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RESEARCH ARTICLE

CONSUMERS' PREFERENCE FOR LOCAL RICE BRANDS IN IBADAN METROPOLIS, NIGERIA

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ABSTRACT

Despite a self-sufficiency in rice production in Nigeria, there is a huge supply deficit of local rice, which is augmented by importation. This shows a low demand for locally produced rice and a high importation bill for rice. This study therefore assessed consumers' attitude to and preference for locally grown rice in Ibadan metropolis, Nigeria. A multi-stage sampling procedure was used to select three hundred consumers using a questionnaire. Data were analysed using descriptive statistics, Likert scale and double-hurdle regression. Consumers spent about a third (31%) of their monthly food expenditure on rice consumption. Preference for local rice was lower (48%) than imported rice (52%). Cleanliness and absence of stones were major attributes consumers consider when purchasing local rice brands. The attitude towards consumption of local rice was very limited among the consumers. A marginal increase in household expenditure on rice reduces the probability of a consumer's preference for local rice brands. Policy thrusts aimed at mitigating spikes in price of local rice will impact its consumption positively.

KEYWORDS

Consumers' choice, attributes, rice expenditure, urban dwellers, Nigeria.

1. INTRODUCTION

Rice (*Oryza sativa*) is the highest staple food consumed in across cultural, religious, ethnic or geographical boundary with about 85% of households consuming rice, spending an average of 6% of its total income on rice consumption in Nigeria (Isa et al., 2013; Johnson et al., 2013). Production and per capita consumption of rice has been increasing in Nigeria (IRRI, 2016; Ehiakpor et al., 2017). The per capita rice consumption is estimated at 35kg per annum, giving a total of 5.2 million metric tons of milled rice consumed in Nigeria per annum (Gyimah-Brempong et al., 2012). However, owing to its increasing contribution to the per capita calorie consumption of Nigerians with increasing population growth and income level, the demand for rice has been increasing at a much faster rate than domestic production and more than in any other African countries since mid-1970s (Bamidele et al., 2010; BERNAS, 2015). The high level of rice consumption suggests that increased production of local rice will improve the food security situation since it will be available at affordable prices and also lead to higher incomes and improved welfare for farmers (Diako et al., 2010).

Nigeria is the largest producer of rice(paddy) in Africa producing about 55% of total rice production in Africa and ranked as the 14th largest producer of rice in the world as of 2019 (KPMG, 2019). According to Index Mundi statistics report, the production of paddy and milled rice in Nigeria was estimated to amount to five and nine million metric tonnes, respectively but imported about two million metric tonnes in 2021. Despite the self-sufficiency in rice production, about 57% of the 6.7 million metric tonnes of rice consumed in Nigeria annually is locally produced, leading to a supply deficit of 2.88 million metric tonnes, which is augmented by importation. Nigeria has been a major consumer and the second largest rice importer in Africa with a huge import bill of over N356 billion on yearly importation of rice, out of which about N1 billion is used per day (USDA, 2019). Thus, increasing preference for local rice should be an important policy thrust, in order for the Nigerian government to resolve the demand-supply gap for rice.

In a bid to address the demand-supply gap of rice in Nigeria, government had at various times come up with policies, programmes and institutes such as the Federal Rice Research Station (FRRS), established in 1970; National Accelerated Food Production Project (NAFPP), established in 1972; the National Cereals Research Institute (NCRI), launched in 1974; World Bank-Assisted Development Programs, set up in 1975; Operation Feed the Nation (OFN), which started in 1976; the River Basin Development Authorities (RBDs), established in 1977; and Abakaliki Rice Project (ARP), established in 1978 and in recent times, the Presidential Initiative on Rice (PIR), established in 1999; the National Program for Food Security (NPFS); the National Rice Development Committee(NRDC) in 2003; National Fadama Development Project (Fadama I: 1993-2002; Fadama II: 2005-2009; Fadama III: 2009-2013; Fadama III-AFI & II:2013-2016); and the National Rice Development Strategy (NRDS) established in 2009.

