CONSUMPTION ANALYSIS OF PROTEINOUS FOODS IN REMO DIVISION, OGUN STATE, NIGERIA

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ABSTRACT

This study examined the consumption of proteinous food in Remo division of Ogun State, Nigeria. Primary data were obtained in a cross-section survey of 120 randomly selected households drawn by a combination of a multi-stage random sampling and stratified random sampling techniques. Descriptive statistics and ordinary least square (OLS) regression techniques were employed for data analysis. The descriptive statistics of the socio-economic characteristics of proteinous food consumers show that majority (56.7%) of the household heads are about 40 years old, most (73%) of the households' heads are males, of which about 68% are married. A high percentage of the households heads are well educated with mean household size of 4 and mean monthly income of ₦15, 000.00. The *per capita* expenditures on the two classes of proteinous source of foods indicate that the mean per capita expenditure (₦1266.11) on animal protein source food (APSF) is greater than the per capita expenditures (₦239.12) on plant protein source food (PPSF). The results show that animal protein and plant protein consumption accounted for ₦5, 064.43 and ₦956.48 of the household monthly disposable income respectively, representing 41% and 7.8% of household monthly disposable income of the household. With respect to the determinants of plant protein source food (APSF) and plant protein food consumption, the linear regression model was chosen as the lead equations on the basis of high R^2, the conformity of the signs of the coefficients with apriori expectations. The R^2 for animal protein source food (APSF) consumption is 0.80 indicating that 80% of the variations in APSF consumption is due to the influence of the explanatory variables while that plant protein source food consumption is rather low (29%). Household income, household size and years of schooling are the variables that significantly and positively influence APSF consumption while plant protein source food (PPSF) consumption was only influenced by household disposable income.

KEYWORDS: Consumption, animal, plant, protein, food

INTRODUCTION
A healthy and nutritionally well-fed population impacts positively on economic growth and development. However, there have been persistent reports of widespread malnutrition and food insecurity among Nigerians. In 1999, malnutrition prevalence among children under 5 years was estimated at 27.3% while life expectancy at birth was estimated at 46.8 years in 2000 (World Bank 2004).

Malnutrition in Nigeria has been linked to food shortage, both in terms of the quantity available and access to the right type (quality) of food to provide balanced diets Durojaye and Olubanjo 1987, Durojaiye, (2001). A close look at the pattern of food nutrient supply in Nigeria shows that food calorie (energy) consumption by an average Nigerian rose from 2091.50 calorie/caput/day in 1980 to 2418.40 (15:6%) cal/cap/day in 1990 and 2725 cal/cap/day (30.3%) in year 2002; and aggregate protein consumption also rose from 48.5g /cap/day in 1980 to 56.2g /cap/day (15.9%) in 1990 and 61.1g /cap/day (26%) in 2002, (FAO 2004). These protein consumption figures fall short of the critical human body requirement which was put at 70g /cap/day by Food and Agriculture Organisation (FAO, 1985). Moreover, while 50% of the critical protein requirement was recommended to come from animal sources FAO (1985), animal protein content of food supply in Nigeria has been very low and declining. It dropped from 11.5g/cap/day in 1980 to 7.9g /cap/day in 1990 and was as low as 7.5g /cap/day in 2002 (FAO 2004).

A rather more threatening dimension to the food problem in Nigeria is the declining trend in socio-economic conditions among Nigerians (World Bank, 2004). For instance, while adequate income level is important in ensuring that people gain access to food, the incidence of poverty has been on the increase among Nigerians

Balogun (1999). It rose from 28.1% in 1980 to 46.3% in 1985 and by 1996 close to 65.6% of Nigerian was reported to be poor (FOS, 1996). Today, about three-quarters of Nigerians households are speculated to live under abject poverty. The socio-economic conditions of these poor are rather pathetic; they lack skills and gainful employment, and have no access to most basic necessities of life such as food and decent shelter Olayemi (1995). As such, they live in poor health and have short lifespan World Bank, (1995).

Every nation that is burdened with undernutrition will have to make do with a labour force that is lacking in strength and capacity to be fully productive (Belli, 1971). Consequently, it becomes imperative that all hands must be on deck in search of appropriate solutions to the problem of nutritional imbalance among Nigerians.

