# Consumption Pattern of Ofada Rice among Civil Servants in Abeokuta Metropolis of Ogun State, Nigeria

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**Abstract**
The study was carried out to determine the consumption pattern of Ofada rice among civil servants in Abeokuta metropolis of Ogun State with a view to identifying the various factors that affect Ofada rice consumption among the respondents in the study area. A total of 60 respondents were selected from six randomly selected ministries in the metropolis. Combinations of simple random and stratified sampling techniques were used for the study. The civil servants were stratified based on their income levels. Data collection was effected through the use of well structured questionnaires. The study revealed that household monthly expenditure on Ofada rice increases with increase in household monthly income, household size and household expenditure on food. It also showed that educational level and household monthly expenditure on Ofada rice substitute have negative relationship with household monthly expenditure on Ofada rice. Based on the outcome of the findings, it is recommended that increase production of ofada rice be encouraged to ensure food security.
**Keywords**: Ofada rice, Socio-economic characteristics, Consumption, Descriptive and Regression analysis

## 1.    Background to Study

The Nigerian rice sector has seen some remarkable developments over the last quarter century. Both rice production and consumption in Nigeria have vastly increased during the aforementioned period. Notwithstanding, the production increase was insufficient to match the consumption with rice imports making up the short fall. With rice now being a structural component of the Nigerian diet, there is a considerable political interest in increasing the consumption of local rice. This has made rice a highly political commodity in Nigeria (Akpokodje et al., 2001)

The demand for rice has been increasing at a much faster rate in Nigeria than in other West African countries since the mid 1970. For example during the 1960's Nigeria had the lowest per capita consumption of rice in the sub-region (average of 3kg). Since then, Nigerian per-capita consumption levels have grown significantly at 7.3% per annum consequently, per-capita consumption during the 1980's averaged 18kg and reached 2.2kg in 1995 – 1999. Despite the catching up of per – capita consumption with the rest of West Africa, Nigeria consumption levels still lag the rest of the sub – region (34kg in 1995 – 1999) (Akande, 2001).

Of all the staples crops, rice has risen to a position of pre-eminence. Since the mid – 1970's, rice consumption in Nigeria has risen tremendously at about 10% per annum due to changing consumer preferences ( Akande, 2001). Rice is a cereal foodstuff which forms an important part of the diet of a great many people worldwide. It is the world's most extensively cultivated food crop and forms the staple of over 3 billion people constituting over half of the world's population. In other words, it is the most important cereal for human consumption (Cantra and Reeves 2002). Rice is grown in all ecological and dietary zones of Nigeria, with different varieties possessing adaptation traits for each ecology (Sanni et al., 2004). The two commonly cultivated varieties of rice in Nigeria are; *Oryza sativa* and *Oryza glabberima* (Abulude, 2004). Saka et al., (2005) noted that that ITA 150 and Ofada rice were the most prominent and local rice varieties in Nigeria.

However, Osareti et al., (2007) found that most Nigerians prefer to consume imported rice brands as compared to local rice varieties like Ofada. Also, despite this soaring demand for Ofada rice, the industry is currently not able to meet the adequate supply. The question then is what could be responsible for this development? Could it be due to its expensive nature compared to imported rice brands or are there other socio-economic reasons that are yet to be identified?   This study attempts to proffer answers to stated research questions by studying the consumption pattern of Ofada rice among Civil servants in Abeokuta metropolis. The objectives of the study therefore are to: describe the socio-economic characteristic of Ofada rice consumers; determine the frequency of

Ofada rice consumption among civil servants in the study area; determine the proportion of consumer income devoted to expenditure on Ofada rice; determine factors that influence Ofada rice consumption in the study area and proffer recommendation(s) based on the findings.

It is a belief that the outcome of this study would among other things, indicate the level of acceptance of Ofada rice as well as explain factors responsible for its consumption among the respondents. This information would assist policy makers and planners in understanding the present state of Ofada rice consumption with the purpose of evolving policies and programmes that will boost production, distribution and consumption and thus reduce Nigeria's reliance on importation to meet local demand.

## 2.    Literature Review

### 2.1         The Nigerian Rice and Quality Issue.

A study on rice milling in Nigeria indicates that rice production and consumption in sub- Saharan region remains substantial.   The region is projected to import 6.7 million tonnes in 2006 with Nigeria accounting for 20% of the sub Saharan Africa's rice imports.   The total domestic rice demand is estimated at about 5 million metric tonnes.   However, it is anticipated that Nigeria would continue to depend on imports for sometime to come given the fact that Nigeria imports a third of its total rice supplies.   Imported parboiled rice meets the consumer demand in urban areas where incomes are higher.   Locally milled rice is of poor qualify and is consumed mainly in the rural areas (www.ricenigeria.com).

