COMPARATIVE ANALYSIS OF FOREIGN AND LOCAL RICE DEMAND IN IKWUANO AND UMUAHIA NORTH LOCAL GOVERNMENT AREAS OF ABIA STATE, NIGERIA

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ABSTRACT

A comparative analysis of foreign and local rice consumption in Umuahia North and Ikwuano local government Areas of Abia state was undertaken in this study. A total of 93 rice consumers were selected using the simple random technique across the two local government areas. Data, which comprised of information on the socio-economic characteristic and other relevant variables of interest, were collected using a well-structured questionnaire and personal interviews. The socio-economic characteristics were analyzed using descriptive statistics such as percentages and frequencies. The ordinary least square (OLS) multiple regression model was used to analyze the consumption functions of rice consumers. Also F –ratio as postulated by Chow was used to estimate the difference between foreign and local rice consumption. From the results obtained, the price of commodity (X_1), price of substitute (X_2), monthly income (X_3) frequency of consumption (X_5), marital status (X_8), and total expenditure of household heads on other food items (X_9), were significant and are important variables that affected the consumption of foreign and local rice in the study areas. Results showed Price elasticity of demand for rice to be elastic. Also price elasticity of demand for rice substitute is inelastic. More so, income as well as consumption elasticities of demand for rice were inelastic. The economic implication is that rice has become an essential commodity and its demand is not easily affected by fluctuation in price of substitute, income and frequency of consumption in study area. The study also showed that people in the study area consumed more foreign rice than local rice, an indication that foreign rice importation supercedes local rice production. The impact of this is detrimental to the Nation's economy. The government can therefore stabilize her economy by regulating importation of goods and invest more in agriculture so as to encourage indigenous production more local rice of international Market standard. This will help the country meet with status of self-sufficiency.

Keywords: Comparative Analysis, Foreign Rice and Local Rice, Consumption

INTRODUCTION

Consumption pattern and food habits are very dynamic phenomena. Factors like agricultural practices, education, civilization or affluence, economics, ecology, drought and crop failure have influence over what are grown and consumed in Nigerian Communities. Now with affluence and better nutrition education, Nigerian consumers are becoming nutrition conscious and aided by the purchasing power, many of

them particularly those in the cities and peri-urban towns are gradually changing their tradition food habits and taboos. They have shifted their food consumption pattern from old inconsistent pattern to a modern balanced pattern especially as it relates to caloric consumption (Obike, 1999).

The food sub-sector of Nigerian agriculture parades a large array of staple crops. These commodities are of considerable importance for food security, expenditures and incomes of households. Among all the staples, rice has risen to a position of pre-eminence in Nigeria.Also rice is the most important of the World cereals and forms the basis of the diets of millions of people in South Asia, America and Africa (Anyanwu et al 1998).
Rice, once reserved for consumption on special occasions, has grown in importance as a component of Nigerian diets. The average Nigerian now consumes 21kg of rice per year, representing 9% of total caloric intake and 23% of total cereal consumption. Since the mid 1980s, rice consumption has increased at an average annual rate of 11% of which only 3% can be explained by population growth. The remainder represents a shift in diet towards rice at the expense of the coarse grains (millet, sorghum and wheat). An estimated 2.1 million tons of rice are consumed annually (WARDA, 2004).

Nigeria was almost 99% self-sufficient in the rice consumed by its citizens in the 1960s. But from 1970-1980, self-sufficiency declined to 38% leading to demand outstripping supply. To supplement the 62% deficit, the federal government of Nigeria resorted to massive importation of rice. More than 540,000 tonnes of rice were imported in 1983 alone. Per capita income rice consumption rose from 3.5kg in 1970 to more than 14kg in the 1990s. This phenomenon was largely the result of increased per capita income, rapid population growth and changes in the tastes

and diet of Nigerians. The demand for parboiled rice forced the government to commit a staggering 600 million Nigerian invar $(N)^2$ in foreign exchange to milled rice imports in 1985. Understandably, this led to the imposition of a ban on rice imports in October the same year (Imolehin,1991).
Nigeria's rice production in May 2004/05 is forecast at 2.3 million metric tones (MMT), up from 2.2MMT in May 2003/04. The projected increase was based on a combination of improved input supply and favourable weather outlook. The government also promoted the adoption of the new hybrid rice varieties to help boost rice production. These new varieties are high yielding early maturing, disease resistant, and high in protein content. Despite the initiative, however, Nigeria will continue to depend on imports to satisfy a growing consumer demand. Post forecast Nigeria's rice imports in May 2004/05 at 1. 7MMT, up from the revised may 2003 estimate of 1. 6MMT.The projected increase was due to limited supply of locally produced rice and other alternatives such as yams and beans (USDA, 2004).