Rice was also one of the selected crops under the Agricultural Transformation Agenda (2011-2015). Successive governments have designed policies to encourage the cultivation and consumption of locally produced rice, but most of these policies have been largely inconsistent and ineffective (Okodua 2017). However, Nigeria currently doubles as the largest rice producer and the largest importer of rice in the Africa. There is therefore a huge market for local rice production in Nigeria. Thus, the issue of local rice production and consumption in Nigeria is now an important goal in order for the government to resolve the demand for rice

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through self-sufficiency. Continuous rice importation and high cost of rice production will worsen the standard of living of small holder rice farmers (Asiru et al., 2018). The inability of Nigeria to match the exponential growth in demand with production suggests serious negative consequences for food security, income levels and poverty reduction.

Consumers' preference for local rice determines its demand (Ajayi and Ajiboye, 2020). Rice grain quality has become very important among Nigerians, as quality preferences vary among ethnic groups and the preparation to which rice will be subjected. A combination of factors seems to have triggered the structural increase in rice consumption over the years with consumption broadening across all socio-economic classes, likewise rising demand for rice is also a result of increasing population growth and income level (Basorun, 2013). Owing to a large percentage of foreign matter and low levels of postharvest grading and sorting, 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 in this convenience dimension (Demont et al., 2013).

This explains critically, reasons why imported rice is preferred in many countries to local producing rice, with Mali, Gambia and Guinea as exceptions (United State Agency for International Development. (FAO, 2000, FMARD, 2012). Several factors have been attributed for this preference such as its taste, neatness, quick cooking potential unlike the local rice (Odusina, 2008). Emodi and Madukwe reported that households are dissatisfied with local rice bought in the market and are weary of picking stones from the local rice and having to wash it several times (Emodi and Madukwe, 2011). However, despite the price and quality differential, there is still an overall acknowledgment of higher organoleptic properties of local rice (Lancon et al., 2003). Urbanisation has also increased the level of rice consumption, because its consumption is linked with quick and prompt preparation for the working class and urban dwellers, and it is also linked with fast food joints and partying in many homes (Rutsaert et al., 2014).

Consumers' preference for rice variety traits is pertinent for agricultural technology adoption because consumers derive utility not from goods themselves but from the attributes they provide (Lancaster, 1996). Accordingly, this implies that consumers are maximizing their household utility by consuming their preferred variety attributes not by directly consuming the varieties embedding those preferred attributes. Therefore, understanding Consumer's variety attribute preferences will be useful to predict the likelihood of survival of varieties embedding those attributes (Enneking et al., 2007). A better understanding of consumer preferences for local rice is also needed to understand the rice value chain and facilitate rice market development in Nigeria. Better information for rice producers will assist them in making better decisions to produce appropriate rice qualities and maximize their returns (Kinsey, 2010). The outcome of this study could help policymakers and marketers to make more informed decisions about consumer response to some important attributes and promotion of locally grown rice. It can also guide promotion investment decisions and efficient fund allocation. For producers, the information contained in this study may help in selecting most profitable marketing strategies. Also, it can help to build producers' knowledge and develop capacities which will help in achieving food and nutritional security which is the second of the Sustainable Development Goals.

Previous studies on rice have focused on identifying the constraints to increasing domestic rice production in Nigeria while other studies have focused on explaining the growth of rice consumption (Ogundele, and Okoruwa, 2006; Adeyeye 2012; Oyinbo et al., 2013; Adeyeye et al., 2011; Alfred and Adekayode, 2014). Other studies assessed consumers' preference for local rice in rice producing areas of Nigeria (Ogundele, 2014; Onu, 2018; Ekanem et al., 2020; Ajayi and Ajiboye, 2020). Ogundele which may not represent the consumers' preference in non-rice producing areas in Nigeria, especially in urban Southwest Nigeria (Ogundele, 2014). Furthermore, none of these studies considered selectivity bias in the model used, which was corrected for using the double hurdle model. The study therefore assessed consumer preferences for local rice among urban households in Ibadan Metropolis, Oyo state.

2. MATERIALS AND METHOD

The study was carried out in is Ibadan Metropolis, which is the largest city in West Africa, consisting of five Local Government Areas (LGAs), namely Ibadan North, Ibadan Northwest, Ibadan Southwest, Ibadan Southeast and Ibadan North East LGAs. A multistage sampling technique was used in selecting three hundred respondents. The first stage was the purposive selection of Ibadan North LGA, which is the most populated in the state and the largest land area among the urban LGAs in Nigeria with a land area of about 2633199 m^2 and a population of about 306,795 at the 2006 census (Nigerian Population Commission-NPC-, 2009). The second stage was the random selection of four wards from the twelve wards in the LGA. The third stage was the random selection of 75 respondents from each of the four wards. Thus, a total of three hundred respondents were selected. Data were collected with the use of a structured questionnaire provided information on respondents'socioeconomic characteristics, consumption and preference for local brands consumed and attributes considered most important.

