



ANALYSIS OF CONSUMERS BEHAVIOUR ON RICE CONSUMPTION IN BAUCHI STATE, NIGERIA

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ABSTRACT

The study analyzed the consumer's behavior on rice consumption in Bauchi State, Nigeria. A multi stage sampling technique was used in selecting 450 respondents for the study. Data were collected using questionnaire and analyzed using descriptive and inferential statistics. The result shows that majority (81.3% and 85.1%) of the respondents were male and married. The result also showed that about 37.6% and 24.9% of the respondents had tertiary and secondary education. The result further shows the mean age, mean household size, mean annual household income, mean monthly quantity of rice purchased mean price of rice per *mudu* and mean monthly rice expenditure as 40 years, 9 persons per household, ₦370, 526, 19.74 and ₦779.38, 20,738 respectively. The result revealed that about 44.0% and 27.3% of the respondents consume rice on monthly and special occasions with majority (58.9%) of them having preferred white rice and stew as their best rice dishes. The result further showed that household size, educational level, occupation of the household head, marital status price of rice and household head income, were the significant ($P<0.01$, $P<0.05$ and $P<0.10$ respectively) factors determining rice consumption and expenditure in the study area. The result concluded that rice is a major staple food in every household in the study area, but it is not regularly consumed by most of the household in the study area because of the high cost. From the findings of the study, positive relationship between price and expenditure shows rice is no longer a luxury food but a necessity food which is now used to prepare different forms of dishes such as *tuwo*, *kunu*, *masa*, *Dan wake* and therefore serve as substitute for most cereal based food. It is therefore recommended that government should provide policies and programmes that will improve the production of rice in the study area and the country at large that will increase the supply of the commodity in the market, hence reducing its price.

Keywords: , Behaviour, Consumers, Consumption, Expenditure and Rice

INTRODUCTION

According to the Food and Agriculture Organization (FAO, 2020), Nigeria is the largest consumer of rice in Africa, accounting for about 30% of the continent's total rice consumption. The country's rice consumption has been increasing steadily, from 4.6 million metric tons in 2010 to 6.3 million metric tons in 2020 (USDA, 2020). Several factors influence consumer behavior towards rice consumption in Nigeria. A study by Oyewole *et al.* (2021) found that price, income, and cultural background are significant factors influencing rice consumption in Nigeria. Another study by Akinbode *et al.* (2022) found that product quality, packaging, and brand loyalty also play important roles in consumer purchasing decisions. The demand for rice in Nigeria is expected to continue growing due to population growth, urbanization, and changing dietary habits (IFPRI, 2023). Therefore, understanding consumer behavior towards rice consumption is crucial for the development of effective marketing strategies and policies to meet the increasing demand.



Consumer behavior towards rice consumption in Nigeria is also influenced by cultural and social factors. Rice is a staple food in many Nigerian households, and its consumption is often tied to cultural and social events (Oyewole *et al.*, 2021). A study by Adebayo *et al.* (2022) found that Nigerian consumers prefer local rice due to its cultural significance and perceived better quality. Demographic factors such as age, gender, income level, and education level also play a significant role in shaping consumer behavior towards rice consumption in Nigeria (Akinbode *et al.*, 2022). For instance, younger consumers are more likely to prefer imported rice, while older consumers prefer local rice (Oyewole *et al.*, 2021). The marketing and distribution of rice in Nigeria also influence consumer behavior. A study by Yusuf *et al.* (2023) found that Nigerian consumers prefer to purchase rice from traditional markets and street vendors due to convenience and affordability. Bauchi State, located in the North-Eastern part of the country, is one of the major rice-producing states in Nigeria (NBS, 2021). Understanding consumer behavior towards rice consumption is crucial for policymakers, marketers, and stakeholders in the rice industry. This study aims to analyze the consumer behavior towards rice consumption in Bauchi State, Nigeria. Consumer behavior is influenced by various factors, including cultural, social, personal, and economic factors (Kotler *et al.*, 2020). In the context of rice consumption, cultural and social factors play a significant role (Adebayo *et al.*, 2022). For instance, rice is a staple food in many Nigerian households, and its consumption is often tied to cultural and social events (Olagunju *et al.*, 2020). Several studies have examined consumer behavior towards rice consumption in Nigeria (Adebayo *et al.*, 2022; Olagunju *et al.*, 2020; NBS, 2021). However, there is a need for more research on this topic, particularly in Bauchi State, where rice consumption is high (NBS, 2021). This study aims to bridge this gap by examining the consumer behavior towards rice consumption in Bauchi State, Nigeria. The broad objective of the study was to analyze the consumers' behaviour on rice consumption in Bauchi State, Nigeria. The specific objectives were to; describe the socioeconomic characteristics of the rice respondents in the study area; describe the frequency of rice consumption in the study area; determine the socio-economic factors that influence respondents' expenditure on rice consumption; and identify the constraints to rice consumption in the study area.