Lancon et al. (2003) observed that rice milling in Nigeria is a "cottage industry" mainly carried out by small scale workshop with an average hourly capacity of 200kg of milled rice. The majority of the millers do not trade produce i.e purchase paddy rice and sell rice – but only purchase paddy rice and sell rice on a fee basis for others. He further stated that, under the current level of price for imported rice, it is worth to   invest in improved technology to enhance the appearance and cleanliness of the local rice to match imported rice standards

Rice has established itself as a preferred staple in Nigeria. The increase in rice demand is attributed to a consumer shift from traditional staples, such as yam and gari to imported parboiled rice.   Only a limited portion of locally grown rice crop is available for key urban markets centres such as Lagos, because small scale rice farmers produce subsistence levels of rice with remaining surplus portions consumed at the village level.

Locally, milled rice is also of poor quality and quantity falls far short of urban demand.   Many urban consumers are also weary of picking stones from the rice and washing local rice several times while imported rice is clean and free from foreign matter (FAS attaché 2001 rice report).

WARDA in its policy study on the Nigeria rice sector observed that the relatively poor quality of Nigerian rice is the primary constraints to further development of the sector. Prof. Tollens also stated that "it is important to recognise that milling, cleaning and branding are important for the local rice.   Otherwise, consumers will continue to view local rice as an inferior product and it will be of no use to continue production.

### 2.2   Ofada Rice Production, Consumption and Constraints

Ofada rice is one of the locally produced rice varieties in Nigeria.   It is short, robust, with brown stripes because it is cultivated in chemical free atmosphere.   It is mostly planted in Ogun state and some other south western states of Nigeria.   When cooked, Ofada rice emits a unique aroma that is often the first attraction.   It is self-preservatory and one of such foods that add value to the lives of health conscious people including those who are diabetic who experts have warned not to eat rice (www.ultimate ofada rice).

Osareti et al., (2007) discovered that Ofada rice variety contains higher protein at raw, cooked and soaked states as compared to imported rice (Aroso).   It was also found that Ofada rice contains rough surface and more phosphorus and fibre which help in the reduction of the risk of bowel disorders and fight constipation.   The consumer preference for imported rice may be due to its enrichment with vitamins, since local Ofada rice is not fortified with any micronutrients.

Lancon et al; (2003) in his rapid appraisal of consumer's prefer imported rice, conformed that imported rice cleanliness is the overwhelming factor behind the expansion of imported rice consumption in Nigeria at the expense of local rice development and in spite of an increasing tariff barrier.

However, when prices and grain appearance are put aside, customers acknowledged the attractiveness of Nigerian rice organoleptic properties –an asset that can not be properly exploited   in the current situation due to the poor performance of the rice commodity chain in terms of quality management. The study also shows that local marketing suffered from higher transaction cost in urban markets induced by scattered and irregular supply of product. These constraints tend to turn rice retailer away from the local rice marketing in favour of the improved rice.

Akande (2001) opened that the soaring demand for rice in Nigeria was partly the result of increasing population growth, increased income levels, rapid urbanization and associated changes in family occupational structures.

The average Nigeria now consumes 24.8kg of rice per year, representing 9% of total caloric intake. Rice has become a major source of calories not only for the affluent, but also for the urban and rural poor in many parts of the Africa continent.   Its availability and price have become major determinant of the welfare of the poorest Africa countries.

Worsley *et al*., (2002), found that per capita income was extensively related to the consumption of individual foods and total and food group variety indexes .He further observed that socio-economic indicators including education and gross household income have been shown to be linked in complex ways to food consumption. The observed differences were attributed to household income and basic education attainment (age when left school).   Johnson *et al*; (1999) and Lasheras *et al*; (2001) suggest secondary education may be involved.

Worsely however, rejected the common assumption and belief that individual of lower socio-economic status tend to choose foods that are lower in price than do people from higher socio-economic status background. This corroborated Turrell (1996, 1998) finding which suggests that food consumption may be determined more by social and psychological factors than by economic consideration.

Wardle *et al;* (2000) found that people from higher socio-economic status background tend to consume foods which are more novel, more conventionally nutritious or more luxurious than foods consumed by lower socio economic status.