Data were analyzed using descriptive statistics (such as mean, frequency, tables and percentage), Double hurdle model and Likert scale. Descriptive statistics were used to profile the socio-economics of rice consuming households. The Likert scales (Likert 1932) measure attitudes by presenting a set of statements and asking the respondent to indicate their level of agreement or disagreement with each statement by selecting from a fixed scale of responses. When responding to a Likert item, respondents specify their level of agreement or disagreement on a symmetric agree-disagree scale for a series of statements. Thus, the range captures the intensity of their feelings for a given item (Burns and Burns, 2008). The Mean Score (MS) is obtainable by summation of the product of rating points and observation divided by the total number of sample size. It is expressed as:

Weighted scores = sum of frequency (most important to not important)
Total number of respondents
Mean score = sum of weighted scores
Total number of respondents

2.1 Model Specification

The double-hurdle model, originally formulated by assumes that households make two decisions with regard to purchasing an item, each of which is determined by a different set of explanatory variables (Cragg, 1971). In order to observe a positive level of consumption, two separate hurdles must be passed. This method provides a general approach to modelling participation and expenditure decision as two-stage decision process. The model allows dealing with the censoring problem and model the decision process in two steps. Households are assumed to first decide if they buy or not a positive quantity of the good (participation decision) and then decide the optimal amount to buy (quantity decision). Yen has argued that, when carefully interpreted, the probability of consumption in the double-hurdle model also reflects the probability of purchase, and therefore, the double-hurdle model is also appropriate in modeling demand relationship with zeros resulting from infrequency of purchases (Yen, 1993).

Therefore, it has the advantage that it permits the joint modeling of the decision to consume and the expenditure decision (the amount spent) on a particular commodity (Yen and Huang, 1996). In this model, individuals should pass two-step decision processes. First, they decide to consume local rice market and decide the amount of their income to be spent on local rice at a prevailing market price. In other words, if zero amount is observed to be spent by an individual, it is either because of the preference decision or the expenditure decision (not spending any amount), or both. The model works under the assumption that there exist two latent variables: γ_1^{**} related with the individual's decision to participate in the local rice consumption and γ_2^{**} with his decision on the amount to be spent on the commodity (Akinbode and Dipeolu, 2012). These latent variables are expressed as linear functions of the first and second hurdle regressors, $X_1$and X_2, respectively:

$\gamma_1^{**} = \chi_{1\beta 1} + \mu_1$ ..... Preference decision for local rice (1)

$\gamma_2^{**} = \chi_{2\beta 2} + \mu_2$ ..... Expenditure on local rice (2)

Where X_1 represents the regressors used to explain the preference decision in equation (1) and X_2 those used to explain the expenditure decision for local rice in equation (Description in the Appendix). Suppose that an index variable $\gamma_1^*$is expressed as γ_1^* =1 if the individual prefers local rice and γ_1^* =0, otherwise, then we have: γ_1^* =1 if $\gamma_1^{**} > 0$ γ_1^* =0, if otherwise Assuming that the error term μ_1 in equation (1) is normally distributed, the first hurdle corresponds to a Probit model. Similarly, turning to the expenditure equation, provided that the first hurdle was cleared, γ_2^*can also be generated as:

$\gamma 2* = \gamma 2**, if \gamma 2** > 0, and$

$\gamma_2^{**} = 0, if otherwise$

The inverse Mills ratio (λ), the error from the probit equation explaining selection, was estimated based on the probit regression results. In the second step, the inverse Mills ratio was included in the multiple regression

analysis as an independent variable, and ordinary least square is used to provide the consistent parameter estimates. This second hurdle takes the form of truncated regression and is capable of generating zero levels of expenditure, independent of the first hurdle. Finally, the observed (actual) amount spent on local rice, γ, is determined by the interaction of both hurdles, that is: $\gamma = \gamma_1^* \gamma_2^*$

The double-hurdle model specification assumes a bivariate normal distribution (BVN) of latent variables given as:

$$(\mu_i) \sim BVN\ [0, (\sigma\mu^2 \quad \rho\sigma\mu)] \qquad (3)$$
$$v \qquad \rho\sigma_\mu \qquad 1$$

3. Results and Discussion

A larger percentage (51.7%) preferred imported rice to local rice (Figure 1). This is consistent with the findings that consumers preferred imported rice to Nigerian rice in Imo State, Nigeria (Onu, 2018).