Emerging bodies of literature Lutz *et al*, (1997), Nayga, (1994), Adelaja, (1997), Abdulahi and Aubert, (2004) suggest that income is important in determining the level of household access to food, the choice and a right quality food mix that can guarantee adequate nutrient intake, health and productive life are also substantially influenced by socio demographic variable like education, age, gender, and many other. Thus, this study analyzed the influence of socio- economic characteristics on food and nutrient consumption among households in Remo division.

MATERIALS AND METHODS
 Study was conducted in Remo Division of Ogun State, which comprises 3 Local Government Areas. Primary data were obtained in a cross-section survey of 120 randomly selected households drawn by a combination of a multi-stage random sampling and stratified random sampling techniques in 2006. Each Local Government Area was regarded as a sub unit of the study area. At the second stage, a total of 10 wards were selected randomly from the 35 wards using probability proportional to size of the local government area. In each ward 12 households were randomly selected with proportionate representation of high, medium and low-income families using income as a stratification factor.

Descriptive statistics was employed in the analysis of the socio-economic characteristics of the proteinous food consumers and per capita protein consumption while ordinary least square regression technique was utilized to capture the effects of socio-economic variables on proteinous food consumption. Three functional forms: linear, semilog and Double logarithmic were fixed and the lead equation was chosen on the basis of the consonance of the results with economics and econometric criteria.

The model specification of the consumption function used in its implicit form is:

$$Y= f (X_1, X_2, X_3, X_4, X_5, X_6, U)$$

Where
Y=Average monthly consumption of each portentous food by the families.
X_1=Household head monthly income (₦)
X_2=Household head education level (years)
X_3=Household size
X_4=Age of household head (year)
X_5=Age square of the household head
X_6=Marital status
U= Error term

RESULTS AND DISCUSSION
The socio-economic characteristics considered in this study are age, sex, marital status, household size, educational status and consumer's income. The descriptive statistics of the socioeconomic characteristics of animal protein consumers is presented in Table 1. Most (56.7%) of the household heads are about 40years old, majority (73%) of the households' heads are males, of which about 68% are married. A high percentage of the households heads are well educated with mean household size of 4 and mean monthly income of ₦15, 000.00.

Table: 1 Socio-economic economic characteristics of animal protein consumers

Characteristics	Frequency	%
Age (years)		
Below 30	28	23.30
31-<40	36	30.00
40-<50	32	26.70
50-<60	15	12.50
60 and above	9	7.50
Gender		
Male	87	72.50
Female	33	27.50
Marital status		
Single	11	9.20
Married	82	68.30
Divorced	13	10.80
Widowed	14	11.70
Household size		
1-4	91	75.80
5-7	29	24.20
Income level		
Below ₦15000	64	53.30
₦15000-<30000	33	27.50
₦30000 and above	23	19.20
Educational status		
No formal education	25	20.80
Primary	24	20.00
Secondary	29	24.20
NCE/Diploma	20	16.70
Degree	32	18.30

Per capita expenditure on proteinous food

Proteinous food can broadly be classified into two: animal protein source food and plant protein source food. The per capita expenditures on the two classes of proteinous source of foods are presented in Table 2. The result indicates that the mean household expenditure on animal protein source food (APSF) is greater than that on plant protein source food (PPSF), implying that most of the households in the study area consumes more of APSF than PPSF. This is in consonance with the recommendation of FAO, that preference should be given to animal protein (FAO, 2004). In the same vein, the *per capita* expenditure on APSF is greater than that on PPSF; however, the per capita expenditure on the two protein sources of food is relatively small compared with *per capita* expenditure on non-protein source of food. While the sum total *per capita* expenditure per month on both APSF and PPSF is ₦2771.3375, the *per capita* expenditure on non-protein source food is ₦3051.26, indicating that a relatively high percentage of the consumers' income in the study area was devoted to non-protein source food.

The results in Table 2 also show the *per capita* expenditure on the food components of the APSF and PPSF as well as the proportion of income devoted to each of these components. With respect to animal protein source food, the highest *per capita* expenditure is on beef while the lowest is on egg. Low expenditure on egg, which, according to many sources contain most of the protein and vitamins required for healthy living leaves much to be desired with respect to the health status of the consumers captured in this study and by extension, that of Nigerians.