Significantly variations exist in the type, quality and form of food consumed by people. The variations are usually due to varying levels of education, income, urbanization, and occupation of the household heads (Idachaba 1983,Talira, 1989). However, Olagolie (1983) argued that though education and income affected food consumption pattern, such effect depends more on the social values attached to the food rather than their nutritive values. Tarila, (1989), in his own analysis observed that urbanization, education, income, family size and occupation all affected consumption pattern significantly. Generally, household education is likely to have a positive effect on consumption. Conventionally, the number of years of education per household members i.e. the household head or the mother is used as measure of education. It has been argued that the level of education of the mother is likely to have a positive impact on household food consumption than the level of education of education of the male head of household (Bruck, 2003).

According to Oji (2002), consumer's tastes and preference determines the desirability of rice consumption or otherwise. A favourable change in consumer tastes and preferences for a product implies that more of it will be consumed at each price. And of great importance is the fact that new products, fashion changes which are in vogue and advertising can affect consumers taste. Onyebinama (2000) says a variety of factors, which may be religious, social and cultural influence consumer's taste. The demand for foreign rice which can be considered a "hip" will likely be in the increase while the demand of what is antediluvian will likely decrease. On the other hand, Jhingan (2004) reasoned that when there is a change in the tastes of consumers in favour of a commodity say due to fashion, its demand will rise, with no change in its price, in the prices of other commodities, and in the income of the consumer. On the other hand, change in tastes against a commodity lead to a fall in its demand, other factors affecting demand remaining the same.

Furthermore, Oji (2002), indicated that generally goods in the consumer's basket are related to each other in three basic ways, namely as; substitutes complements and unrelated but competitive. He said those goods that can be used in place of a particular commodity e.g. rice are substitutes to the good in question. Also, those complementary goods are consumed together and as a result are jointly demanded. But he pointed out that unrelated goods, could equally affect the consumption of goods.

METHODOLOGY
A field survey was conducted in Ikwuano and Umuahia North Local Governments Areas of Abia State in 2005 to investigate socio- consumption patterns of foreign and local rice in the study area. The two local Government Areas were purposively selected based on cosmopolitan structure, proximity and low level of rice production in the area. In each LGA, ten communities were selected by simple random sampling technique from the list of all communities in the area. Then in each community, six households were similarly selected by some random sampling technique. Thus 60 respondents were obtained from each LGA and a sample size of 120 respondents for the entire study area. Using structured questionnaires, relevant data on household rice consumption were collected from the respondents. Data were analyzed with both descriptive and the consumption function model of multiple regression statistics.

Consumption Function Model
The multiple regression model used in this work was specified implicitly as;
$Y=f(X_1,X_2,X_3,X_4,X_5,X_6,X_7,X_8,X_9\ldots+e_{ii}$.(1)
Where:
Y= Quantity consumed of foreign and local Rice (kg).
X_1= Price of the commodity.

X_2= Price of substitute.
X_3= Monthly Income.
X_4= Household size.
X_5= Frequency of consumption.
X_6= Level of education of household heads.
X_7= Sex of consumer household heads.
X_8= Marital status of the household heads.
X_9= Total expenditure on other food items.
E_i= Stochastic distribution or error term.
Four functional forms of multiple regression were employed in order select the one that has provided the best fit. The functional forms tried were; linear, double-log (Cobb-Douglass), semi-log and exponential. The choice of the best functional form was based on the magnitude of the R^2 value, the significance, size and the sign of the regression coefficients as they conform to a-priori expectation. The functional forms were specified implicitly as follows:

1. Linear Function:
   $Y=b_0+b_1X_1+b_2X_2+b_3X_3+b_4X_4+b_5X_5+b_6X_6+b_7X_7+b_8X_8+b_9X_9+ei$…… (2)
2. Double-Log Function**:**
   $Ln\ (Y) = b_0 + b_1LnX_1 + b_2LnX_2 + b_3LnX_3 + b_4LnX_4 + b_5LnX_5 + b_6LnX_6 + b_7LnX_7 + b_8\ LnX_8 + b_9\ LnX_9 + ei$…(3)
3. Semi Log Function**:**
   $Y = b_0+b_1LnX_1+b_2LnX_2 + b_3LnX_3 + b_4LnX_4 + b_5LnX_5 + b_6LnX_6 + b_7LnX_7 + b_8LnX_8+b_9LnX_9+ei$…… (4)
4. Exponential Function