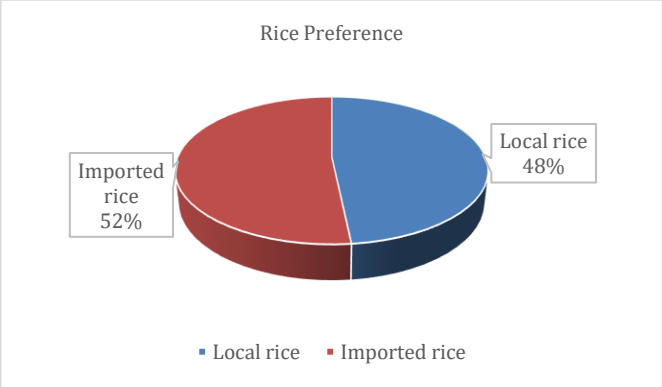

Figure 1: Distribution of consumers by rice preference

In addition, a lower percentage of consumers that preferred local rice (43. 5%) and imported rice (43.9%) were male (Figure 2). This implies that more females than males were involved in the patronage of rice in the study area. This conforms to the assumption that the decision of household food consumption is mostly done by the females. It also corroborates the findings of that sex of consumers influences consumption of local rice (Basorun, 2009).

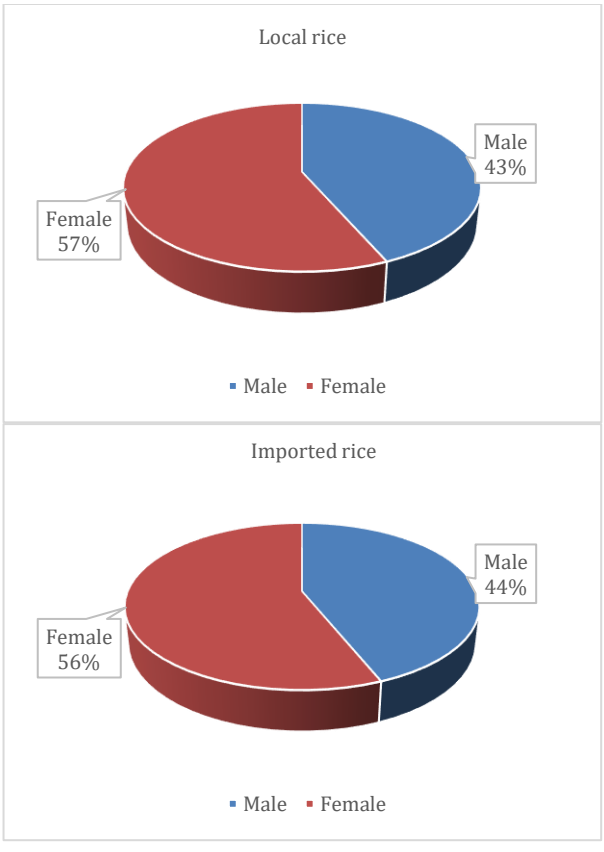

Figure 2: Distribution of consumers by sex

The age distribution showed that the highest proportion of the respondents (64.3%) were of 30 to 49 years old and only 8.3% were more than 60 years (Table 1). The mean age was 37, which shows that majority of the respondents were in their active working age and were matured enough to make an informed decision on their preference and expenditure on rice in the study area. A larger percentage of the consumers with preference for local (74.5%) and imported (67.7%) rice consumers were married, implying that the unmarried consumers preferred imported rice compared to the married consumers. Moreover, 93.4% of the respondents had at least secondary education while only 6.6% had primary education. Furthermore, 45.5% and 57.4%) of the respondents of local and imported rice consumers had tertiary education, implying that consumers with high educational attainment preferred imported rice to local rice. According to a report by the attainment of education plays a key role in the consumption of locally grown foods (FAO, 1999). This finding also agrees with that of that household heads with tertiary education (34%) constituted a larger proportion of the rice consuming households in a similar study (Okidim, 2012). Additionally, the highest proportion of the patrons of local (57.2%) and imported (40.7%) rice patrons had four to six household members with total mean score of four members. This implies that larger households consume local rice in the study area.

