

Determinants of Household Expenditure on Some Major Food Items in Uyo Metropolis, Akwa Ibom State, Nigeria

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ABSTRACT--- *This study examined the determinants of household expenditure on major food items viz: staples, meat and meat related products (fish and eggs), beverages and all food items, analyse the income elasticities of demand for all the food items and investigate the marginal propensity to consume (MPC) on the various food items and make policy recommendations based on the findings of the study. Primary data were collected from 179 households using a set of structured questionnaire. The data were analysed using ordinary least square regression (OLS). Results obtained from the analyses showed that the major determinants of household consumption expenditure on foods were found to be income, household size and educational level of household head. Only meat and meat related products were found to be income elastic ($\epsilon_y = 2.529$). Other categorise food classes were income inelastic. The marginal propensity to consume meat and meat related products was highest (0.33) while beverages had the least MPC (0.02). This, therefore, suggest the need to pursue policies that would enhance educational attainment in the study area.*

Keywords--- Household expenditure, determinant, consumption expenditure, staple food, beverages, marginal propensity to consume

1. INTRODUCTION

Though, food consumption has been a subject of critical research all over the world, it is especially more topical and meaningful in developing countries because food expenditures account for a relatively large chunk of household income. In Nigeria, this lingering food problem has kept successive government continually on the food drawing board trying to fashion out ways to resolve it. Such multi-dimensional programmes, institutions, policies and projects for food sufficiency includes: Farm Settlement Scheme and National Accelerated Food Production Programme (1972), Operation Feed the Nation (1976-1979), the River Basin and Rural Development Authority, Green Revolution (1979-1983), the World Bank funded Agricultural Development Project and Directorate for Food, Road and Rural Infrastructure (1985-1993), Special and National Programme on Food Security (2008) with corresponding agency - National Food Reserve Agency etc.

However, extant reports and statistics points to insufficient food supply for the teeming Nigerian population inspite of all these efforts. This has resulted in a big food supply–demand gap which is compounded by high inflation rate. Corroborating this assertion, [9], reported that per capita growth of production of major foods in Nigeria has not been sufficient to satisfy the demands of an increasing population. Similar report by Countryeconomy.com [5] has also shown that the consumer price index (a measure of inflation) increase by 16.98% with a month-on-month increase of 241.2% from 239.30% in September and August, 2017. On month-on-month basis, the urban index was reported by [20] to rise by 0.84% in September 2017, down from 0.99% recorded in August, while the rural index rose by 0.74% in September 2017, down from 0.95% in August 2017.

This rise in the price index according to them, mostly accounted for increase in the prices of food, beverages, housing, water, electricity, transport among others. This high inflation rate has short-chained the purchasing capacity of households on the needed major food items. All these have had their impacts on household expenditure and are compounded by the dynamic household food consumption patterns in Nigeria [17].

The concept of household expenditure on food is an age long concept. Since the hypothetical seminal work of Russian Economist, Ernest Engel (1821-1896) [7] who postulated that the proportion of income spent on food decreases as income

increases [1], several other empirical studies have been conducted on “income - on - food” and other related issues. This is because food as a basic human need of man and it is highly correlated to socio-economic characteristics of households. Isamah [8] in his study reported that household size and income are positively related and that the percentage of expenditure on food items increases as income increases. In like manner, [16] using Maximum Likelihood estimates of the logistic regression model, reported that household size, annual household income, age of household head, among others were strong determinants of household food insecurity and consumption. Adeniyi, Omitoyin and Ojo [1] observed that household income, tribe, household size and composition of household had a significant effect on food expenditure. Usharrani and Reddy [21] found that the consumption of milk and milk related products was influenced by educational attainment, knowledge on availability of nutrients and the level of income of the respondents. Bakhshoodeh and Farajzadeh [3] reported that despite income and price changes for most households and food items, habit had a stronger effect on household’s consumption patterns than income and substitution effects.