Table 2: *Per capita* household expenditure on animal and plant protein source food

Descriptive	Mean Household Expenditure	% Income	Per capita	
			Mean	Food share
PROTEIN FOOD ANIMAL PROTEIN				
Beef	1735.41	6.8572	433.8525	14.2188
Fish	1833.08	7.2431	458.27	15.0191
Milk	643.73	2.5436	160.9325	5.2743
Egg	321.87	1.2718	80.4675	2.6372
Other meat	530.35	2.0956	132.5875	4.3453
Total animal protein	5064.4333	20.0112	1266.1083	41.4947
PLANT PROTEIN				
BEANS	539.41	2.1314	134.8525	4.4196
Other plant protein	417.07	1.6480	104.2675	3.4172
Total plant protein	956.4833	3.7794	239.1208	7.8368
Total protein	6020.9167	23.7906	1505.2292	49.3315
Vegetable & other	522.96	2.0664	130.74	4.2848
Starchy food	5661.15	22.3690	1415.2875	47.3838
Total non protein	6184.1083	24.4354	1546.0271	50.6085
Total food	12205.025	48.2260	3051.2563	
Non food				
House rent	777.01	3.0702	194.2525	
Health care	1376.29	5.4382	344.0725	
Clothing	2039.28	8.0578	509.82	
Body care	1093.77	4.3218	273.4425	
School fees	3784.84	14.9551	946.21	
Other	3001.55	11.8601	750.3875	
Total non food	12072.742	47.7033	3018.1855	
Total expenses	24277.767	95.9290	6069.4418	
Household income	25308.000	-	6327.000	

Source: Computed from field survey (2006)

DETERMINANTS OF PROTEIN SOURCE FOOD CONSUMPTION
(a) Consumption of animal protein source food (APSF)

The determinants of consumption of APSF are presented in Table 3a. The linear regression model was chosen as the lead equation on the basis of high R^2, the conformity of the signs of the coefficients with *apriori* expectations. The R^2 is 0.80 indicating that 80% of the variations in APSF consumption is due to the influence of the explanatory variables. Household income, household size and years of schooling are the variables that significantly and positively influence APSF consumption. This implies that animal protein consumption is directly proportional to income, household size and years of schooling. This result is in consonance with the findings of direct proportionality of consumption and income, household size and years of schooling by (Abdulahi and Aubert 2004, Bamiro *et al*, 2005). With respect to each component of APSF, consumption of beef and fish as shown in Table 3b are significantly determined by the household income and household size. While the marginal propensity to consume beef is 0.04 and that of fish is 0.02, indicating that for every increase in income additional 4kobo and 2kobo will be expended on beef and fish respectively. Household income is the only significant variable that determined the consumption expenditure on milk in the study area. Egg consumption is influenced by household income and years of schooling. Other meats, which include chicken, turkey, mutton, pork and bush meat, the consumption expenditure depends on income, age sex and years of schooling. The coefficients of income, age, gender and years of schooling are positive. This indicates that consumption of other meats increases with income, age and years of schooling. The positive coefficient of

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gender signifies that male-headed households consume more of other meats than female-headed household. This result is in consonance with the findings of (Durojaiye and Olubanjo, 1987 Nayga 1994, Adelaja, 1997).

Table 3a: Consumption of Animal and Plant Protein Source Food

VARIABLE	Total protein	Animal protein source food (APSF)	Plant protein source food (PPSF)
CONSTANT	-348.70 (-0.28)	-985.96 (-0.78)	637.26** (1.93)
HOUSEHOLD INCOME	0.131*** (16.38)	0.120*** (14.07)	0.0118*** (5.56)
HOUSEHOLD SIZE	745.90*** (3.58)	689.29*** (3.26)	56.609 (1.02)
AGE	-3.1993 (0.14)	1.1637 (0.05)	-4.3630 (0.73
GENDER	-508.67 (-0.86)	-516.40 (-0.87)	7.7279 (0.05)
SCHOOLING	89.568* (1.92)	88.523* (1.87)	1.0458 (0.085)
SINGLE	282.99 (0.30)	260.24 (0.27)	22.756 (0.09)
SINGLE PARENT	-159.82 (-0.23)	-153.34 (-0.21)	-6.4858 (-0.03)
LOG OF LIKELIHOOD	-1100.22	-1101.87	-941.184
R^{-2}	0.83	0.80	0.29

