

# Expenditure Pattern for Beef Consumption in Selected Households in Southern Nigeria

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## Abstract

Against the backdrop of increasing protein deficiency arising from low per capita consumption of animal protein which may pose threat to market demand for beef in Nigeria, this study was designed to analyze the expenditure patterns and determinant of beef consumption in selected households in Southern Nigeria. Specifically, the study was designed to estimate the monthly expenditure on beef; evaluate the influence of household income and household size of expenditure on beef as well as determine other factors which influence the monthly consumption of beef by households in the study area. Structured questionnaire was used to elicit information from sixty households using the simple random sampling technique. Data was subjected to descriptive statistics and multiple regressions analysis. The findings revealed that N3612.00 was used to consume 4.874 kgs of beef per month an equivalent of 0.16kgs per day (16 grammes/day). The preferred model, double log had an  $R^2$  of 0.63 and significant F ratio of 19.34 (significant at 1% level). This indicates that household size and monthly income were the major determinants of household expenditure on beef with elasticity of demands of 0.30% and 0.46% respectively. Both variables had t values of 3.190 and 4.231 respectively. It is therefore recommended that government should enact policies aimed at boosting cattle production in order to bring down price of beef and increase the consumption of beef.

**Keywords:** Expenditure pattern, beef consumption, households

## 1.Introduction

Household expenditure can be spitted into autonomous expenditure and full expenditure. Full expenditure is accounted with price of produced food products and the price of labour (wage rage) and autonomous expenditure is accounted for with number of dependents and age of household. Developing countries such as Nigeria are amongst the low income households where increase in per capital income leads to increase in meat consumption (FAO, 2000).

Meat is a product of livestock farming which has remained an essential component of the agricultural sector of the Nigerian economy. Livestock is a good source of animal protein which is needed for proper and balanced diet and beef is the meat obtained from matured cattle. Red meat product comes primarily from cattle, swine, sheep, and goat and to a lesser extent horse and other animals.

Beef is a major source of animal protein because it contains many nutrients nourishing substance needed by the human body. Its high protein content is available for the growth and repair of the body and as a source of energy. It is an important source of several vitamins, minerals and other nutrients including potassium, phosphorus, sodium, iron, zinc, manic, riboflavin and thiamine. The world demand for beef has risen sharply during the last few decades due to increase in population improvement in technology and increasing incomes (Dafwang *et al* ,2001). Comparative statistics by Ademosum (2000) puts Nigeria's total meat production at 810,000 tonnes for a populations of about 110 million resulting in a meat production index of 22g per day while FAO recommended an average of 35gm animal protein intake per day for a healthy person living in the developing countries (Omolaran, 2004). Therefore, the general well -being of the people is directly dependent on the amount of animal protein consumption available.

Recent estimates listed available energy in Nigeria at 2,093kcal, total protein at 54g, and animal protein including fish and game animals at 8g per person per day. The United Nation/Food Agricultural Organization (FAO) estimated minimum protein requirements at 70gm/capita/day while the recommended protein intake from animal source is 35gm/capita/day. The per capita/day protein intake in Nigeria is 51gm while that from animal sources is 15gm (FAO, 1998). The consumption is ever low especially in the southern part of Nigeria where in recent times human nutritionists have observed that the production of animal protein has not been high enough to meet the demand of the rapid population growth. According to Obi (2003) more than 90% of the meat consumed in Nigeria is produced in the North while the remaining 10% is produced in the south. Every government in power has tried to evolve programmes that could remedy the situation like the National Programme for Food Security (NPFs). Protein is very important in the human body because it builds the body, replaces dead cells,

makes the young grow and fortifies the body against diseases and beef is one of the major sources of protein. This underlines the importance of beef in the diet of the average person in Southern Nigeria. From the above, it is necessary to estimate the amount spent on beef by households in a month; what is the relationship between household expenditure on beef and household income and household size? What are the factors affecting the consumption of beef?

## 2. Purpose of the Study

Specifically, the study was designed to:

- 1) estimate the amount spent on beef by households in a month;
- 2) examine the relationship between household expenditure on beef, household income and household size; and
- 3) determine the factors affecting the consumption of beef in the study area.