Table 1: Distribution of Respondents' Demographic Characteristics

Demographic	Local Rice Preference		Imported Rice Preference	
Variables	**Frequency**	**Percentage**	**Frequency**	**Percentage**
Age				
20-29	14	9.65	20	12.90
30-39	38	26.20	58	37.42
40-49	54	37.24	43	27.74
50-59	27	18.62	21	13.55
60-69	9	6.21	11	7.09
70-79	3	2.07	2	1.29
Mean (SD)	37 (9.39)			
Marital status				
Single	22	15.17	44	28.39
Married	108	78.48	105	67.74
Divorced	5	3.45	4	2.58
Widowed	10	6.89	2	1.29
Education level (years of formal education)				
(≤ 6) Primary	12	8.28	8	5.16
(7-12) Secondary	67	46.21	58	37.42
(> 12) tertiary	66	45.52	89	57.42
Household size				
1-3	33	22.76	71	45.80
4-6	83	57.24	63	40.65
7-9	23	15.86	19	12.25
> 9	6	4.14	2	1.29
Mean (SD)	4(2.1)			

Furthermore, a larger percentage of the rural respondents were primarily traders representing 19.3% and 16.0% of local rice patron and imported rice consumers respectively (Table 2), indicating that trading is the predominant occupation in the study area. The mean household total expenditure was ₦7,519.79. The highest proportion of consumers who preferred local rice (39.3%) and imported (35.5%) rice respectively ₦5,00.00-10000.00 in a month. The households monthly budget share on rice for the aggregated households of the study was 0.319 which indicates that the aggregated households spent 31.9% of their monthly food expenditure on rice consumption. The largest proportion of local (24.1%) and imported (27.7%) rice patrons spent about 40-50% of their total household food expenditure on rice consumption every month. As income increases, quantities demanded of a commodity is also expected to increase or decrease depending on the nature of the commodity. An increase is expected for a normal good and a decrease for an inferior good. This agrees with the findings of that the high demand for rice in Nigeria could also be attributed to increased income levels (Akande, 2001).

Table 2: Distribution of Household Economic Characteristics

	Local Rice Preference		Imported Rice Preference	
Economic Variables	**Frequency**	**Percentage**	**Frequency**	**Percentage**
Major source of income				
civil servant	13	8.96	28	18.06
artisan	40	27.58	37	23.87
trading	58	40	48	30.97
private salary earner	23	17.93	35	22.58
farming	4	2.76	2	1.29
others	4	2.76	8	5.16
Household total expenditure (₦)				
1000-5000	46	31.72	47	30.32
5001-10000	57	39.31	55	35.48
10001-15000	31	21.38	33	21.29
15000-20000	13	5.52	14	9.03
>20000	3	2.07	5	3.22
Mean (SD)	7519.8 (4182.13)			
Share of rice on food expenditure (%)				
1-10	9	9.65	21	13.54
11-20	31	21.38	39	25.16
21-30	25	17.24	41	26.45
30-40	26	17.96	15	9.67
40-50	35	24.14	43	27.74
Mean (SD)	32 (0.27)			

3.1 Attributes that Consumers Consider when Purchasing Rice

The major factors influencing consumers' preference for local rice among the respondents were absence of stones (stone free), cleanliness, taste, and dryness of the rice (Table 3). Stone free was the utmost factor influencing household preference for local rice in the study area. consumers are dissatisfied with Nigerian rice bought in the market and are weary of picking stone from Nigerian rice and having to wash it several time (Emodi and Madukwe, 2011). Aroma of rice was considered the least important attribute. This finding corroborates findings that rice attributes such as flavour and aroma, taste, price, and location (area of rice production) also affect the consumers' choices of the brands available in the market (Gunaratne and Walisinghe, 2012). It is also consistent with the findings of that both cooked and zero attribute of rice influence consumer preference, the appearance of raw rice, taste, texture and aroma, grain size, absence of white specks, Uniformity of grain, absence of foreign matters such as stones was critical to consumers' choice (Diako et al., 2010).

Low price of rice is one of the minor factors influencing household preference for local rice among the respondents and this is in agreement with the findings of that consumers prefer and can afford to pay for high quality imported rice in contrast to domestic rice brands which are considered to be of poor quality because they often contain dirt, stones, chaff and large quantity of broken or irregular grains and so lack competitive advantage against the imported rice brand (Abdul et al., 2017). Also, the findings of the study are similar to the findings of that consumers prefer and can afford to pay for high quality imported rice in contrast to domestic rice brands which are considered to be of poor quality because they often contain dirt, stones, chaff and large quantity of broken or irregular grains and so lack competitive advantage against the imported brand (Abdul et al., 2017; Onu, 2018).

