

ASSESSMENT OF FACTORS THAT INFLUENCE CONSUMERS PREFERENCE FOR FOREIGN AND LOCAL RICE IN NIGER STATE.

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ABSTRACT

The study assessed the factors that influence consumers preference for foreign and local rice in Lavun and Paikoro Local Government Areas of Niger State, Nigeria. The objectives of the study are to identify the type of local and foreign rice available to consumer's vis a vis determining the factors that influence consumers' rice preference. A total of 198 questionnaires were retrieved through a multi-stage sampling procedure from the three ward headquarters from each of the local government. Data were collected through structured questionnaire administered to the sampled respondents. Analysis of the data collected was done using descriptive statistics and Logit regression models. The results from the study shows that consumer choice of rice was influenced by certain quality attributes, and consumers were willing to pay for those desirable attributes. Food safety, aroma and long grain were the quality characteristics that most consumers preferred. The study concluded that consumer choice of rice is influenced by food safety, aroma and long grain attributes, and consumers were willing to pay for those desirable attributes. Therefore, it is recommended that farmers should produce rice that have these attributes, since these attributes were found to affect market, consumer acceptance and willingness to pay.

Keywords: Consumers, Influence, Factors, Preference, Rice.

INTRODUCTION

Rice is the most commonly cultivated cereal throughout the world today (Oko and Ugwu, 2010). Rice belongs to the family "Gramineae" and the genus "Oryza". Rice is the seed of the grass species *Oryza sativa* (Asian rice) or *Oryzaglaberrima* (African rice). Rice accounts for over 20% of global calorie intake and has been an important food commodity for most people in Sub-Saharan Africa particularly in the West African region. Nigerians consume around 5.5 million tonnes of rice annually, of which about 3.6 million tonnes are produced locally, mostly subsistence farmers while the balance of 1.9 million tonnes are imported. The large size of the rice market in Nigeria, as well as the high costs associated with importing the commodity from other countries, makes local production an attractive industry (Olorunfemi 2014).

According to Takele (2010), rice is sold and consume in all parts of the country, including Lavun and Paikoro Local Government Areas. Rice quality is judged based on attributes, which could be classified several ways. Product characteristics could either be intrinsic, such as taste, texture, or color; or extrinsic to the product, such as packaging, brand, or label. Another attribute classification distinguishes

between search, experience, and credence attributes. Search attributes are available for product evaluation before purchase, such as price, appearance, brand, and packaging. Experience attributes can be evaluated only upon product experience, thus after purchase or product use examples are taste, texture, ease of cooking, and swelling capacity. Credence attributes can be defined as an attributes that consumers cannot evaluate or verify by themselves. Instead, they rely on people or institutions, such as government controls or industry claims. Attributes relating to production, processing, and product contents are typical examples of the credence-type attributes. The aim of the study is to assess the factors that influence consumer's preference for foreign and local rice in Lavun and Paikoro Local Government Areas of Niger state, Nigeria.

Objectives of the Study

The specific objectives to be achieved are to:

- i. identify the type of local and foreign rice available to consumers; and
- ii. determining the factors that influence consumers' rice preference

RESEARCH METHODOLOGY

Study Area

The study was undertaken in two selected Local Government Areas (LGAs) Lavun and Paikoro(LGAs)of Niger State Nigeria. Niger State is located between Latitudes $8^{\circ}22'N$ and $11^{\circ}30'N$ and Longitudes $3^{\circ}30'E$ and $7^{\circ}20'E$.

Method of Data Collection

Primary data was used for the study. The data was collected using a well-structured questionnaire administered to the respondents by the researcher through multi stage sampling techniques. Information on the factor that influence consumers' rice preference such a taste, food safety, colour, price, aroma, grain size, texture, and packaging were the data required for the study.

The data collected from the field survey were analyzed using descriptive statistics and Logit regression. Specifically, Objectives (i) was achieved using descriptive statistics such as frequency distributions and means while logit regression was also used to achieve objective (ii)

RESULTS AND DISCUSSIONS

The Characteristics Consumers Consider when Buying Rice

Table 1 shows that Consumers who purchased rice were asked to rank the characteristics they consider when buying rice on a scale from most important to least important with 1= most important, 2= second most important and 8= least important. Majority (70%) of the respondents ranked taste as the first most important characteristic considered when purchasing rice. Price was ranked second, aroma (scent) was ranked third, food safety was fourth, colour of rice grain was fifth, grain size was sixth ranked and texture was the seventh-ranked attribute. Packaging of rice was considered the least-important attribute.

Note: Mean importance is calculated with the values of 1 for most important and 8 for least important. Hence, a lower mean indicate a greater importance).