## 3. Methodology

The study was carried out in Obio/Akpor local government area of Rivers State, Nigeria. Rivers State is one of the states that make up the Niger Delta Region and it is in the South-South geo-political zone. Obio/Akpor LGA is divided into two major groups, Obio and Akpor. Obio is made up of Evo and Apará. The communities in Evo are: Woji, Rumuobuiakani, ELelenwo, Rumuokwurisi, Oroiawe, Rumuokoro and Iriebe. While Apará communities include: Rumuigbo, Rumuepirikom, Rumueme, Rumuodaolu, Rumuola, Eneka and Rumuokwuta. Akpor communities include: Ozuoba, Alakahia, Rumuekini, Choba, Ogbogoro, Rumuokaparali, Rumuosi, Rumuoulagu, Rumuolumeni and Rumuokurichi. Structured interview schedule was used to elicit information from the respondents. Two communities were randomly selected from Evo, Apará and Akpor. They include: Woji and Rumuokoro from Evo group; Eneka and Rumueme from Apará and Choba and Rumuolumeni from Akpor giving a total of six communities. Ten (10) households were randomly selected from each of the selected six communities to get a total of sixty (60) households that was surveyed from the study. Data collected were analyzed using descriptive statistics, and multiple regression and analysis of variance (AOV). The functional relationship is expressed mathematically thus:

Linear Regression model

$$Q_{db} = b_0 + b_1 P_{b1} + b_2 P_{b2} + b_3 Y + b_4 N + e_i \dots \dots \dots (1)$$

Where:  $Q_{db}$  = Quantity demanded of beef in kilogram

$b_0$  = Intercept

$P_{b1}$  = price of beef in naira/kg

$P_{b2}$  = price of other meat types in Naira/kg

$y$  = Disposable income in Naira

$N$  = Household size

$E_i$  = stochastic error term

Semi – log model

$$Q_{db} = b_0 + b_1 x_1 + b_2 x_2 + b_3 x_3 + b_4 x_4 + e_i \dots \dots \dots (2)$$

Where:  $Q_{db}$  = Quantity demanded of beef in kilogram

$b_0$  = Intercept

$x_1$  = Price of beef in Naira/kg

$x_2$  = price of other meat types in Naira/kg

$x_3$  = Disposable income in Naira

$x_4$  = Household size

$e_i$  = stochastic error term

Double – log model

$$Q_{db} = b_0 + b_1 I_n x_1 + b_2 I_n x_2 + b_3 I_n x_3 + b_4 I_n x_4 + c_i \dots \dots \dots (3)$$

Where:  $Q_{db}$  = Quantity demanded of beef in kilogram

$b_0$  = Intercept

$I_n$  = log to base e of monthly expenditure on beef/per household

$X_1$  = Price of beef in Naira/kg

$X_2$  = price of other meat types in Naira/kg

$X_3$  = Disposable income in Naira

$X_4$  = Household size (count)

$C_i$  = stochastic error term

Dependent variable = quantity of beef demanded

Independent variable = Disposable income, price of beef, price of other meat type (goat meat) and family size of households.

#### **4. Results and Discussion**

##### **4.1 Amount of money expended on beef by household per month**

Table 1 indicates that a high percentage (35%) was spent between (N3000 – N4000) on beef consumption every month. These may probably be people with higher income and consumers who understand the importance of beef to the nourishment, repairs and growth of the body. The other group spent between 0–N2000 (23.3%) on beef consumption monthly in the area. The relatively high number of people in this class indicates that there is still low consumption of beef in the study area.

##### **4.2 Relationship between household expenditure on beef and household income and household size**

Table 2 indicates an average price of beef at N741 per kilogram. The expenditure of households on beef per month was N3612. This is been consumed by a mean household size of 4.12 with an average cost of beef in the area study at N141 per kilogram. It means that 35% of the households consume about 4.874 kilograms per month an equivalent of 0.16kilograms per day (16 grams/day). This figure or consumption rate is extremely low when compared to the animal protein requirements recommended by UN/FAO which stood at 30 grams per capita per day. If this situation is left unchecked protein deficiency may be a major problem in the study area. Furthermore, with the average cost of beef in the study area standing at N741 per kilogram, it means the second group in the rank (<N 2000) (23.3%) consumed approximately 2.024 kilogram of beef per month which is approximately N 1500 per 741 (N 1500/741).

##### **4.3 Effects of Household income and Household size on Beef Expenditure in the study area.**

The relationship between beef expenditure and household characteristics specifically could be gleaned from the results of multiple regression analysis presented in Table 3. The econometric evaluation of the three models used for the multiple regression analysis was carried out before selecting the most appropriate model amongst the three. The model selection criteria used was based on the level of the f-ratios and the R squares. The higher these values are, the better the model. The double log model had a better fit the linear and semi-log models.

