and source of origin were the quality attributes that most consumers preferred. Consumers also paid premiums for taste, cohesion, grain size, cleanliness and swelling capacity.

The results indicated useful information regarding consumer behaviour that can exclusively assist policy makers, particularly the government and farmers in developing new rice production and marketing strategies. The study therefore, recommends that efforts to improve rice production in Nigeria must aim at introducing attributes such as taste, cohesion, grain size, cleanliness and swelling capacity into breeding programmes to make local rice attractive to consumers and thus helping the country to achieve its rice self-sufficiency goal. The private sector investments in modern processing facilities are needed in order to stimulate the demand and consumption for local rice with better quality. Since rice purchase is dominated by women in the study area, consideration should be given to the peculiar attributes of women who are the major decision makers in the household especially with respects to what quality and quantity of rice to purchase at home.

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