



**Determinants of consumer preference for imported and local rice among households in Sokoto metropolis**

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**ABSTRACT**

The study was designed to assess the determinants of consumer preference of local and imported rice among households in Sokoto metropolis, Nigeria. Two-stage sampling technique was employed, where in the first stage, Sokoto-North, Sokoto-South and some parts of Wamakko Local Government Areas (LGAs) were purposively selected. In the second stage, systematic sampling was employed and 27 households from each area were selected, making a total of 81 respondents selected for the study. Data were collected using structured questionnaire while descriptive statistics and regression were employed to analyze the data. The households' characteristics revealed that 22.5% of the respondents were 70-79 years old. The mean household size was about 16 persons, 82% were married, 58.9% were civil servants and high-income earners and 63.3% of the respondents attained tertiary education. The preference of locally processed rice (52%) as against imported rice was because it has lower price and better taste while, some consumers prefer the imported rice because of its cleanliness and free from stones and other impurities that are commonly found in locally processed rice. Household size and household income had a positive and significant relationship with consumer preference for local rice. It is recommended that Government should provide new technologies and/or facilities for local rice production and processing to enhance the rice quality. This will enable the locally processed rice to compete with imported rice in the domestic and international markets.

**Keywords:** Consumer; households; rice; quality; price; preference

**INTRODUCTION**

Rice is a very important food crop consumed as a staple food across the globe. Rice is consumed by more than 4.8 billion people in 176 countries and is the most important food crop for over 2.89 billion people in Asia, over 40 million people in Africa and over 150.3 million people in America (FAOSTAT, 2020). Rice consumption in Nigeria is growing, particularly among urban dwellers. The country ranks first as both producer and consumer of rice in the West African sub region (AfricaRice, 2018).

Rice consumption is expected to increase annually by about 15% per annum occasioned by changing preference by consumers (Chidiebere, 2020). Rice consumers are very sensitive to quality and are ready to pay higher prices for better quality (Akoa-Ecoa *et*

*al.*, 2016). Price differences between rice samples of different quality classes indicate that grain quality attributes must be contributing to the price of rice. However, preference for quality attributes and how they influence consumer purchase prices is region-specific (Calingacion *et al.*, 2014). Furthermore, Bailey *et al.* (2020) argued that the quality of imported rice is far better than the Nigerian produced rice. Rahji and Adewumi, 2018 reported that households are dissatisfied with Nigerian rice bought in the market and are weary of picking stones from the Nigerian rice and having to wash it several times. Achieving self-sufficiency in rice production and consumption is not a function of only planting large hectares of land with rice neither does it end at producing millions of tonnes of paddy rice. The quality and quantity of processed Nigerian rice available in the market closes the rice import gap.

The Nigerian rice sector has witnessed some remarkable developments, particularly in the last thirteen years. Both rice production and consumption in Nigeria have vastly increased during the aforementioned period (Ojoehemon *et al.*, 2009). However, the demand for rice has continued to outstrip production given the shift in consumption preference for rice especially by urban dwellers and reached 6.4 million tonnes in 2020 (KPMG, 2021).

Furthermore, the majority of rice production and processing in Nigeria is in the hands of resource poor subsistent farmers who lack the economic and social power to fully adopt farming technology. Availability of a sustainable rice processing technology for Nigerian resource-poor rice farmers is important if the country's effort at achieving self-sufficiency in rice production must be achieved. However, generating agricultural technologies is meaningful only when they are adopted at the farm level. However, considerable previous research studies have focused on identifying the constraints to increasing domestic rice production in Nigeria (Olorunfemi, 2014; and Lawton & Alvaro, 2020). Other studies have focused on explaining the growth of rice consumption. There exists little empirical information on the determinants of rice consumption preference between imported and local rice at the household level. This constitutes the gap in research that this study is designed to fill. Therefore, this study was carried out to examine consumption preference between imported and local rice among households in Sokoto Metropolis. The objectives are to: assess the level of preference of local rice and imported rice; determine the factors influencing household preference on local rice; and identify the major constraints to the consumption of imported and local rice.

## METHODOLOGY

### Study Area

This study was carried out in Sokoto metropolis of Sokoto state. The area lies between latitudes 13° 23' 27" and 13° 46' 0" N and longitudes 5°39'18.76" and 5° 48' 2" E. The area has minimum rainfall of 500 mm and maximum of 800 mm (NiMeT, 2019). The wet season starts from May/June to September/October (SRRBDA, 2006). The areas had a population of 182,296 people in 2006 (NPC, 2006) and projected population of 289,800 in 2020. The mean monthly temperature varies between 13°C in December/January and 42°C in April with the average annual temperature being 34°C (NiMeT, 2019). The area is dominated by Hausa and Fulani and the major occupation of the people is agriculture including crop farming such as the cultivation of sorghum, millet, rice, sweet potato, onion etc. fishing and leather work.