   $Ln\ (Y) = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + ei.$(5)

Elasticity
The various elasticities for demand, price, income and consumption are computed by the a representative formula expressed thus;

$$e = \frac{\partial Q}{\partial X}\cdot\frac{\overline{X}}{\overline{Y}}$$

Where:
E=Coefficient of elasticity (for price income and consumption).
Q= the dependent variable in any of the model considered
X= the independent variables in any of the models being considered
$\overline{X}$, $\overline{Y}$ = the mean values of X and Y
To compare consumption patterns of foreign and local and local rice in the study area, the equality between sets of coefficients in the two linear regression model, (for foreign and local rice) is evaluated first by Chow test model (Koutsoyiannis, 1975)
This test answers the questions such as; Are the two estimated functions significantly different?
Does the consumption function shift over time?
Is the difference insignificant, so that it may be attributed to chance, in which case we may conclude that the consumption function is stable over time?
The Chow F-Test is computed using the formula

$$F^* = \frac{\dfrac{\sum e^2 p(\sum e_1^2+\sum e_2^2)]}{K}}{\dfrac{(\sum e_1^2+\sum e_2^2)}{(n1+n2-2k)}}$$

Where:
F*=Critical point of significant difference between two samples.
$\sum e^2 p$ = Pooled residual variance
$\sum e^2_1$ = Residual variance for the foreign rice consumption
$\sum e^2_2$ = Residual variance for the local rice consumption
K = the number of variables including the constant terms
n_1 = the number of observations obtained in the foreign rice sample
n_2 = the number of observations obtained in the local rice sample

The null hypothesis is $b_i - = \beta_i$, that is there is no structural difference in equations obtained from the two samples. We compare the observed F* ratio with the theoretical value of $F_{0.05}$ (or other levels of significant) with $V_1 = K$ and $V_2 = (n_1 + n_2 – 2_k)$ degrees of freedom.

The theoretical value of F is the value that defines the critical region of the test (at the chosen level of significance).If F* > F 0.05, we reject the null hypothesis, that is, we accept that the two functions differ significantly, or the two samples give different relationships. Note this economic relationship studies, changes over time (Koutsoyiannis 2001).

RESULTS AND DISCUSSION

Socio-Economic Characteristics of the Respondents

Majority of the respondents were household decision makers especially in the area of food purchase and consumption, this is without respect to age and sex.

More so, there were more female respondents than male generally, and this implies that women are mostly the household decision-makers with regards to household food consumption in the study area. However, men are also involved in the kitchen affair either because, the man is a bachelor, divorced, a widower or the wife is incapacitated by illness. The respondents cut across all socio-economic boundaries. This includes Urban and Rural dwellers of different occupational educational and socio-economic background.

From Table 1, the largest proportion of respondents (37.6%) was between the ages of 20-39 years, followed by those between 40-59 years. This implies that a large number of the respondents were relatively young. Thus the marginal propensity to consume (MPC) rice is higher with the youths and the middle aged than the ageing household members.

Also, Table 1 indicates that majority (47.3%) of the respondents had 1-5 members in their households, 26.9% had 6-10 members, while 24.7% of the respondents had a large household size ranging from 11 to 15 members. In the study area, the average household size was 7 which suggest a relative high size of households. This also has direct implication for the quantity of rice consumed per day (QCD).The implication is that the household size of the respondents in the area was high and as such; the demand for rice in the households would most likely, go high except for low income earners. Again due to synergies from larger household size, the demand for rice would be high, since they can pull resources together (Quartey, 2005).

The results showed that the largest proportion (43%) of the respondents was married. This was closely followed by widows/widowers who constituted 30% of the respondents while 25% of the respondents were singles/divorced. Cumulatively, 78 respondents had ever married. Thus high propensity for rice consumption could be expected in the study area.