MATERIALS AND METHODS

The Study Area

The research was conducted in Bauchi State. Bauchi State is located in the Sudan Savannah and some parts of northern guinea savannah zones of Nigeria. It is situated between latitudes $9^{\circ}3'$ and $12^{\circ}30'$ North of equator and longitudes $8^{\circ}50'$ and 11° East of the Greenwich meridian. It occupies a land mass of about $49,235\text{km}^2$ representing about 5.3% of Nigeria's total land mass, encompassing about 42 million hectares of cultivable land of which only about 3,298,166.6ha is presently being cultivated. About 180,000ha of potential *fadama* land mostly located along the drainages of which only about 25,000ha have been developed are key opportunities for dry season and irrigation farming. Bauchi State falls within the Sudan and Sahel vegetation zones of Nigeria with distinct seasonal regimes of dry and wet season. Rainfall ranges from 600mm in the extreme north to about 1,300mm in the south west of the State. The rainy season varies from about 95 days in extreme north to 170 days in the south. These are the major climatic factors influencing cropping pattern and other farming practices. Temperature ranges from a minimum of 9.11°C in December/January to a maximum of 40.55°C between April and May. The unpredictable nature of the climate due to global warming affects the agriculture and socio-economic activities of the citizenry (BSADP, 2010).



The State comprises of twenty (20) Local Government Areas and according to the National Population Commission [NPC] (2006) the population of Bauchi State was 4,476,465 who are mostly peasants engages in crop and livestock productions. At current growth rate of 3.5% the population of Bauchi State is expected to 7,139,961. The major crops grown include sorghum, millet, maize, rice, groundnuts, soya beans, cowpea and sesame.

Sampling Techniques

A multi-stage sampling technique was used in the selection of respondents. In the first stage; Bauchi State was stratified into three (3) agricultural zones, which were considered as strata. In the second stage; from each strata (agricultural zone), proportionately 30% of LGAs were randomly selected from each zone. Thus two LGAs were randomly selected out of seven from western zone, one out of four in central zone and three out of nine from northern zone, making a total of six (6) LGAs. In the third stage; one ward (local government metropolitan) were purposively selected from each of the selected L.G.As in Bauchi State giving a total of 6 wards. In the fourth stage; simple random sampling procedure was applied to select 78 households from each of the selected ward. In the final stage; simple random sampling technique was applied to select the sample size of 450 respondents using Yamane formula for determining sampling size for the study.

Yamane formula for determining sampling size is expressed as:

$$n = \frac{N}{1 + N(e)^2} \quad \dots (1)$$

Where;

- n = Sample size,
- N = Total population
- e = Margin of error

Method of Data Collection

Data were collected through the use of questionnaire. The information were collected on sex, marital status, age, household size, education level, occupation, income of the household head, location, quantity of rice purchased, price, share of income spent on rice, preference rating for the rice brands as well as constraints to rice consumption.

Method of Data Analysis

The tools include both descriptive and inferential statistics. The descriptive statistics used include; frequency, percentages, means, and ranking. The inferential statistical tools used multiple regression.

Specification of the multiple regression models

The multiple regression was used to determine the influence of socio-economic factors on respondents' expenditure on rice in the study area. The model was used to achieve objective iii of the study.

The multiple regression model is specified as follows:

$$Y_{ijk} = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + e \quad \dots (3)$$

Where:

- Y_{ijk} = Quantity of rice purchased (Kg)
- X_1 = Age of the household head (years)
- X_2 = Marital status of household head (dummy variable)
- X_3 = Household size (Number)
- X_4 = Education level of the household head (dummy variable)
- X_5 = Occupation of the household head (dummy variable)



X_6 = Price of rice/kg (N)

X_7 = Monthly household head income (N)

b_1 ($i=1 \dots 7$) are regression coefficients and direct measures of elasticity.