### Sampling Technique

Two-stage sampling technique was employed, where in the first stage; Sokoto-North, Sokoto-South and Wamakko Local Government Areas (LGAs) were purposively selected on the basis of predominant different households' income level in the areas. In the second stage, systematic sampling was employed in selecting 27 households from each area, thereby making a total of 81 respondents selected for the study.

### Data Collection

The primary data collected using a structured questionnaire from the selected household members include socio-economic characteristics, consumer taste and preference for local rice and imported rice and factors such as price of the rice, household size, education level, taste of rice, type of rice, price of rice that are assumed to determine the consumer choice of rice.

### Data Analysis

To determine the factors influencing household preference on locally processed rice, an empirical model was specified. A Cobb-Douglas regression model on consumer behavior was used as adopted from Bonti-Ankomah and Yiridoe (2006); Millock *et al.* (2002); Zeng and Wei (2005). Earlier studies assumed linearity because the aim of the study was to test whether there existed any association between the variables under study. However, this study experimented with four different equation forms which were fitted to the data.

The implicit form of the regression model was specified as:

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, u) \text{-----(1)}$$

Among functional forms of the regression model only double logarithmic (Cobb-Douglas) form fitted to the data. The Cobb-Douglas model was adjudged to be the best based on the normal economic, econometric and statistical criteria used for further analysis. The explicit form of the models is:

Double log (Cobb-Douglas):

$$\ln y = \beta_0 - \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + \beta_5 \ln X_5 + \beta_6 \ln X_6 + \beta_7 \ln X_7 + \mu \text{.....(2)}$$

Y= brand for locally processed and imported rice,  $\beta_0$  = intercept,  $\beta_1 - \beta_8$  = Parameters to be estimated,  $X_1$  = price of locally processed rice in naira,  $X_2$  = income of the consumer in naira,  $X_3$  = education level (years),  $X_4$  = household size (number of people in the household),  $X_5$  = taste and preference of the consumer (preference index),  $X_6$  = consumer willingness to pay for locally processed rice (yes= 1, no= 0),  $\mu$  = error term

## RESULTS AND DISCUSSION

### Socio-Economic Characteristics of the Respondents

Table 1 presents the result of the socio-economic characteristics of the respondents which include gender, age group, marital status, household size, educational level, occupation and income of the respondents.

The result shows that majority (83.8%) of the respondents were male while 16.20% were female, implying that most of the purchasing decision in the household was mostly

made by male as compared to their female counter parts. Damardjati and Oka (2013) posited that family purchasing decision is dependent on male (fathers especially) of the house.

Table 1: Socioeconomic characteristics of the respondents

Gender	Frequency	Percent
Male	67	83.80
Female	14	16.20
Total	81	100
Age Group		
20-29	6	7.5
30-39	9	11.25
40-49	16	20.0
50-59	16	20.0
60-69	15	18.75
70-79	19	22.5
Total	81	100
Household Size		
1 – 5	12	15.0
6 – 10	21	26.25
11 – 15	16	20.0
16 – 20	20	25.0
21 – 25	12	13.75
Total	81	100
Education Level		
Qur'anic	32	40.0
Primary	4	5.0
Secondary	11	13.8
Tertiary	34	41.2
Total	81	100
Occupation		
Farming	13	16.3
Business	62	77.5
Civil Servant	6	6.3
Total	81	100

The table also revealed that more than 50% of the respondents are within the age limit of 30 – 60 years, while 22.5% are within the age group 70 – 79 years, and 7.5% of the respondent are of age group 20-29 years of age. This shows that majority of the respondents are within their prime ages of taking family responsibilities especially in an African tradition. This further implies that most of the respondents are head of the household who are making family consumption decision. This was in conformity with the work of (Simsek and Karkacur, 1996) who stated that age of the household head can influence consumption decision of the household.

The average family size of the respondents was 16 members, this implies that the sampled households were relatively large, hence the household have higher demands and consume more than smaller households. This means, the size of the households plays a significant role in determining the quantity of food consume in the family. This finding is in line with the findings of Ehikioya (2015) who reported that the household with large family size have higher demands and consume more than smaller household consumes.

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Furthermore, 41.2% had secondary school certificate while 5.0% had primary education. This implies that educational qualification is a determinant factor in choosing what family consumes. This complies with the findings of Ojogho and Erhabor (2011), who reported that the households with higher education qualification, understand the best brand of rice the family consumes

Results further revealed that 77.5% of the respondents were engaged in trading, while 6.3% were civil servants, this implies that most of the respondents were engaged in different marketing activities who understand the market activity and have the knowledge on how to select good quality rice for household consumption. This agrees with the findings of Akaeze (2010), who reported that most respondents are business operators who understands market activity and consumer quality.