Results in Table 1 showed further that about 54% of the respondents were females whereas the remaining 46% were males. This indicates that there were more female household heads than male headed households in the study area. From Table 1, it was observed that 60% of the respondents attained post secondary education while 20.4% and 19.4% represented those that had secondary and primary education respectively. In this study, educational status which reflects the type of job and standard of living one has, was used as a proxy for occupation of the household heads.

Similarly majority (80.7%) of the respondents consumed rice at least 1-5 times each week while 8.6% consumed the commodity between 6-10 times each week. Cumulatively, 89% of the respondents consume rice between 1-15 times per week. 53 households comprising of 57% of the total respondents consumed foreign rice whereas 40(43%) of the entire households consumed local rice. This implies that, rice is has attained very important position in the food basket of households in the study area.

Foreign Rice Consumption

The OLS regression analysis results for foreign rice consumption are summarized on Table 2 below. The Linear functional form was also chosen as the lead equation because the R square value is highest at 0.977 indicating that 97.7% observed variations in the resultant output are explained by the included variables.

Five of the explanatory variables were significant at 1%. This implies that for any 1% increase in the explanatory variables, there is a commensurate increase in the coefficient of the Y variable.

Specifically, the result of the regression analysis showed that the price of the commodity (X_1), had a strong positive relationship with the quantity of foreign rice consumed which means as the price of the commodity increased, the quantity of foreign rice consumed by the household increased. Here rice is seen to behave like essential commodity but this is contrary to the *a priori* expectation (Onyebinama 2000).
Table 2 also, revealed that the price of substitute (X_2) showed a positive relationship with the quantity consumed of foreign rice. This implies that as the price of substitute increased, the quantity consumed of foreign rice increased and this agrees with a prior expectation.

Similarly, Household size (X_4) was positively related to the quantity consumed of foreign rice which shows that an increase in the household size will automatically bring about an increase in the quantity consumed of foreign rice.

There is also a positive relationship between the frequency of consumption (X_5) and the quantity of foreign rice consumed (y). This is also a major factor explaining the variations in the quantity of foreign rice consumed. There is a significant relationship between the level of education of household heads X_6, and the quantity of foreign rice consumed. The level of education of the heads of households, positively affects the quantity of foreign rice consumed. This positive relationship according to Koskela and Freidman was confirmed by empirical studies (Rossi, 1988; Gupta, 1987; Koskela and Viren, 1992; Avery and Kanniickiel, 1991). The level of education of household heads in the study area was high.

To conclude this section, the results indicated that the major determinants of the consumption function of foreign rice are price of the commodity (X_1), price of substitute (X_2) Household size (X_4), Frequency of consumption (X_5) and level of education of the household heads (X_6).

Local Rice Consumption
The OLS regression analysis for local rice consumption is summarized in Table 3 below. In all the functions, the R^2 value was statistically significant at the 1% level. The R^2 shows how much explanatory variable are the able to explain the variations in the quantity of Local rice consumed in the urban and Rural Areas i.e., Umuahia North and Ikwuano local Government Areas.

The linear form of the functions was chosen as the lead equation because despite the fact that the R square value (0.674) was highest and almost same as that of log (0.675), it had the highest number of significant explanatory variables. The R^2 value further indicates that 67.4% of the observed variations in the resultant quantity consumed are explained by the included variables. The three explanatory variables were significant at 1% each
The result of this regression analysis confirmed the following: that the regression coefficient for price of local rice (X_1) is positive and statistically significant at 1%. This implies that as the price of the local rice commodity increased at 1%, the quantity consumed of local rice also increased by 6.285%. This is not in accordance with *a priori* expectation.

Table 1: Distribution of Respondents according to Age, Household size, Marital and Educational Statuses, Sex, and Frequency of Rice Consumption.

VARIABLES	FREQ.	%	VARIABLES	FREQ.	%
Age(Years)			Marital Status		
20-39	35	37.6	Single	15	16
40-59	30	32.3	Marital	40	43
60-79	16	17.2	Divorced	10	11
80-99	12	12.9	Widow	18	19
Total	93	100	widower	10	11
Household size			Total	93	100
1-5	44	47.3	Sex		
6-10	25	26.9	Male	43	46.3
11-15	23	24.7	Female	50	53.7
16-20	1	1.1	Total	93	100
TOTAL	93	100			
	Educational status			Frequency of consumption	
No Formal Education	0	0	1-5	75	81
Primary school	18	19.4	6-10	8	8
Secondary Edu.	19	20.4	11-15	6	7
Tertiary	56	60.2	16-20	4	4
Total	93	100	Total	93	100
Consumption Status					
Local Rice	40	43			
Foreign Rice	53	57			
Total	93	100			

Source: Field data, 2005.