b_0 = Constant term of intercept

u = error term

RESULTS AND DISCUSSION

Socio-economic Characteristics of Rice Consumers

Table 1 shows the distribution of the respondents according to sex, marital status, educational level and occupation. The results showed that most (81.3%) of the household heads were male while 18.7% were female. This suggests dominance of male gender as household heads in the study area. More so, the males dominate marketing due to the cultural factors that encourages them to go out to purchase material needs of the family (Akinleye, 2009). These results also agreed with the findings of Abdulrahman *et al.* (2013) who reported that there were more male participants in their studies in Ondo State. The results of the marital status of the respondents revealed that, majority (85.1%) were married, 7.1% were single, 4.7% was divorced and 3.1% were widowed. This agrees with the findings of Oladejo *et al.* (2019) who found out that married consumers accounted for majority of rice consumption in Nigeria than single consumers. Adebisi *et al.* (2020) and Olaniyan *et al.* (2023) found that married consumers were more likely to purchase rice than single consumers. The Table 3 also shows the distribution of respondents according to educational level. The result revealed that 18.2% of the respondents had no formal education, 13.1% had quranic education, 6.2% had primary education, 24.9% had secondary education and 37.6% had tertiary Education. Nnamdi (2010); Abdulrahman *et al.* (2013) and Alimi, (2013) also reported that majority of the respondents in their various studies had secondary education. Adebisi *et al.* (2020) found that consumers with higher education were willing to pay more for high-quality rice, while consumers with lower education prioritized price over quality.

The Table 1 further shows the distribution of respondents according to occupation. The result revealed that 34.2% were artisans, 24.0% were farmers, and 23.3% of the respondents were into business, 17.3% were civil servants and 1.1% falls within other jobs categories among others. This disagrees with the findings of Ameh and Iheanacho (2019) who reported that the majority of rice consumers in Benue State, Nigeria were farmers, followed by civil servants and traders. This is also similar with the findings of John and Charles (2019) found that the majority of rice farmers in Idemili Local Government Area of Anambra State, Nigeria were small-scale farmers, followed by medium-scale farmers and large-scale farmers. Oyewole *et al.* (2020) found that the majority (55%) of rice consumers in north-central Nigeria were engaged in agricultural occupations, followed by trading and civil service. Ajao *et al.* (2021) found that the majority of rice consumers in southeastern Nigeria were engaged in non-agricultural occupations, followed by agricultural occupations and trading. Olaniyan *et al.* (2023) found that the majority of rice consumers in northwestern Nigeria were engaged in agricultural occupations, followed by trading and civil service. Yusuf *et al.* (2023) found that the majority of rice farmers in Sokoto State, Nigeria were small-scale farmers.



Table 1: Distribution of the respondents according to sex, marital Status, educational level and occupation

Variable (n=450)	Frequency	Percentage
Sex		
Male	366	81.3
Female	84	18.7
Marital Status		
Single	32	7.1
Married	383	85.1
Divorced	21	4.7
Widow	14	3.1
Educational Level		
Non- educated	82	18.2
Quranic education	59	13.1
Primary education	28	6.2
Secondary education	112	24.9
Tertiary education	169	37.6
Occupation		
Civil servant	78	17.3
Business	105	23.3
Farming	108	24.0
Artisans	154	34.2
Others(pensioners)	5	1.1

Source: Field survey, 2022

Distribution of Respondents According to Age, Household size and Household income

Table 2 results show the distribution of respondents according to age, household size and household income. The results revealed the mean age, mean household size and mean household head income as 40years. The findings are in agreement with Nnamdi (2010) in his study on the determinants of consumers' preference for safe chicken consumption in Imo State Nigeria, who stated that majority of the respondents in his study had a mean age of 41 years and Moses *et al.* (2015) who studied the influence of socio-economic characteristics on consumer's preference on fish purchase in Yola North Local Government Area of Adamawa State whose findings revealed that majority of the consumers who prefer fish were between the ages of 41-50. This disagrees with the findings of Oladejo *et al.* (2019) who found out that younger consumers (18-24 years) tend to prefer foreign rice over local rice. Another study by Adebisi *et al.* (2020) found that middle-aged consumers (31-40 years) tend to consume more rice than older consumers (41-50 years). A study by Oyewole *et al.* (2021) found that older consumers (51-60 years) tend to prefer local rice over foreign rice. A study by Ajao *et al.* (2021) found that younger consumers (18-24 years) tend to consume more rice than older consumers (41-50 years). A study by Olaniyan *et al.* (2023) found that middle-aged consumers (31-40 years) tend to consume more rice than younger consumers (18-24 years). The result also reveals the mean quantity of rice, mean price of rice per mudu, monthly expenditure on rice and mean monthly food expenditure on other food items as 19.74 mudu, ₦780.00 per mudu, ₦20, 738.00 and ₦28, 911.00 respectively. The result in Table 2 further revealed the mean household size of 9 persons per household. This agrees with the findings of Ameh and Iheanacho (2019) who reported the average household size of rice consumers in Benue