### 3.    Methodology

#### 3.1   Study area

The study area is Abeokuta metropolis, the capital city of Ogun State. Ogun State is one of the 36 states in Nigeria.The state, otherwise known as the Gateway state came into existence in 1976 and it is one of the emerging industrial centers in the western parts of Nigeria.It lies within the tropics, bounded in the west by Benin Republic, in the south by Lagos and Atlantic ocean, in the east by Ondo state and in the North by Oyo state. Abeokuta is in the tropical rainforest zone of Nigeria and this geographical location makes it easily accessible. The city is dominated by civil servants, traders, public officers, private businessmen, contractors and artisans.

#### 3.2 Sources of Data

The main source of data for this study was primary.  This was done through the use of well-structured questionnaire to solicit for relevant information from the respondents.

However, past research works, articles on related topics as well as other scholarly journals provided the much needed impetus for the study. All these constitute my secondary source of data.

#### 3.3    Sampling Technique and Sample Size

Simple random sampling technique was used in selecting six (6) ministries in the metropolis.  A list of ministries in the metropolis served as the sample frame.

Systematic sampling technique was then used to pick ten (10) respondents from each of the six randomly selected ministries giving a total of sixty (60) respondents. The respondents were also stratified into low, medium, and high income earners homogenous classes.

#### 3.4      Analytical Techniques

3.4.1 Descriptive Statistics were used to:
 i.  describe the socio-economic characteristic of ofada rice consumers.
 ii.  determine the frequency of ofada rice consumption among civil servants in the study area.
 iii.   determine the proportion of consumers' income devoted to expenditure on ofada rice.

3.4.2 Regression analysis was used to determine factors influencing ofada rice consumption.

The factors considered in this study are;   household monthly income, household monthly expenditure on food, household expenditure on ofada rice, household expenditure on ofada rice substitute, household size, age of respondents, education level

#### 3.5   Model Specification

The model for this study is specified as follows;
$$Y = f(X_1, X_2 X_3,\ldots\ldots X_6 \, U)$$
$Y$ = Household monthly expenditure on ofada rice (₦)
$X_1$ = Household monthly income (₦)=
$X_2$ = Household monthly expenditure on food (₦)
$X_3$ = Household monthly expenditure on ofada rice    substitutes (₦) substitutes.
$X_4$ = Household size (Number)
$X_5$ = Age of household head (years)
$X_6$ = Educational level

U     =     Error term.

The apriori expectations are: $\lambda_1 > 0$, $\lambda_2 > 0$, $\lambda_3 < 0$, $\lambda_4 > 0$, $\lambda_5 > 0$, $\lambda_6 > 0$,

The functional forms fitted are:

    i.       Linear     Y  =  $\lambda o + \lambda_1 X_1 + \lambda_2 X_2 + \lambda_3 X_3 + \lambda_4 X_4 + \lambda_5 X_5 + \lambda_6 X_6 + U$

    ii.      Semi-log    Y  =  $\lambda_0 + \lambda_1 \ln X_1 + \lambda_2 \ln X_2 + \lambda_3 \ln X_3 + \lambda_4 \ln X_4 = + \lambda_5 \ln X_5 + \lambda_6 \ln X_6 + U$

    iii.     Double-log $\ln Y$  =  $\lambda_0 + \lambda_1 \ln X_1 + \lambda_2 \ln X_2 + \lambda_3 \ln X_3 + \lambda_4 \ln X_4 + \lambda_4 \ln X_4 +$

$$\lambda_5 \ln X_5 + \lambda_6 \ln X_6 + U$$

Where; Y = Dependent variable (Household monthly expenditure on ofada rice in Naira)

        $\omega, \lambda_i$ = Parameters estimated

      $X_i$ = Independent variables

          U = Error term.

          Ln= Natural Logarithm

## 4.    Results and Discussion

4.1: Socio-economic Characteristics of the Respondents

Table 2 shows the socio-economic characteristics of the respondents in the study area. The results show that majority (about 53%) of ofada rice consumers are females.   The age reveals that most (about 43%) are between the age brackets of (30-39). This implies that the younger civil servants consumer more ofada than their older counterparts. The mean age is 34 years. Also, most (68%) are married, indicating that most consumers of ofada rice are married class. Majority of the rice consumers (57%) have Bachelor degree or Higher National Diploma Certificate. The table also revealed that majority (50%) of the respondents household size is between 4 and 6. This means that respondents with household size 4-6 consume more ofada rice that those with less or greater household size.