From the data in Table 3, the double log model had an R square of 0.63 implying that 63% of the variation in the monthly beef expenditure was influenced by the variation of the four explanatory variables included in the model. This also implies that 37% of the variation in the monthly expenditure of beef was influenced by factors or variables not included in the model. This represents a good fit.

The signs of the coefficients of the variables were also properly signed. For instance, the coefficients of the two major variables (household income & household size) had positive signs implying that for any unit increase in any of these two variables there was an increase in the monthly expenditure on beef in the study area. These are in line with our *a priori* expectations. The slope coefficients of the respective variables represent elasticity of beef expenditure with respect to the various independent variables (demand determinants) of the model. Specifically, the monthly beef expenditure level had an elasticity of 0.46 (0.46%) with respect to the variable household income, a figure significant at 1 percent level (t – ratio = 4.231). This implies that household income has a significant influence in determining the level of beef consumption in the study area. The finding is in line with that of Engle's law which states that the percentage of income spent on food declines as income increases this follows that the expenditure on beef is directly affected by the household's income. Also,

Ikeme (1995) noted a significantly positive relationship between beef consumption and income level of households.

Given the high level of poverty in Nigeria, it is therefore not surprising to note the low mean amount of money spent by households in the study area on beef consumption identified earlier in this discussion. The second variable of interest here, household size posted a coefficient of 0.300 (t value = 3.190). This implies that the elasticity of monthly expenditure of beef demand with respect to household size in the surveyed sample is approximately 0.30 percent. This indicates that for every unit increase in the number of households of the sample there is an accompanying increase in expenditure on beef consumption by 0.30 percent. This finding is also in tandem with theoretical expectations since increase in household size is accompanied by increase in demand for consumption goods including beef (Olagoke, 1983).

#### **5. Conclusion**

Households in the study area have a problem of protein deficiency in average diet. This can be solved by increase in the consumption level of beef. Though beef consumption would reduce the protein deficiency, this is greatly influenced by the income level of the households. It is therefore recommended that the society should be enlightened on the nutritional value of beef. Although it is not advisable for people between the age of forty five

and above to consume more of beef, they should consume other sources of protein like fish, egg, chicken and turkey. Also, government should boost cattle production in the country by enacting policies aimed at boosting cattle production in order to bring down price of beef and increase.

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Table 1: Expenditure on beef by Households Per month.

Household Expenditure	Frequency	%
< ₦ 2,000	14	23.3
>₦ 3,000 – ₦3,000	9	15.0
>₦ 3000 - ₦ 4,000	21	35.0
>₦ 4,000 – ₦ 5000	10	16.7
>₦ 5000 – ₦ 6000	2	3.3
>₦ 6000 – ₦ 7000	4	6.7
>₦ 7000	-	-
Total	60	100.0

Table 2: Summary of Descriptive Statistics of some variables studied

Variables	N	Minimum	Maximum	Mean
Household size	60	1	10	4.12
Price of beef in Naira/kilogram	60	500	1000	741
Price of goat in Naira/kilogram	60	450	1200	801
Expenditure of household on beef in Naria/month	60	1000	7000	3612

Table 3: Results of Multiple Regression Analysis Indicating the Determinants of Beef Expenditure using three models

Model	Parameters	Linear	Semi-log	Double-log
<b>summary and fitness</b>				
	Multiple R Square ( $R^2$ )	0.599	0.605	0.633
	f-ratio	16.79***	17.20***	19.388***
	P-value of the f. ratio	0.000	0.000	0.000
Coefficients	Variables	1672	7.795	11.644
Estimates				
B0	Intercept	(1.285)NS	7(20.045)**	(5.208)**
B1	Household size (count	291.53	0.078	0.300
		(3.152)***	(2.825)**	(3.190)***
B2	Price of beef in Naira/kg	-1.47	0.000	-0.498
		(-100)NS	(-1.333)NS	(-1.714)NS
B3	Price of other meat in Naria/kg	0.002(0.002)NS	0.000(-0798)NS	-0.156(-0.671)NS
B4	Monthly income in Naira/month	703.849	0.230	0.463
		(4.09)NS	(4.483)***	(4.231)***

NB :Dependent variable = monthly Household Beef expenditure in Naira

Figures in parentheses are t ratios

(\*\*\*) = significant at 1% level

(\*\*) = significant at 5% level

NS = Not significant

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