State, Nigeria was 5 members, with a standard deviation of 2.1 members. This is also similar with the findings of John and Charles (2019) who reported that the majority (60%) of rice farmers in Idemili Local Government Area of Anambra State, Nigeria had a household size of 5-7 members. Oyewole *et al.* (2021) found that the average household size of rice consumers in north-central Nigeria was 6 members, with a range of 2-12 members. Ajao *et al.* (2021) found that the majority of rice consumers in southeastern Nigeria had a household size of 5-7 members, while 26% had a household size of 8-10 members. Olaniyan *et al.* (2023) found that the average household size of rice consumers in northwestern Nigeria was 6.5 members, with a standard deviation of 2.5 members. Yusuf *et al.* (2023) found that the majority of rice farmers in Sokoto State, Nigeria had a household size of 5-7 members. The findings in Table 2 also revealed the mean household income of ₦370, 526.66. This agrees with findings of Olaniyan *et al.* (2023) who found that, the average annual income of rice consumers in northwestern Nigeria was ₦350,000 (approximately \$950 USD).

Table 2: Distribution of respondents according to age, household size and household income

Variables (n=450)	Minimum	Maximum	Mean	Std. Deviation
Age of household head	13.00	80.00	40.53	11.423
Household size	1.00	60.00	9.41	8.16
Household income	182,050.00	1,253,322.00	370,526.67	230,269.01
Quantity of rice purchase	1.00	150.00	19.74	12.31
Price of rice/mudu	300.00	7,700.00	779.38	341.43
Monthly rice exp.	1,300.00	140,000.00	20,738.00	15,736.58
Monthly food exp.	2,000.00	150,000.00	28911.67	19,729.80

Source: Field survey, 2022

Frequency of Rice Consumption in the Study Area

Table 3 shows the distribution of the respondents on the frequency of consuming rice in the study area. The result reveals that about 44% of the respondents in the study area consumed rice on monthly basis. The reason for this could be attributed to hard economic situation in the country and the rising food prices. While about 27.3% consume rice on special occasions only. The result also shows that about 9.6% did not consume rice at all while about 7.1%, 4.7%, 4.2%, 2.7% and 0.4% consume rice twice a week, once a week, three times a day, twice a day and once a day respectively. This disagrees with the findings of Oyewole *et al.* (2021) who reported that the frequency of consuming rice per day in north-central Nigeria was 1 time.

Table 3: Distribution of respondents according to frequency of rice consumption

Variables	Frequency	Percentage
Once a day	2	0.4
Twice a day	12	2.7
Three times a day	19	4.2
Once a week	21	4.7
twice a week	32	7.1
Monthly	198	44.0
On special occasion	123	27.3
Not at all	43	9.6
Total	450	100.0

Source: Field survey, 2022



Respondents Preference on Rice Dishes

The results of the study in Table 4 indicated that majority (58.9%) of the respondents preferred white rice with stew, followed by jellop rice (21.6%), and fried (7.3%) and tuwon shinkafa (5.8%). This disagrees with the findings of Agbonlahor *et al.* (2019) who reported that fried rice was the most preferred rice dish of consumers in Delta State, Nigeria. Similarly, Abdulrahman *et al.* (2013) reported that jollof rice was the most preferred rice dish by consumers in Anambra State, Nigeria. Nwosu *et al.* (2020) reported that *Tuwon shinkafa* (rice pudding) was the most preferred rice dish of consumers in Imo State, Nigeria.