Some studies on household food consumption and income distribution usually involved the computation of income elasticities and marginal propensity to consume (MPC). Davies [6] reported that commodities whose consumption increased due to an additional child were those whose demand was income inelastic, whereas those whose consumption decreases were income elastic. Okike [15] assessed the income elasticities of demand for yam, garri, rice, beans and all foods group together. He reported that their income elasticities of demand were positive but less than one. The corresponding propensities to consume coefficients were 0.10, 0.05, 0.03, 0.01, and 0.40 for the four food items and for all foods group together respectively. Aboyade [2] found that the expenditure elasticities were low for staple commodities (coarse grains and tubers) but high for foods rich in protein such as meat, fish and eggs. Okeke [14] disaggregated food items based on their proteinous content. He reported that proteinous food such as meat and fish were eaten occasionally and this was limited by purchasing power and availability. Carbonated beverages, tea and coffee were rarely consumed, whereas, food items such as milk, sugar and rice were considered essential commodities due to scarcity and cost. He concluded that high valued foods (e.g meat, milk, vegetables and fruits) are expensive source of energy and their demand increases with income. Consequently; poor households prioritize to fulfil their basic energy requirements to avoid hunger by taking low valued foods. Corroborated work by [10] and [11] observed that households with income near to subsistence level consume large quantities of grains and starchy staples and few fruits, vegetables, meat, milk and milk products. This is because poor household must meet their physiological needs to satisfy hunger (using cheap sources of energy such as grains and starchy staples) before diversification in diets to include animal food sources, dairy products, fruits and vegetables. All these changes in food consumption are not without corresponding changes in status of households.

Uyo has grown with increased infrastructural development and amenities as well as from a local government headquarters to a capital city of Akwa Ibom State, and it is the largest modern city/urban centre in the state. However, inspite of the changes and growth of Uyo as a State capital, there has not been any recent empirical study to assess the pattern of household expenditure on some major food items in the area. Again, with the Nation’s consumer price index of 16.98% [5], the impact of hardship in the current dispensation in the country may not be equally felt by all socio-economic groups. The opportunities for meeting essential requirements for sustaining a living may vary from one income group to the other. This therefore calls for the need to examine the extent of the variation in household expenditure on some major food items with the view to finding meaningful solutions to the food consumption problem. In achieving this objective, the following research questions were answered: What factors determine households’ expenditure on staples, meat and beverages? How does the demand for food respond to changes in income and what are the magnitude of the propensity of households to consume staples, meat and beverages? In the light of the foregoing, this study aims at analyzing the consumption expenditure of selected households in Uyo Metropolis. The specific objectives were to: examine the determinants of households expenditure pattern on staples, meat and beverages, determine the income elasticities of demand for the various food items, determine the respondents’ marginal propensity to consume staples, meat and beverages and make policy recommendations based on the findings of the study.

2. MATERIAL AND METHODS

2.1 The Study Area

The study was conducted in Uyo Metropolis, Akwa Ibom State. Uyo is the capital of Akwa Ibom State. It is located on latitude 05°3’N and longitude 07°57’E. It is bordered on the south by Ekpe Atai and Nsit Ibom Local Government Areas, on the West by Abak Local Government, on the North by Ikono and Itu Local Government Areas and on the East by Uruan Local Government Area respectively. It has an estimated population of 309,573 as at 2006 from 234,615 in 1996. The temperatures are highest on average in March, at around 31 °C and coldest in July, with temperatures averaging 23°C [4]. It is a commercial nerve centre of the entire Akwa Ibom State. Inhabitants of Uyo Metropolis are workers in public and private institutions and firms. Others are engaged in trading, craft making and transportation business.

2.2 Sampling Procedure

Stratified sampling method was employed in the study. The study area was stratified into cells based on features/characteristics usually associated with low, medium and high density settlements. Due to non-availability of

sampling frame, selection of compounds from which households were chosen was done through “random-walk” method. One household was selected in each compound for detailed study. A total of 60 respondents were selected from high, medium and low income earners areas of Uyo metropolis respectively. This gave a total sample size of one hundred and eighty (180). Out of 180 households, 179 supplied complete data that were used in the analysis while the remaining one (1) was discarded because of incomplete information.