4.2: Consumption characteristics of Ofada Rice Consumers

Table 3 shows the consumption characteristics of ofada rice consumers. The result shows that most of the respondents (36%) have monthly salary from their primary occupation (i.e civil service alone) range between (₦ 20,001 to ₦ 30,000).   It also shows that high proportion (32%) of the respondents' consumer ofada rice twice a week. This implies that ofada rice is consumed weekly. The results equally reveal that majority (72%) of the ofada rice consumers spend less than ₦ 2000.00 on ofada rice monthly.

4.3 Regression Analysis

Regression analysis was used to show cause-effect relationship between dependent and independent variables. The dependent variables for the study was household monthly expenditure on Ofada rice in naira (Y) and the independent variables were operationalised to represent the factors that were presumed to have fitted to show technical relationship between the dependent and independent variables. The lead equation was selected based on the statistical and econometric criteria indicated

4.3.1 Lead Equation

The double -log functional form was chosen as the lead equation because it best satisfies most of the apriori expectation with regards to the signs and magnitude of parameters estimates.

The lead equation is written below.

$Y = bo + b_1 \ln X_1 + b_2 \ln X_2 + b_3 \ln X_3 + b_4 \ln X_4 + b_5 \ln X_5 + U$

$Y = 1.748 + 0.681 X_1 + 0.405 X_2 - 1.075 X_3 + 0.422 X_4 + 0.0422 X_5 - 0.468 X_6$

   (1.327)  (2.097)     (6.124)    (-14.871)  (2.277)      (0.390)     (-4.029)

$R^2 = 0.648$    Adjusted $R^2 = 0.635$

4.3.2 Interpretation or the lead equation

The lead equation shows that variable $X_1$ (household monthly income) and $X_4$ (household size) are significant at 5% level while variable $X_2$ (household monthly expenditure on food), $X_3$ (household monthly expenditure on Ofada rice substitute) and $X_6$ (Educational level) are significant at 1% significance level respectively (table 4).

4.3.4 Influence of the variables on the monthly expenditure on ofada rice

$X_1$ (household monthly income). This shows positive relationship every additional with total monthly expenditure on Ofada rice. This implies that for percentage increase in the household monthly income by one percent will lead to 0.681% increase in expenditure on ofada rice. $X_2$ (household monthly expenditure on food), This also shows that there is a positive relationship between household monthly expenditure on food and household expenditure on Ofada rice. This means that for every one percent increase in household food expenditure, there will be an increase of 0.405% increasein expenditure on Ofada rice. $X_3$ (household monthly

expenditure on Ofada rice substitute). This variable indicates that for every one percent increase in expenditure on ofada rice substitute, there will be a decrease of 1.079% expenditure on ofada rice. $X_4$ (household size), For every percentage increase in the household size by one person, there is an increase in household expenditure 0.422%. $X_6$ (Educational level) (Yrs). This shows negative correlation with household monthly expenditure on Ofada rice. This means that one percent increase in years of education of household head will lead to a 0.486% decrease in the expenditure on ofada rice. Ofada rice (table 4).

## 5.    Conclusion and Recommendation

### 5.1   Conclusion

Structured questionnaire was used to collect data for analysis in this study. The descriptive analysis showed that majority of the respondents is highly educated. It was also discovered that most of the respondents (about 31.7%) consume ofada rice twice-a-week. Household monthly income, household monthly expenditure on food, household monthly expenditure on Ofada rice substitutes, household size, educational level household, and consumption of Ofada rice were examined to know their effect on the consumption pattern of Ofada rice in the study area (Abeokuta metropolis). Household monthly income, household size, household monthly expenditure on food, educational level, household monthly expenditure on substitute were all found to have significant effects on household expenditure on Ofada rice.

From the above analysis therefore, it was concluded that monthly income, monthly expenditure on substitute, monthly expenditure on food, household size and educational level are factors that influence household monthly expenditure on Ofada rice in the study area. This implies that attempt to improve all or any of these identified factors by government will improve Ofada rice consumption in Abeokuta metropolis. Consequently, this will reduce food insecurity problem and increased level of productivity which eventually translates to rapid national development. Based on the outcome of the findings, it is recommended that increase production of ofada rice be encouraged to ensure food security.