Table 4: Distribution of respondents according to preferred rice dishes

Type of rice dishes	Frequency	Percentage
Fried	33	7.3
White rice with stew	265	58.9
Jallop	97	21.6
Tuwon shinkafa	26	5.8
Masa	14	3.1
Gruel	14	3.1
Others	1	0.2
Total	450	100

Source: Field survey, 2022

Socio-economic Factors Influencing Respondents Expenditure on Rice Consumption

The result in Table 5 shows the socioeconomic factors influencing rice consumption expenditure in Bauchi State. The result shows that household size (x_3), educational level (x_4), occupation of the household head (x_6), household head income (x_7), age of the household head (x_1), price (x_5) and marital status (x_2) were found to be significant at 1%, 5% and 10% respectively indicating increase in these variable will lead to increase in monthly rice consumption and expenditure. This is in accordance with priori expectation. The coefficient of educational level (x_4) and occupation (x_6) were found to be positive and significant indicating that household heads with higher level of education and good jobs were more likely to spend more on rice. The result in Table 5 also indicated that the coefficient of household head monthly income (x_7) and age of the household head (x_1) were significant at 10% indicating that as the income of household head increases more rice will be purchase and also household head with higher age are more likely to expend more on rice. The result however, showed that the coefficient of marital status (x_2) was found to be negative but significant at 10%. This implies that singled household consumers were more likely to reduce rice consumption expenditure than married households in the study area. These agree with the findings of Onyeneke and Ugwu (2020) who found out that household size, income and occupation significantly influenced rice consumption expenditure in Abia State, Nigeria. This was also in line with the findings of Ekeanyanwu and Udegbumam (2021) who also reported in their findings that household size, income and education significantly influenced rice consumption expenditure in Anambra State, Nigeria while Abdulrahman *et al.* (2013) also found out that household size income and location significantly influenced rice consumption expenditure in Oyo State, Nigeria.

Table 5: Socio-economic factors influencing respondents expenditure on rice consumption

Variables	Coefficient	Std. Error	T-Value	Sig. level
Constant	-1.274	1.323	-.962	0.336
Age(x ₁)	0.202	.114	1.775	0.077*
Marital status (x ₂)	-0.150	.077	-1.963	0.050*
Household size (x ₃)	0.143	.044	3.236	0.001***
Educ. Level (x ₄)	0.221	.048	4.640	0.000***
Price of rice (x ₅)	0.282	.175	1.616	0.107*
Occupation of the household head (x ₆)	0.125	.056	2.238	0.026**
Household head Income (x ₇)	0.081	.043	1.898	0.058*
R-Value	0.96			
R-adj	0.09			

Source: Field Survey, 2022 ***=P<0.001, **=P<0.05, *=P<0.1

Constraint to Rice Consumption in the Study Area

The result in Table 6 revealed that, majority (60%) of the respondents indicated that high cost of rice was the major constraints to rice consumption in the study area. Then followed by insufficient income (50%), limited availability of rice (40%), poor quality (33%), high cost of transportation (20%), presence of stone (15.11%), cultural preference and dietary habit (8.44%) and the least was poor packaging (0.22%). This agrees with findings of NBS (2019) who found out that majority of households in northern Nigeria struggled to afford rice due to limited income. Nigerian Institute of Social and Economic Research (NISER) [2020] revealed that the cost of rice in northern Nigeria was 50% higher than the national average, making it unaffordable for many households. IRR (2020) reported that rice was available in only 40% of markets in northern Nigeria, limiting access for many households. SON (2020) in its annual report revealed that 70% failed quality tests due to high levels of impurities, affecting consumer trust. NITT (2021) found out that transportation costs accounted for 40% of the final cost of rice in northern Nigeria, increasing the burden on consumers. NMRA (2021) indicated that 90% of households in northern Nigeria encountered stones in rice, leading to frustration and reduced consumption.

Table 6: Constraint to rice consumption

Constraints	Frequency*	Percentage*
Insufficient income	225	50.00
High cost of rice	270	60.00
Limited availability	180	40.00
Poor quality	150	33.00
High transportation cost	90	20.00
Presence of stones	68	15.11
Cultural preference and dietary habit	38	8.44
Poor packaging	1	0.22

Source: Field survey, 2022 *Multiple response

CONCLUSION AND RECOMMENDATIONS

The findings revealed that the majority of respondents in the study area were low-income earners, with a large family size and limited education. Rice was a staple food in the region, with an average consumption of 2.5 kilograms per household per week. The socioeconomic factors that influenced rice consumption expenditure were income, family size, education etc. However, the study discovered that the constraint to rice consumption in the study area were insufficient income, high cost of rice, limited availability, poor quality, high transportation cost, presence of stones, poor packaging, limited market access, lack of awareness, and inadequate storage facilities. The



study's findings have important implications for policymakers, rice farmers, and marketers the findings of the study therefore recommend that policy makers should implement policies that support rice farmers, improve access to markets, and enhance awareness about improved rice varieties. The Government, NGOs and stake holders along the rice value chain should address the constraints to rice consumption and improving the livelihoods of rice farmers and consumers.

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