### Income of the Respondents

Income is money earned from occupational activities of an individual, the results from the Table 2 show that the majority (57.5%) of the respondents earn more than ₦100,000, while 20% earns less than ₦50,000 as income. Since income is an important determinant on how individual is willing to spend, therefore, the sample household possess the key factor that determines affordability of preferred brand of rice. This corroborated with the findings of Akaeze (2010) who asserted that respondents can be able to afford their preferred brand of rice when their income permits.

Table 2: Income distribution of respondents

Income (₦)	Frequency	Percentage (%)
Less than 50,000	16	20
50,000 – 100,000	18	22.5
101,000 – 150,000	8	10
151,000 – 200,000	30	37.5
More than 200,000	9	10
Total	81	100

### Brand of Rice Preference by Respondents

In terms of brand preference, results (Table 3) revealed that 20% of the respondents preferred imported rice to local rice, 52% of the respondents preferred local rice while the remaining 27.6% of the respondents had preference for both local and imported rice. This confirms that the majority of the respondent's preferred local rice to imported rice, followed by those that preferred both local and imported rice while the least preferred rice by the sampled households is imported rice. In general, the locally processed rice has a higher preference over imported rice in the study area, agreeing with the finding of Chidiebere (2020).

Table 3: Respondents rice preference

Preferred	Frequency	Percent
Imported Rice	16	20.0
Local Rice	42	52.5
Both	22	27.6
Total	81	100

### Factors Influencing Locally Processed Rice Preference

Factors that determine individual preferences for local brand of rice differ from one person to another. These factors are taste, availability, price, easy to prepare among others. Result (Table 4) indicated that 20% of the respondents preferred locally processed rice to imported rice largely due to taste, 47.5% prefer locally processed rice because it is more available, 23.8% of the respondents preferred local rice because its affordability, while 8.8% of the respondents attributed their preference of local rice to the fact that the brand is very easy to prepare compared to imported rice. This implies that the main factor that determines local rice preference in the study area is the availability.

Table 4: Factors influencing preference for local rice

Attributes	Frequency	Percent
Taste	16	20.0
Availability of the rice	38	47.5
Lower price	19	23.8
Easy to prepare	8	8.8
Total	81	100

### Factors influencing Imported Rice Preference

Table 5 presents the factors influencing the respondents' interest in imported rice over the locally processed rice. The result shows that 22.5% of the respondents preferred imported rice over local rice because of the brand taste, 18.8% says because of its availability, 10% and 48.75% preferred imported rice because of the price and ease of preparation respectively. This means that preference for imported rice over the locally processed rice is because the brand is very easy to prepare when compared to local one, followed by its taste, availability and the least factor is price.

Table 5: Factors influencing preference for local rice

Attributes	Frequency	Percentage
Taste	18	22.5
Availability of the rice	15	18.8
Cheap rice	9	10.0
Easy to prepare	39	48.75
Total	81	100

### Determinants of Consumer Rice Preferences

Table 6 presents the results of regression analysis showing the relationship between brand of rice preferences and factors influencing the demand for locally processed and imported rice.

The results show  $R^2$  value of 0.343 which implies that 34.3% of the variation in Y (Brand of rice preferred) was explained by the variation in predictor variables included in the model. The F-values is 6.801 with corresponding p-value of 0.000 was statistically significant at both 1% and 5% level of significance and this signifying a good model.

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The result also shows that the estimated coefficient for household income is positive and statistically significant ( $p < 0.05$ ) for the probability of households willing to pay higher prices for imported rice brands. This implies that an increase in household income increases the probability of household willing to pay for imported rice brands. This further affirmed the result in Table 2 which indicates that majority of the households earn more than ₱100,000, since income is an important determinant on how individual is willing to spend, therefore, the sampled households possess the key factor that determines affordability of preferred brand of rice.

Table 61: Determinants of consumer preferences for rice

Variables	B	Std. Error	t-values	P-values		
Constant	2.556	0.408	6.264	0.000***	Adjusted R <sup>2</sup>	0.293
Level of Education	-0.092	0.096	-0.955	0.343	F-value	6.801
Household perception	-1.43	0.003	-1.331	0.188	p-value	0.000
Household Income	0.714	0.168	4.256	0.000***	R <sup>2</sup>	0.343
Household size	0.047	0.014	3.434	0.001***		
Occupation	0.222	0.168	1.321	0.191		

\*\*\* = Significant at 1% level

\*\* = Significant at 5% level.

Household size has a statistically significant ( $p < 0.01$ ) positive coefficient (0.047), t-value of 3.343, indicating that the impact of household size in the choice of rice consumed by individual in the study area is significant, hence the preference of an individual in the choice of rice brand is determined by the size of the households. This could be connected to the fact that the average household size in the study area is sixteen (16) and most of the sampled households preferred locally processed rice to imported rice. Therefore, the preference of the household in the study area is largely determined by the size of the household.