Table 1: Relative importance rankings by consumers for rice attribute

Attributes	Mean score	Rank
	5.90	1
Taste	4.82	4
Food safety	4.67	5
Colour	5.48	2
Price	5.22	3
Aroma	3.55	6
Grain size	3.00	7
Texture	2.42	8
Packaging		

Source: Field Survey (2020)

To determine whether or not rice consumers differentiate between these various rice attributes, the Kendall's coefficient of concordance was applied. The test results are presented in Table 2 below.

Table 2: Kendall's coefficient of concordance

Test Statistics	
N	198.00
Kendall's W	0.48
Chi-Square (χ^2)	743.00
Degree Of Freedom	8.00
P-Value	0.01

Source: Field Survey (2020)

The Kendall 's Co-efficient of Concordance (W) for the rankings of rice attributes as shown in table 2 above is 0.48. This means that the degree of agreement on a zero to one scale is 0.48. The degree of unanimity as measured by the W-statistics is 48% since the score is zero for random ranking and 1 for perfectly unanimous ranking. Thus, to a large extent, there is agreement among respondents with regards to the rankings provided. The asymptotic distribution gave a significance level value of 0.01, which is less than 0.05. Thus, the null hypothesis (the rankings disagree) is rejected and the alternative hypothesis (the rankings agree) is accepted. Thus, consumers in the study area can therefore, be said to generally agree that the most important attributes of rice are more related first to taste, secondly to price, followed by aroma, food safety, color, grain size, texture with packaging been the least important attributes.

Consumer Preferences for Rice Attribute

The results of the conditional logit model with and without interactions are reported in Tables 3 and 4. The coefficients obtained as the result of the estimations explain the impact that each attribute had on the choice of the product. Significant positive coefficients indicate that the attribute level in question had a positive impact on the probability that the consumers 'choose the alternative and negative ones mean that the consumers had some degree of aversion for that product attribute. For continuous variables such as the price a negative coefficient means that, the smaller the variable value, the larger the utility derived from the alternative and the probability to select it. A

coefficient value near zero implies that the consumers were indifferent for the rice attribute.

Table 3: Conditional logit without the interaction

Attributes	Coefficients	Std. Error	Z-value
Taste	-2.8412***	0.0635	-28.89
Food safety	1.5226***	0.0617	34.64
Aroma	0.2111***	0.0518	2.75
Price	-0.3474***	0.0111	-19.67
Long	2.2761***	0.0629	28.76
Medium	-0.1111**	0.0545	-2.01
Number of observations			198
LR chi2 (6)			2246.25
Prob> chi2			0.0000
Log likelihood			-1322.87
Pseudo R-Squared			0.34

Note: ***, ** and * indicates significant at 1%, 5% and 10% respectively

Source: Author's own calculation (2020).

Result of the conditional logit without the interaction terms (Table 3) shows that all the choice specific attributes of rice are statistically significant. However, basic conditional logit as indicated in Table 3 assumes homogeneous preferences across households presented with each version of the choice experiment questions (Demont, 2013). However, preferences across households are in fact heterogeneous and accounting for this heterogeneity enables estimation of unbiased estimates of individual preferences and enhances the accuracy and reliability of estimates of demand, participation, marginal and total welfare (Dutta, 2014). While respondents' unobserved heterogeneity can be detected by applying the conditional logit models, they are not well suited for explaining the sources of heterogeneity (Ekeleme *et al.*, 2009). The study therefore opted for the second way of accounting preference heterogeneity thus, interacting the relevant socio-economic parameters with the choice specific attributes. A log-likelihood ratio test showed that including interaction terms led to an improvement in model fit. The results of the final conditional logit with interaction terms are presented in Table 4 below.

Table 4: Conditional logit estimates with interactions

Attributes	Coefficients	Z-values	P>{z}
Taste	-1.6000***	-6.47	0.001
Food safety	1.8614***	6.42	0.002
Aroma	0.7360**	3.30	0.010
Long	1.3233***	4.00	0.002
Medium	-0.0864	-0.30	0.673
Price	-0.4700***	-24.44	0.000
Taste*gender	0.0027	0.30	0.800
Taste*age	-0.0026	-1.30	0.302
Taste*hhsz	0.0126*	2.00	0.094
Taste*years of edu.	-0.0477**	-2.39	0.025
Taste*income	0.0008**	2.39	0.034
Food safety*gender	0.1161**	2.41	0.021
Food safety*age	-0.0049	-0.88	0.333
Food safety*hhsz	-0.0333	-0.29	0.605
Food safety*ys of edu.	0.0216	0.69	0.282
Food safety*income	-0.0004	-0.70	0.600
Aroma*gender	-0.3000***	-2.70	0.005
Aroma*age	0.0020	0.70	0.400
Aroma*hhsz	0.0309	0.72	0.489
Aroma*ys of edu.	-0.0320**	-2.20	0.020
Aroma*income	-0.0003	-0.20	0.839
Long*gender	0.2381***	3.00	0.009
Long*age	-0.0020	-0.86	0.487
Long*hhsz	-0.0607	-1.40	0.200
Long*ys of edu	0.0228**	2.22	0.045
Long*income	0.0002	0.31	0.700
Medium*gender	-0.0745	-0.62	0.607
Medium*age	0.0034	0.49	0.640
Medium*hhsz	-0.0242	-0.80	0.510
Medium*ys of edu	0.0031	0.27	0.798
Medium*income	0.0005	0.74	0.487
Number of observations		198	
LR chi2 (6)		2293.34	
Prob> chi2		0.000	
Log likelihood		1422.41	
Pseudo R-Squared		0.48	