Table 3: Relative importance rankings for rice attributes

Attributes	Very important	Important	Least important	Not important	Mean score	Rank
Low price	136	93	36	35	3.1	6
Aroma	92	125	49	33	2.91	7
Cleanliness/neatness	205	80	13	2	3.63	2
Ease of preparation	117	127	38	18	3.14	5
Taste	183	105	8	4	3.57	3
Dryness	151	119	21	9	3.37	4
Stone free	233	53	4	10	3.70	1

Note: Mean importance is calculated with the values of 1 for most important and 7 for least important. Hence, a lower mean indicates a greater importance.

Imported rice was the most preferred while Ofada rice was ranked second. Other prominent and preferred local rice were Abakaliki and Ilesha rice was ranked (Table 4). This agrees with the findings that local consumers have developed preference for imported rice based on the fact that they perceive its quality to be superior to domestic rice (Demont et al., 2011; Ekanem et al., 2020).

Table 4: Relative Preference Rankings for Rice Brands

S/N	Rice brands	Mean rank	Rank
1	Lake rice	2.61	5
2	Ofada rice	4.19	2
3	Ilesha rice	2.92	4
4	Bida rice	2.33	6
5	Abakaliki rice	3.91	3
6	Igbemo rice	1.92	8
7	Ekpoma rice	1.93	7
8	Imported rice	6.32	1
9	Branded local rice	1.03	9

Furthermore, most of the respondents are regular consumers of rice (Table 5). With 10.7% of the respondents consuming rice at least once a week, 24.8% consumed rice three times in a week, while 20.3% consumed rice 2 times a week. Majority (32.4%) of the respondents consumed rice every day. This indicate that as a human food, rice continues to gain popularity in many parts of the world where other coarse cereals, such as maize, sorghum and millet, or tubers and roots like potatoes, yams and cassava have traditionally dominated (Chang, 1985). The least proportion (2.78%) of the respondents preferred to purchase rice from supermarket rather than the retail market (52.7%), and wholesale market (38.89%). It was due to the location of these stores that were proximate to their homes and the availability of various kinds of products which gave them more options and greater choices.

Table 5: Distribution of Respondents by Rice Consumption Pattern

Variable	Frequency (n=300)	Percent (%)
Frequency of eating rice		
Daily	94	32.41
Twice a week	59	20.34
Thrice a week	72	24.83
Once a week	31	10.69
Once in a month	17	5.86
Others	17	5.86
Location of purchase of rice		
Retail market	152	52.78
Wholesale market	112	38.89
Supermarket	8	2.78
Hawkers	16	5.56

3.2 Factors influencing consumers' preference and expenditure for local rice

The double hurdle Heckman selection model was fitted using the two-staged procedure namely the preference for local rice and the expenditure on local rice (Table 6). Wald's test was significant, suggesting that the model has a good fit. The Inverse Mills Ratio (IMR) was negative and insignificant which shows that there was no selection bias being corrected for in the two estimates. The finding showed that the age of household head, age squared, total expenditure, availability and frequency of consumption significantly influence household preference for local rice in the study area. Household size and primary occupation significantly influence household expenditure on local rice in the study area.

The estimated coefficient of household head's age was positive suggesting that any unit increase in the age of the consumers' age would lead to a corresponding increase in consumers' preference for local rice brands by a magnitude of 0.0513 unit. Thus, an increase in age may not enhance increase in preference for local rice. Conversely, the estimated coefficient for age squared was negative indicating that a unit increase in age squared has the probability of reducing preference for local rice by a magnitude of 0.0005 unit. This finding also implies that older people spend less on local rice. The positive and negative significance of age and age squared, respectively, imply that the elderly have a higher preference for local rice brands than the younger consumers. This could be because elderly people have less energy to go through rigorous process of selecting, removing debris and sieving the rice and as such would spend more on imported rice with no impurities and less stress in cooking. This corroborates with the findings of that youths consume more of imported rice than local rice due to the prestige that is usually associated with the former (Ogundele, 2014; Dennis et al., 2017).