### Major Constraints to the Consumption of Imported and Local Rice

Table 7 presents the results of constraints that prevent the respondents from consuming brand of imported rice in the study area. The results show that more than 90% of the respondents attributed the low consumption of imported rice to high cost, while 7.5% believed cost was not a constraint.

Table 72: Constraints to consumption of imported rice

Attributes	Strongly Agree	Agree	Disagree	Strongly Disagree
High Cost	67 (83.8%)	7 (8.8%)	2 (2.5%)	4 (5.0%)
Poor quality	4 (5.0%)	19 (23.8%)	43 (53.8%)	12 (15.0%)
Affordability of the products	35 (43.8%)	15 (18.8%)	15 (18.8%)	15 (18.8%)
Lack of competitive Advantage	4 (5.0%)	13 (16.3%)	48 (60.0%)	3 (3.8%)
Broken grains and debris	5 (6.3%)	6 (7.5%)	35 (43.8%)	31 (38.8%)
Low swelling capacity	4 (5.0%)	6 (7.5%)	25 (31.3%)	45 (56.3%)

Other constraints as agreed by the respondents were poor quality, lack of competitive advantage, broken grains and debris, and low swelling capacity, with cumulative percent responses of 68%, 64%, 82%, and 87% respectively. From the table also, the affordability of the brand of rice was seen as the obstacle in consuming imported rice in their household, with

a cumulative 62% of the respondents either agreeing or strongly agreed that the affordability of the product in their households was a constraint, while others believed it has no influence in their household's consumption of the brand.

Table 8 shows the results of constraints that prevent the respondents from consuming locally processed rice in the study area. The results show that most of the respondents (above 70%) either disagreed or strongly disagreed that cost of the local rice is a constraint to consumption, while 20.0% and 8.8% strongly agreed and agreed respectively that high prices of the locally processed rice is a constraint to consumption. Presence of husk, dirt and stones is a major constraint that discourages respondents from consuming the locally processed rice with a cumulative 87.6% of the respondents either strongly agreed or agreed that the presence of husk, dirt and stones in the local rice prevent them from eating the brand, while 11.3% disagree and strongly disagree to that assertion. For the product quality, a cumulative 55.1% of the respondents were of the opinion that the poor quality of the local rice was the factor that prevent their households from local rice consumption, while the remaining cumulative 45% disagreed. In the area affordability, the respondents were evenly divided that ability to afford the price of the rice was the factor that prevent them from the brand consumption. Similarly, majority of the respondents (88.1%) agreed that the lack of competitive advantage was the major factor that prevent them from consuming the brand and the remaining 11.9% disagreed. Broken grains and debris was another factor considered by respondents (61.3%) as the main constraints that prevent them from consuming the brand, while the remaining 28.7% disagreed. Low swelling capacity was considered as a constraint in consuming local rice by 40% of the respondents while the remaining 60% sees it as a no constraint.

Table 8: Constraints to consumption of local rice

Attributes	Strongly Agree	Agree	Disagree	Strongly Disagree
High Cost	16 (20.0%)	7 (8.8%)	7 (8.8%)	58 (62.5%)
Presence of husk, dirt, and stones	35(43.8%)	35(43.8%)	6 (7.5%)	3(3.8%)
Poor quality	11(11.3%)	35(43.8)	32(40.0%)	4(5.0%)
Affordability of the products	34(42.5%)	8(10.0%)	26(32.5%)	12(15.1%)
Lack of competitive Advantage	35(43.8%)	35(43.8%)	6(7.5%)	3(3.8%)
Broken grains and debris	12(15.0%)	37(46.3%)	18(22.5%)	13(16.3%)
Low swelling capacity	14(17.5%)	19(23.8%)	22(27.5%)	25(31.3%)

## CONCLUSION

The results emanating from this study have shown that household size and income of household heads are important determinants of consumer preference and willing to pay higher prices for local rice brands. This could be connected to the fact the average household size in the study area was sixteen (16) and the majority of the sampled households preferred local rice to imported rice. Therefore, the preference of the household in the study area is determine by the size of the households.

Lower prices and better taste of locally processed rice are the major attributes preferred by the consumers while, some consumers prefer the imported rice due to its cleanliness and free from stones and other debris that are commonly found in locally processed rice in the study area.

Based on the findings of this study, the following recommendations are made:



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New technologies and facilities for local rice production and processing to enhance the rice quality should either be provided or supported by governments and other rice production stakeholders. This will enhance the competitive advantage of the local rice.

There is a need for improvement in grain physical quality characteristics of local rice so that it mimics imported rice as to attract premium price and improve preference of local rice. This can be done by careful genetic improvement of the grain physical quality traits in the existing varieties.

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