Table 2: Determinants of Foreign Rice Consumption

Variables	Linear	Double-Log	Exponential	Semi-Log
Constant	-8.013 xxx	-0.321	1.865 xxx	-87.450 xxx
	(-4.671)	(-0.926)	(31.386)	(-3.134)
Price of Commodity	0.004062 xxx	0.310 xxx	0.00005322 xxx	7.329 xx
	(8.168)	(6.785)	(3.062)	(1.988)
Price of substitute	0.0005699 xxx	0.3908 xx	-0.000003652	3.698 xx
	(3.168)	(2.013)	(-0.586)	(2.363)
Monthly Income	-0.207	-0.06706 x	-0.01345	-3.452
	(-0.345)	(1.791)	(-0.646)	(-1.144)
Household Size	0.533 xxx	0.07099 x	0.001502	4.964 x
	(2.601)	(1.983)	(0.211)	(1.721)
Frequency of consumption	0.518 xxx	0.106 xxx	0.008056	6.864 xxx
	(3.244)	(3.856)	(-1.456)	(3.109)
Level of Education	8.274 xxx	0.733 xxx	0.564 xxx	17.443 xxx
	(5.070)	(10.743)	(9.980)	(3.171)
Sex of Respondents	0.05114	0.002778	0.008046	1.292
	(0.063)	(0.130)	(0.284)	(0.752)
Marital status	-0.660	0.03929	0.009387	1.610
	(-1.151)	(1.289)	(0.473)	(0.515)
Expenditure on other food	-0.515	0.02416	0.02971	-0.700
	(-0.931)	(0.700)	(1.550)	(-252)
R^2	0.977	0.983	0.970	0.898
R^2 Adjusted	0.973	0.976	0.964	0.878
F-statistic	213.822 xxx	285.348 xxx	161.061	44.107 xxx

Source: Field data, 2005

Table 3: Determinants of Local Rice Consumption

	Linear	Double-Log	Exponential	Semi-Log
Constant	-2.462	-4,424*	1.747***	-106.100***
	(-0.266)	(-1.816)	(3.054)	(-2.606)
Price of commodity	0.003195***	0.153	0.00002690	6.132
	(2.873)	(1.029)	(0.316)	(2.471)
Price of substitute	-0.00006590	0.120	0.0000026017	2.552
	(-0.102)	(0.616)	(-0.061)	(0.787)
Monthly income	0.0003365***	0.457*	0.00002133*	11.301***
	(2.200)	(1.957)	(1.997)	(2.895)
Household size	-0.135	-0.560*	-0.137*	-2.060
	(-0.122)	(-1.940)	(-1.877)	(-0.427)
Frequency of consumption	0.735	0.986***	0.197***	10.445*
	(0.613)	(2.930)	(2.680)	(-1.857)
Level of Educationon	-0.09757	-0.06332	-0.02197	-5.059
	(-0.154)	(-0.168)	(-0.544)	(-0.802)
Sex of Respondents	1.610	-0.145	-0.104	-1.204
	(0.440)	(-0.644)	-(0.544)	(-0.319)
Marital status	4.251***	0.573**	0.234***	7.742**
	(3.517)	(2.539)	(3.028)	(2.053)
Expenditure on other food	-0.0003207	-0.01382	0.000001995	-5.679
	(-0.913)	(-0.062)	(0.088)	(-1526)
R^2	0.674	0.561	0.497	0.675
R^2 Adjusted	0.585	0.441	0.360	0.587
F-	7.589***	4.687***	3.621***	7.627***

Source: Field data, 2005.

Furthermore, the analysis showed that increase in the coefficient of the monthly income (X_3), holding other variables constant, resulted to 2.774% increase in the consumption of local rice due to the positive relationship it has with the quantity of local rice consumed at 1% level of significant. This of course is in line with *a priori* expectation (Oji, 2002).
More so, the analysis revealed that marital status X_5 had a positive relationship with quantity of local rice consumed at 1% indicating level of significant that marital status is also a major factor influencing the variability in consumption observed in the analyses. Married people have larger household size than singles and so consumption is higher.