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**Table 1: Functional forms model**

| Functional forms | Mathematical form | Marginal propensity to consume | Coefficient of elasticity |
|---|---|---|---|
| LINEAR | $Y = \omega o + \lambda x + U$ | $\lambda$ | $\lambda X/Y$ |
| SEMI-LOG | $Y = \omega o + \lambda \log x + U$ | $\lambda/X$ | $\lambda/Y$ |
| DOUBLE-LOG | $\log Y = \omega o + \lambda \log x + U$ | $\lambda Y/X$ | $\lambda$ |

**Table 2: Socio-economic characteristics of the respondents interviewed for the study**

| Socio-economic characteristics | Frequency | Percentage |
|---|---|---|
| **Gender** | | |
| Male | 32 | 53.3 |
| Female | 28 | 46.7 |
| **Age (years)** | | |
| 20-29 | 19 | 31.7 |
| 30-39 | 26 | 43.3 |
| 40-49 | 11 | 18.3 |
| 50 years and above | 4 | 6.7 |
| Mean Age | 34 years | |
| **Marital status** | | |
| Single | 18 | 30.0 |
| Married | 41 | 68.3 |
| Divorced | 1 | 1.7 |
| **Educational level** | | |
| Secondary Education | 6 | 10.0 |
| B.SC/B.A/HND | 34 | 56.7 |
| ND/NCE | 18 | 30.0 |
| Postgraduate | 2 | 3.3 |
| **Households size (No)** | | |
| 1-3 | 26 | 43.3 |
| 4-6 | 30 | 50.0 |
| 7-9 | 4 | 6.7 |
| Total | 60 | 100 |
| **Average households size** | 4 | |
| **Monthly Income    range(₦)** | | |
| >0≤10,000 | 17 | 28.3 |
| 10001-2000 | 10 | 16.7 |
| 20001-30000 | 22 | 36.7 |
| 30001-40000 | 3 | 5.0 |
| 40001-50000 | 6 | 10.0 |
| Above 50,000 | 2 | 3.3 |
| Average income | ₦22,778.42 | |

**Table 3: Consumption characteristics of ofada rice consumers**

| Consumption according to occupation | Frequency | Percentage |
|---|---|---|
| Civil servant alone | 47 | 78.3 |
| Civil servant +Trading | 7 | 11.7 |
| Civil servant +Farming | 4 | 6.7 |
| Civil servant + Artisan | 2 | 3.3 |
| **Frequency of consumption** | | |
| Daily | 4 | 6.7 |
| Twice- a – week | 19 | 31.7 |
| Fortnightly | 10 | 16.7 |
| Monthly | 11 | 18.3 |
| Others | 16 | 26.7 |
| **Monthly expenditure range on Ofada rice** | | |
| Less or equal 2000 | 43 | 71.7 |
| 2001 – 4000 | 6 | 10.0 |
| 84001 – 6000 | 4 | 6.7 |
| Above   6,000 | 7 | 11.7 |
| Mean monthly expenditure on ofada rice | ₦1,941.67 | |

**Table 4: Summary of  multiple regression analysis results on the factors affecting the consumption pattern of ofada rice**

| Model | Constant $b_o$ | $B_1$ | $b_2$ | $B_3$ | $B_4$ | $B_5$ | $b_6$ | $R^2$ | Adjusted $R^2$ |
|---|---|---|---|---|---|---|---|---|---|
| Linear | 842.130 (1.904) | 0.00003022** (2.163) | 0.02370** (1.877) | -.0380*** (-6.772) | 218.185 (0.895) | 22.430 (1.352) | -41.168* (-1.808) | 0.254 | 0.228 |
| Semi-log | -2491.497 (-0.875) | 48.759 (0.209) | 300.322** (2.100) | -1105.830*** (-7.074) | 148.614 (0.371) | 59.676 (0.085) | -629.146** (-2.503) | 0.314 | 0.288 |
| Double-log | 1.748 (1.327) | 0.681** (2.097) | 0.405***-(6.124) | -1.075** (-14.871) | 0.422** (2.277) | 0.04220 (0.390) | -0.458*** (-4.029) | 0.648 | 0.635 |

Values in parenthesis are   t-values                  *** = Parameter is significant at 1% probability level

Y = Household monthly expenditure on Ofada rice (N)         **      = Parameter is significant at 5% probability level.

$X_1$ = Household Monthly income in (N)                  * = Parameter is significant at 10% probability level

$X_2$ = Household Monthly expenditure on food    (N)

$X_3$ = Household Monthly expenditure on Ofada rice    substitute (N)

$X_4$ = Household size

$X_5$ = Age of the household head (Yrs)

$X_6$ = Educational level (year)