2.3 Methods of Data Analysis

To examine the determinants of household expenditure on major food items viz: staples, meat and beverages, the Ordinary Least Square Method (OLS) of regressions analysis approach was used. The general functional form of the equation is given by:

$$C_i = C = b_0 + b_1X_1 + b_2 X_2 + b_3 X_3 + U_i$$

Where C is the consumption expenditure (₦), b_0 is the intercept, $X_1 - X_3$ are variables, $b_1 - b_3$ are the coefficients and U_i is the stochastic error term to be estimated. The variables are as defined:

C_i is the Total household monthly expenditure on a given food item (₦). C_1 is the household expenditure on all food items (₦). C_2 is the household expenditure on staples (₦). C_3 is the household food expenditure on meat (₦). C_4 is the household expenditure on beverages (₦). X_1 is the total household monthly disposable income (₦). X_2 is the Household size (number of person(s) per household) and X_3 is the Years of formal education of household head (number of years of formal education attainment)

Four (4) functional forms were estimated for exploratory purpose. These were linear, semi-logarithmic, double logarithmic and exponential functions. The lead equation for each food group was selected based on the statistical accuracy of the fitting; theoretical justification, the value of the adjusted coefficient of multiple determination (R^{-2}), standard errors of regression estimates (SE), t-ratios and the reasonableness of the estimated coefficients with respect to sign and magnitude and the absence of multi-colinearity. The SPSS statistical package [16] was used for the computation. To determine the income elasticities of demand for the various food items, income elasticity coefficient, which is a measure of the percentage change in consumption corresponding to a one percent change in income, was computed as: The formula is given below:

$$ey = \frac{\frac{\partial X_q}{X_q}}{\frac{\partial Y}{Y}} = \frac{\partial X_q}{X_q} \times \frac{Y}{\partial Y}$$

Where;

- X_q (endogenous variable) = Quantity of X demanded (₦).
- ∂X_q = Change in quantity of X demanded (₦).
- Y = Disposable income (₦).
- ∂Y = Change in disposable income (₦).

3. RESULT AND DISCUSSIONS

Household’s expenditure worldwide is a function of so many factors. Some of these factors are being examined against some major food items for the households in Uyo, municipality in Akwa Ibom State, Nigeria. The results are as presented as determinants of household expenditure on major food items, staple food items, meat and meat related products; and beverages.

Table 1: Regression Results for Consumption Function for All Food Items.

Variables	Linear	Semi-log	Double-log [∞]	Exponential
Constant	-12993.897 (-2.391)***	-177879.501 (-16.026)***	4.111 (12.669)***	8.773 (51.779)***
Household Income	.037 (6.746)***	16321.978 (12.506)***	.408 (10.687)***	7.171E-7 (4.235)***
Household Size	2401.144 (8.823)***	6962.713 (4.903)***	.182 (4.392)***	.060 (7.052)***
Educational level of Household Head	1775.059 (5.255)***	4243.782 (.914)***	.435 (3.202)***	.070 (6.654)***
R^2	0.647	0.748	0.726	0.563
S.E	10784.93184	9114.21253	.26646	.33631
F. statistics	107.553***	174.078***	155.208***	75.590***

Source: Field survey, 2014, (t-values in parenthesis). ***, **, *Sig. at 1%, 5% and 10 % respectively

Table 1 shows the consumption functions for all food items. The lead equation (∞) for the regression result of the expenditure on all food items comprising yam, garri, rice, beans, plantain and banana, foo-foo, cocoyam, meat, and chicken, fish, eggs, vegetables, palm oil, groundnut oil and beverages was the double logarithmic functional form. The choice was based on the expected *a priori* sign, statistical significance and R^2 . The F-test indicated that the equation was significant at 1 percent level. The R^2 value of 0.73 indicated that the independent variables account for 73% of the variation in the household expenditure on all foods items per month. The income coefficient has a positive relationship of 0.408 and significant at 1% level signifying that as household income increases, consumption expenditure increases equally. This is consistent with *a priori* expectation. The regression result further showed that the regression coefficients of household size and educational level of household heads have positive signs and also showed a significant relationship to consumption of all food items at 1% level. This implies that consumption expenditure on all food items was mainly a function of household disposable income, size and the level of education of household heads. This finding is in line with [8] and [14].