The value of the R^2 (67.40%) indicates that there exist other variables affecting local rice consumption in the study area, that were not included in the model. This could include qualitative factors like taste and preferences, customs and traditions and urban exposures of the household as well as other exogenous factors like government policies.

Rice Consumption (Foreign and Local Pooled)
The OLS regression analyses results for rice consumption (foreign and local pooled), are summarized on table 4. The linear functional form was also chosen as the lead equation because the R square value is the highest at 76.9% indicating that the observed variations in the resultant output are explained by the included variables, six of the explanatory variables were significant at land 10% respectively. The result of the regression analyses showed that the price of the commodity (X_1), had a strong positive relationship with the quantity of foreign and local rice consumed which means as the price of the commodity increased, the quantity of rice (foreign and local) consumed by the household increased. This however is contrary to the *a priori* expectation.Also the price of substitute commodity (X_2) showed a positive relationship with the quantity consumed of rice (foreign and local). This implies that as the price of substitute increased, the quantity of rice consumed increased. It is therefore in line with *a priori* expectation (Jhingan, 1977; Hanson 1970; Onyebinama, 2000).

Table 4: Consumption of Rice (Foreign and Local Rice Pooled)

Variables	Linear	Double –Log	Exponential	Semi-Log
Constant	-0.134	-1.844^{xx}	1.868^{xxx}	109.558^{xxx}
	(-0.032)	(-1.979)	(7.235)	(-5.895)
Price of commodity	0.0003800^{xxx}	0.292^{xxx}	0.00009956^{xxx}	7.929^{xxx}
	(6.285)	(3.662)	(2.704)	(4.992)
Price of substitute	0.0004689^{xxx}	0.103	0.00001174	3.702^{xx}
	(2.774)	(1.143)	(0.555)	(2.062)
Monthly Income	0.00001632^{xxx}	0.116	0.000013371	5.699^{xxx}
	(2.774)	(1.2830)	(0.942)	(3.164)
Household size	0.557	-0.09313	-0.001365	2.202
	(1.514)	(-0.832)	(-0.061)	(0.986)
Frequency of Consumption	1.112xxx	0.487^{xxx}	0.05841^{xxx}	10.067^{xxx}
	(3.160)	(4.175)	(2.7271)	(4.324)
Level of Education	-0.154	0.08419	0.008224	0.363
	(-0.523)	(0.497)	(0.460)	(0.101)
Sex of respondents	1.095	-0.07179	-0.02508	0.705
	(0.640)	(-0.726)	(-0.241)	(0.357)
Marital status	1.854^{xxx}	0.370	0.133^{xxx}	4.087
	(3.246)	(3.597)	(3.828)	(1.990)
Expenditure on other food	-0.0002325^{x}	-0.04525	-0.000002216	-3.597^{xx}
	(-1.925)	(-0.512)	(-0.301)	(-2040)
R2	0.799	0.621	0.561	0.745
R2 adjusted	0.799	0.583	0.517	0.716
F-Statistics	38.967^{xxx}	16.045^{xxx}	12.514^{xxx}	28.530^{xxx}

Source: Household survey data (2005)

Furthermore, monthly income (X_3) was revealed to also have a positive and significant relationship with the quantity of rice (foreign and local pooled) consumed. This indicates that as the monthly income of the households increased, the quantity of rice consumed increased also. This might be because of synergy or the positive sign came as a result of multicollinearity (Koutsoyiannis, 1977). Rice is regarded as an elite food hence increase in income reflects directly on living standard. Improved living standard can in turn manifest in consumption of more rice. Frequency of rice consumption (X_5) had a positive relationship with the quantity of rice consumed. This means that as the frequency of consumption of rice increased in the household, the quantity of rice consumed also increased. This also agrees with *a priori* expectation.

Marital status (X_8) as shown in the analysis, related positively with the quantity of rice consumed. The review of the socio-economic characteristics showed that greater proportion of the respondents consist of those who have ever married which supposse a larger household. Hence the result is in line with the a priori expectation (Quartey, 2005).

Total expenditure on other food items (X_9) has a negative relationship with the quantity of y (rice) consumed in the study area. This inverse relationship indicates that as the total expenditure increased, the quantity of rice consumed decreased. This of course is in line with the *a priori* expectation as money meant for rice are being spent on other items.