Source: Computed from field survey (2006)

(b) Consumption of Plant Protein Source Food (PPSF)

The R^2 for plant protein consumption is 29%, which is very low, compared with that of animal protein consumption, reflecting that only 29% of the variations in plant protein consumption iss due to the explanatory variables. The result presented in Table 3a further shows that plant protein consumption is positively and significantly influenced by household income. The marginal propensity to consume plant protein is 0.01, indicating that if there is one naira increase in the household income; 1kobo will be devoted to animal protein consumption. Consumption of individual components of plant protein, beans and other plant proteins is a function of household income. Other explanatory variables have insignificant influence on their consumption.

In the final analysis, the data of both APFS and PPFS were pooled together with the aim of assessing the determinants of protein consumption in the study area. The result is presented in Table 3a. The result shows that 83% of the variations in protein consumption are explained by the independent variables that are in the model. Household income, household size and years of schooling are the variables that have significant positive effects on protein consumption in the study area. These results agree with the findings of Lutz *et al* (1993), Nayga, (1994), Adelaja *et al,* 1997).

The marginal propensity to consume proteinous food is 0.13, implying that thirteen kobo (13k) from every additional naira to the income was devoted to the consumption of proteinous food. The coefficients of household size and years of schooling suggests that consumption of proteinous food will increase by ₦745.90 and ₦89.57 respectively, if the household size increases by 1 person and the year of schooling increases by one year.

Table 3b: Determinants of Consumption of Animal Proteinous Foods

Variables	Beef	Other meats	Fish	Milk	Eggs
Constant	-563.71 (-0.7022)	-777.82 (-1.53)	-335 (0.52)	55.61 (1.55)	135.14 (0.98)
Household Income	0.0446*** (8.57)	0.019*** (5.96)	0.029*** (7.11)	0.018*** (7.95)	0.007*** (8.06)
Household Size	663.04*** (4.92)	-113.20 (-1.32)	114.58*** (1.06)	7.334 (0.12)	17.533 (0.76)
Age	-23.173 (-1.59)	19.834** (2.15)	18.932 (1.62)	-10.423 (-1.61)	-4.0070 (-1.60)
Gender	-554.89 (-1.46)	405.94* (1.68)	-133.85 (-0.44)	-178.260 (-1.05)	-55.338 (-0.85)
Years of Schooling	-16.284 (-0.54)	42.830*** (2.24)	32.16 (1.322)	15.965 (1.19)	13.843*** (2.67)
Marital status	951.86 (1.56)	-299.25 (-0.77)	97.34 (0.20)	-368.230 (-1.36)	-121.48 (-1.16)
Single parent	324.23 (0.71)	-365.970 (-1.26)	-54.066 (-0.15)	-106.380 (-0.52)	48.844 (0.62)
Log of likelihood	-1048.03	-993.417	-1022.11	-950.976	-836.804
R^2	0.59	0.41	0.49	0.50	0.55

Source: Computed from field survey (2006)

CONCLUSION

This study was carried out in Remo division of Ogun State, Nigeria. The main focus of the study was the consumption pattern of proteinous food. The study utilized primary data which was analysed using descriptive statistics and ordinary least square regression techniques. Three regression analyses which include the determinants of plant protein source food and animal protein source food and that of the pooled data were carried out. The result shows that a small proportion of monthly household disposable income was devoted to consumption, and as expected, average propensity to consume animal protein is higher than that of plant protein. In a broad perspective, disposable income, household size and years of schooling are the major determinants of protein consumption. The marginal propensities to consume animal protein and plant protein are ₦0.12 and ₦0.01 respectively. On the basis of these findings, it is imperative that the Remo division dwellers in Ogun State and by extension Nigerians should increase their protein consumption, and this can only be achieved if there is increase in the purchasing power of Nigerians.

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