Table 2: Regression Results of Consumption Function for Staples.

Variables	Linear	Semi-log	Double-log ∞	Exponential
Constant	2080.664 (1.121)***	-33417.601 (-7.941)***	6.101 (19.515)***	8.680 (58.207)***
Household	.007	3198.769	.202	8.106E-7
Income	(3.971)***	(6.464)***	(5.498)***	(3.417)***
Household	659.254	2532.731	.186	.037
Size	(7.094)***	(4.704)***	(4.649)***	(4.430)***
Educational level of	392.408	1937.392	.245	.027
Household Head	(3.402)***	(1.101)***	(1.872)**	(2.872)***
R^2	0.465	0.529	0.497	0.423
S.E	3682.64811	3455.74083	0.25675	0.27426
F. statistics	51.034***	65.914***	58.035***	42.446***

Source: Field survey, 2014. (t-values in parenthesis) ***, **, * Significance at 1%, 5% and 10 % respectively

Table 2, showed the consumption function for staples. The double – logarithmic function (∞) with R^2 of 0.49 was selected as the lead equation. The result revealed that all the explanatory variables explained 50% of the total variability in the household expenditure on staple food items in the study area. The household income and size coefficients showed a positive correlation and varies directly with household expenditure in staple food items. The result showed a significant level at 1% in terms of household income and size. This implies that household’s consumption expenditure on staple food items was directly proportional to the household disposable income and size. This is corroborated by [15] and [16].

Table 3: Consumption Function for meat and meat related products (fish and eggs):

Variables	Linear	Semi-log	Double-log ∞	Exponential
Constant	-15759.395 (-3.909)***	-131351.955 (-15.729)***	7.507 (27.570)***	8.582 (61.753)***
Household	.026	11788.845	2.529	4.245E-7
Income	(6.380)***	(12.006)***	(5.839)***	(3.056)***
Household	1577.968	4009.364	0.38	.046
Size	(7.815)***	(3.753)***	(2.512)***	(6.575)***
Educational level of	1277.797	2015.885	0.092	.033
Household Head	(5.098)***	(.577)**	(5.426)***	(3.784)***
R^2	0.611	0.715	0.564	0.420
S.E	8001.55050	6857.35094	0.50080	0.27586
F. Statistics	92.319***	146.909***	74.969***	42.422***

Source: Field survey, 2014. (t-values in parenthesis) . ***, **, * Significant at 1%, 5% and 10 % respectively.

The regression result of Table 3 showed the regression result of consumption for meat and meat related products (fish and eggs). The double logarithmic function was found to be the lead equation (∞) because it had the least standard error (S.E) of all the functions, it explanatory variables explained 56% of the total variability in the household expenditure on meat, fish and eggs and, the F- test for the model specified equation was accepted at 1% level of significant. The dependent variables had positive relationship with the average household’s monthly expenditure on meat and meat related products. Specifically, household disposable income and size were found to be significant at 1% level. This implies that household consumption expenditure on meat, fish and eggs increases in the same direction as the household disposable income, size and educational level of the household heads. The same was reported by [15] on proteinous food item for rural households in Nigeria.

Table 4: Regression Results of Consumption Function for Beverages

Variables	Linear	Semi-log	Double-log [∞]	Exponential
Constant	684.834 (.909)***	-13109.945 (-7.464)***	.028 (.055)**	8.478 (5.417)***
Household Income	.004 (4.866)***	1334.365 (6.461)***	.603 (10.150)***	5.356 E-7 (.342)**
Household Size	163.892 (4.344)***	420.618 (1.872)**	.198 (3.063)***	.030 (.386)**
Educational level of Household Head	104.854 (2.239)***	290.505 (.395)**	.793 (3.749)***	-.017 (-.178)**
R ²	.375	.418	.702	.003
S.E	1495.06775	1442.25307	.41510	3.10683
F. Statistics	35.194***	42.194***	138.253***	.147

Source: Field Survey, 2014. (t-values in parenthesis) . ***, **, *Significant at 1%, 5% and 10 % respectively.