Table 6: Estimated Result of the Double Hurdle Model for Consumption of Local Rice

	First Hurdle: Preference Decision		Second Hurdle: Expenditure Decision	
Variables	**Coefficient**	**Std Error**	**Coefficient**	**Std Error**
Age	0.0513**	0.0236	-0.1950	0.1708
Age-squared	-0.0005*	0.0003	0.0026	0.0022
Years of Formal Education	0.0055	0.0114	0.0466	0.05389
Household Size	0.0193	0.0195	-0.1410*	0.0772
Primary Occupation	-0.0087	0.0314	-0.2599**	0.1174
Non-food Expenditure	3.88e-06	3.17e-06	-2.37e-04	2.03e-04
Household Total Expenditure	-4.50e-06*	2.58e-06	2.57e-04	1.73e-04
Availability	-0.1747***	0.0547	-0.0352	0.2637
Frequency of Consumption	-0.0570***	0.0208	0.0526	0.1191
Stone-free	0.0581	0.0606	-0.2905	0.1862
Constant	-0.3085	0.4939	5.7464	3.3867
Inverse Mills Ratio	-0.4134	0.6097		
Rho	-0.8489			
Sigma	0.4870			

Observation=276. Wald chi2(10) =39.16***

***, **, * represent significance at 1%, 5% and 10% respectively.

Household total expenditure had a negative relationship with the preference for local rice brands suggesting that a naira increase in household expenditure reduced the probability of a consumer's preference for local rice brands marginally by -4.50×10^{-06} unit. This corroborates with the findings of who noted that increasing expenditure was associated with a reduction in switch from imported to local rice (Ayanwale, 2014). This may be due to the fact that higher expenses would reduce food consumption since the total expenditure comprises expenditure on food and non- food items. The coefficient for availability of local rice was negative indicating that an increase in availability of local rice is likely to reduce the probability of consumers' preference for local rice brand by a magnitude of -0.1747 units in the study area. This result is expected especially if the quality of local rice in the market is low. Such a commodity is referred to as a 'giffen' good. The coefficient of frequency of consumption was also negative, implying that a unit increase in frequency of consumption of rice reduced probability of consumers' preference for local rice by 0.0570 units. This result is in line with the findings of who found that household prefer imported to Nigerian rice due to its cleanliness, texture and swelling capacity (Oyinbo et al., 2013; Abdul et al., 2017).

Being engaged in farming was negatively related to consumers' expenditure on local rice. Thus, an increase in the primary occupation of the household head has the probability of resulting into a reduction in expenditure on local rice by 0.2599 units. Similarly, the coefficient of household size was negative for consumers' expenditure decision on local rice. An additional membership increase in household size may likely make potential expenditure on local rice dwindle by 0.1410 units. This implies that families with larger household size spent less on local rice. This corroborates with the findings of that an inverse relationship could have resulted from the perceived difficulty in preparation of local rice and its consumption due to stress involved in its preparation as the members of mouth to feed increases in southwest, Nigeria (Ayanwale, 2014; Ajiboye et al., 2019).

4. Conclusion

This outcome of this study will enable managers, executives and stake holders involved in rice value chain understand consumers' attitude towards locally produced rice. Results showed that consumers have preferences and attributes they look out for before purchasing a particular brand of local rice. Some of these attributes are absence of stones, cleanliness and taste. Thus, attention should be paid to these attributes by producers, processors and other stakeholders involved in local rice brands production and marketing, in order to enhance increased patronage of local rice. Elderly consumers had a higher preference for local rice brands than the younger consumers and a marginal increase in household expenditure reduced the probability of a consumer's preference for local rice brands. Thus, any policy thrust aimed at mitigating spikes in price of local rice will impact its consumption positively, especially among the elderly consumers. Future studies could investigate the demand and expenditure elasticities for local rice in Nigeria.

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APPENDIX

Table of a priori Expectation

Variable	Description of variables
Age	Age of respondents in years
Sex	Sex of respondents 1=male, 0 if otherwise
Marital status	1=married; 0 if otherwise
Years of education	Years of formal education of respondents
Household size	Number of persons in the household
Primary occupation	Respondents type of occupation 1=salary earners; 0=otherwise
Household Expenditure	Household total expenditure in Naira
Availability	1=available; 0 if otherwise
Stone free	1= prefered; 0 if otherwise
Frequency of consumption	Number of times rice is consumed per week