Note: ***, ** and * indicates significant at 1%, 5% and 10% respectively
Source: Authors own calculation (2020).

The pseudo R² values were fairly low for both models with and without interactions, implying that the results explain only a limited proportion of the choices. However, the pseudo R-squared suggest that the attributes selected for the choice experiment survey

are, by and large, what consumers considered to be among the most important attributes in rice variety selection. The price variable as expected has a negative and statistically significant, indicating that, holding other factors constant, respondents will be less likely to choose an option if its price is higher. Thus, increments on the price decrease the associated utility level provided by the choice option. From the estimation, it can be noted that taste variable has a negative coefficient and statistically significant. Almost all empirical studies reported that taste tends to play an important role in consumer preferences.

On the other hand, the variable food safety exhibited positive coefficient and statistically significant, signifying that rice consumers who are willing to pay for this rice product attached more importance to its food safety. This result may be explained by the relatively good correlation between organically produced rice with the consumer's health consciousness. This result agrees with the studies conducted by Galawat and Yabe (2010), for consumers in the South of Italy which showed that organic food was highly valued by consumers due to perceived benefits to the environment and consumer's health. The findings suggest that the Nigeria consumers have a health and safety perspective while consuming rice. Greater consumer preference for organic rice indicated enough market potential for the local farmers.

The coefficient calculated for dummy variable of rice aroma has positive sign and represents the positive relationship between this trait in the rice and consumers 'willingness-to-pay'. This result represents the high importance of aromatic rice for consumers in the study area. The obtained result is similar to that of Brunei and Pant (2009) in Nepal. Brunei consumers' as shown by Galawat and Yabe study and Nepal consumers prefer aromatic rice as well, as Pant (2009) presented in his study.

Diako *et al.*, (2010) also showed that aroma determined consumer preference for rice and consequently influence their willingness to pay. This result is promising for producers and other stakeholders in the local rice industry. Following this observation, an obvious improvement in this attribute will serve as a marketing strategy for local rice products. During the study it was realized that consumers 'preferred imported rice brands which were also noted to be of good aroma and sold at a higher price compared to other rice brands on the market. This therefore indicates that aroma is a unique characteristic and an important quality trait that consumers 'value'. Table 4, also reports the results obtained with the interactions of the socio-demographic and the choice specific attributes. Results indicate that when the socio-demographic characteristics are included, grain size (medium grain) attribute is not statistically significant in the selection of rice, while the rest of the choice specific attributes remain statistically significant. When looking at the role of the socio-demographic variables, the interaction term between gender and food safety is statistically significant. The results indicate that females are more sensitive to food safety problems than their male counterparts (Abdullahi *et al.*, 2011).

The variable income, which represent the income of the household, has a positive effect and statistically significant when interacted with the choice attribute denoting taste. This

shows that higher income consumers are more likely to select rice brand with a good taste.

The variable household size, which represents the number of people within a specific household also, has a positive and statistically significant when interacted with the choice attribute taste. This indicates that the larger the number of people in a household the less likely they will be concerned with taste. The variable education, which represents the number of years of education of the respondent, has a negative and statistically significant effect when interacted with the attribute taste. The variable gender has a negative and statistically significant effect when interacted with the attribute aroma. This indicates that female shoppers are less likely to be concerned about aromatic rice.

CONCLUSION AND RECOMMENDATIONS

From the findings of this study, it was concluding that consumer choice of rice is influenced by food safety, aroma and long grain attributes, and consumers were willing to pay for those desirable attributes. Therefore, it is recommended that farmers should produce rice that have these attributes, since these attributes were found to affect market, consumer acceptance and willingness to pay. Also private sector should invest in modern processing facilities for local rice this would place the commodity in a better position when compared with imported rice commodity. This will encourage local rice consumption and also afford the farmers a good price for the local commodity being produced.

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