Table 4, contains the results of the regression analysis of consumption expenditure on beverages. The double–logarithmic function offered the highest R² of 0.702 and F-value of 138.25 and was selected as the lead equation (∞). The result of the regression analysis on household consumption for beverages showed that household disposable income, household size and the educational level of household heads significantly affected the average monthly expenditure on beverages. The result indicated that all the independent variables were significant at 1% level. More so, there was a positive correlation among the variable coefficients. The R² of 0.702 indicated that household disposable income, household size and the level of education of the household heads explained 70% of the total variation in the expenditure on beverage while the remaining may be as a result of other factors not captured in the model.

Table 5: Income Elasticities of Demand for Food Items

Food Items	Elasticities
All foods	0.408
Staple food	0.202
Meat, fish and eggs	2.529
Beverages	0.603

Source: Computed from field survey data, 2014.

Income elasticity of demand is a percentage change in quantity demanded over a percentage change in income. Table 5, presents the income elasticities of demand for all foods, staples, meat and meat related products and beverages selected in the study area. The elasticities were the direct partial effects of income. The computed income elasticities for all foods, staples, meat, fish and eggs and beverages are 0.408, 0.202, 2.529 and 0.603 respectively. The result revealed that all the food items except meat were income inelastic. Meat and meat related products had the highest elasticity of 2.529 followed by beverages (0.603). This implies that an increment in income of the households would lead to the consumption of this category of food items relatively more than others. Additionally, the result shows that households will demand more than twice the increase in their income on meat and meat related products. This therefore implies that as the household income increases, the income elasticity on meat and meat related products also increases. This finding corroborate the works of [11, 16].

Table 6: Marginal Propensity to Consume (MPC) on the Various Food Items.

Food Items	Marginal propensity to Consume (MPC)
All foods	0.13
Staple	0.03
Meat, fish and eggs	0.33
Beverages	0.02

Source: Computed from Field survey Data, 2014

This marginal propensity to consume (MPC) was employed to measure the direction of household expenditure’s responsiveness to changes in income. The marginal propensity to consume (MPC) is the additional expenditure resulting from a one unit increase in disposable income. Table 6, presents the marginal propensity to consume (MPC) on the various food items considered in the study area. The table reveals that the marginal propensity to consume (MPC) for all households in the study area 0.13, 0.03, 0.33 and 0.02 for all foods, staples, meat and meat related products and beverages respectively. These suggests that a 1% increase in household income will leads to 13%, 3%, 33% and 2% increase in consumption of these categories of food items respectively.

4. CONCLUSIONS AND RECOMMENDATIONS

Income, household size and households' level of education were found to be the major determinants of household food consumption expenditure. This also shows that large income has the tendency of households to consume good quality food items and procure other basic necessities in life. The income elasticities were highest especially in meat and meat related products. This indicates that, the higher the household income, the higher the rate of household meat consumption to boost the level of protein intake. The MPC suggests that a 13%, 3%, 33% and 2% increase in all foods, staples, meat and meat related products and beverages respectively for every 1% increase in income respectively

To substantially improve the quality of life in the metropolis, there must be a concerted effort to get those who are not educated to be educated to a higher level. This is because; the likelihood of securing a higher paid job tends to increase with the level of educational attainment. It also increases the tendency of the population to adopt new practices that can lead to a rise in income generation.

To improve the income distribution pattern in order to ensure sustainable growth, attempt to reduce income inequality in the study area should be pursued. This can be done by employing adequate and effective tax and subsidy measures. The high income earners can be taxed for some of their consumables while the low-middle income earners can be supported with social security by the government.

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