The value of R^2 (79.90%) indicates that there are still other variables which affect both foreign and local rice consumption of both foreign and local rice in the study area, which were not included in the model. This could include qualitative factors like taste and preferences, customs and traditions, urban exposures of the household heads as well as other exogenous factors like government policies. The F-ratios for all the functional forms were statistically significant showing that the people in theses study area consume rice substantially, hence justifying the research work in this area.

Meanwhile, from the linear multiple regression model, the following elasticties were calculated:

a. Price elasticity of demand for rice =4.174.
b. Price elasticity of demand for rice substitute =0.059.
c. Income elasticity for rice =0.0117.
d. Frequency of consumption elasticity of demand for rice =0.129.

The price elasticity of demand for rice is greater than one. This implies that the demand for rice is elastic. A unit change in price for rice causes a more than proportionate change in quantity of rice consumed.

The price elasticity of demand for rice substitute is small but positive. This implies that the demand for rice substitute is inelastic. Also a unit change in price of rice substitute causes a less than proportionate change in the quantity of rice consumed. This is also the same for income elasticity of demand for rice and elasticity of the frequency of consumption on quantity of rice consumed.

In conclusion, this result showed that x_1, x_2, x_3, x_5, x_8 and x_9, were the major determinants of the consumption of rice generally. The elasticities showed the degree of responsiveness of quantity consumed of rice with changes in the key variables.

As already explained in the methodology, the F-statistics required for the test in structural difference in foreign and local rice consumption function may be computed as follows;

$$F^* = \frac{[\sum e^2_p - (\sum e^2_1 + \sum e^2_2)]/K}{(\sum e^2_1 + \sum e^2_2 / (n_1 + n_2 - 2K)}$$

Where e_p, e_1, e_2, n_1 n_2 and k are as already explained. Applying the data from the pooled (foreign and local rice), foreign and local rice consumption multiple regressions, F-ratio may be computed as follows;

$$F^* = \frac{[5856.772 - (3941.049 + 356.768]/10}{(3941.049 + 356.768)/ (55 + 42 - 2(10)}$$

$$= \frac{5856.772 - [4297.817]/10}{4297.817/97 - 20}$$

$$= \frac{5856.772 - 429.7817}{4297.817/77}$$

$$= \frac{5426.9903}{} = 97.23$$

55.8158

F*=97.23.

The tabulated F value at (0.001&0.005%) is 1.91&2.47 respectively.

From the above, we see that F* calculated is greater than the tabulated F- value, i.e. F*> F (0.001 and 0.005), therefore we reject the null hypothesis which says that there is equality in foreign and local rice consumption in the study area and so we accept the alternative hypothesis which says that there is no equality in the consumption foreign and local and local rice in the study area, hence foreign rice consumption is higher than the consumption of local rice in the study area.

CONCLUSION AND RECOMMENDATIONS

The result of the multiple regression analysis showed that the linear functional form largely explained the variations in the quantity of rice consumed more than double-log, exponential and semi-log functions and hence was used for further analysis of the data.

In the regression analysis, the price of the commodity (X_1), the price of the substitute (X_2), monthly income (X_5), level of education of household heads (X_6), marital status household heads (X_8) and total expenditure of consumer household on other food items were found to be statistically significant. The price elasticity of demand for rice, price elasticity of demand for rice substitute, income and frequency of consumption elasticities of demand for rice were defined.

The price elasticity of demand for rice was positive and greater than one, which implies that the demand **for** rice is elastic. The price elasticity for rice substitute is less than 1 i.e. inelastic. This means that the consumption level of rice substitute does not respond much to changes in the price of rice. However, the positive sign suggest that there is a substitution relationship between them.

The income elasticity and frequency of consumption elasticity of demand for rice are positive but less than one, which implies that their demand for rice is inelastic.

The results of the regression comparing various consumption functions for foreign and local rice in the study area were tested using F-test postulated by G.C. Chow and it proved that people in the study areas consume more of foreign rice than local rice.

This therefore recommended that the unexploited potentials and new technological innovations that have the capacity of increasing the indigenous yield substantially should be tapped.

This will help to meet the ever increasing domestic demand for rice in Nigeria.

Research Institutes in Nigeria should also be empowered in order to improve varieties and techniques for local production which will enhance productivity and quality. If sufficient high quality local rice is produced, foreign rice will automatically be displaced and huge funds conserved for other uses.

Important infrastructures should be put in place for instance, good seed system, farm inputs, tractor services, roads, electricity, and good water to facilitate rice production, processing and evacuation from rural areas.

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