Animal protein consumption among rural households in Kwara State, Nigeria

A. Muhammad-Lawal and G. S. Balogun

Department of Agricultural Economics and Farm Management, University of Ilorin, P.M.B. 1515, Ilorin, Nigeria

ABSTRACT: The main objective of this study is to examine rural households' animal protein consumption in Kwara State. The data used for this study were obtained through a three-stage random sampling technique. Multiple regression analysis was used for this study. The study shows that household size and food expenditure are the significant variables affecting animal protein consumption among rural households in the study area. This study suggests the need for rural households to adopt modern family planning. Besides, it also recommends that rural households should be assisted to diversify their sources of income from agriculture.

Key Words: Meat consumption; Animal protein; Rural households; Kwara State; Nigeria.

Introduction

In Nigeria, food supply is not distributed equally throughout the country and sometimes within the households. Poverty being a major cause of hunger throughout the country, rural population are especially prone to malnutrition and malnourishment as the majority of them are more likely to be poor. A large proportion of the populace including children, do not receive enough calories to ensure physical health and development. Most people consume the minimum level of calorie but fail to get necessary protein and essential vitamins and minerals required for leading a healthy life (1).

Proteins are the major structural components of all cells of the body and amino acids are the building blocks of protein. Proteins can function as enzymes, membrane-carriers and hormones (2). As far as the human body is concerned there are two different types of amino acids: Essential and Nonessential. Nonessential amino acids are amino acids that the body can create out of other chemicals found in the body. Essential amino acids cannot be created, and therefore, the only way to get them is through food. .Protein contain approximately 22 amino acids, eight of which are essential because the body can not produce them. Therefore, they must be obtained from our food. The sulphur – containing amino acids: methionine, cystine and cysteine are particularly important for the health of the brain and nervous system (3). Protein is required for the growth, maintenance and repair of all body tissues.

Proteins are the building blocks of human life, essential for normal growth. Protein is 90% of the dry weight of blood, 80% constituent of enzymes, hormones and antibodies (4). Proteins encompass many important chemicals including immunoglobulin and enzymes. In short, they form the foundation of muscles, skin, bone, hair, heart, teeth, blood and brain and the billions of biochemical activities going on in

our bodies every minute. When we fail to consume adequate amounts of protein, the blood and tissues can become either too acidic or too alkaline. Lack of dietary protein can retard growth in children and in adult, can be a contributing factor in chronic fatigue, depression, slow wound healing and the decreased resistance to infections (5).

Man obtains his necessary proteins from either animal or vegetable source. The meat from cattle, goat, sheep, pig and poultry including the offal are the main sources of daily per capita consumption of animal protein (6). According to (7), the main difference between animal protein and plant protein is that animal products contain different ratios of amino acids and higher concentrations of protein than most plant products do. Most plants contain proteins in lower levels. Hence in a strictly vegetarian diet, it is important to mix and match different plants to get the variety of protein and amino acids necessary for good health. Animal proteins however are said to possess superiority over vegetable protein. Animal proteins are generally referred to as complete proteins. They contain all the amino acids needed in the body as opposed to plant proteins in which one or more of these essential amino acids are lacking (8). Besides, animal protein is the only source of complete protein available. Animal sources of protein have many advantages over vegetable sources because vegetable sources are typically low in one or more of the essential amino acids even when overall protein content is high. There is now some controversy regarding the safety of some vegetable products which is thought by some researchers to be high in mineral-blocking phytates and thyroid depressing phytoestrogens and potent enzymes inhibitors which may depress growth. On the other hand, animal protein especially if obtained from good sources like goat's milk are easier to digest and are substantially less allergenic than other sources (9).

It has been estimated that the daily minimum crude protein requirement of an adult in Nigeria varies between 65 and 85g per person. However it is recommended that 35g of this minimum requirement should be obtained from animal products (10, 11, 12). A review of the data of food supplies available for consumption in different countries shows that the per caput protein intakes in developing countries, Nigeria inclusive, is comparatively low. Not only is the total protein supply deficient but the quality of dietary protein available is inferior to that consumed in developed countries(13). Most of the foods consumed in Nigeria are carbohydrates which are obtained mainly in the form of starch (8).

Statement of the problem

Increases in protein consumption appear to be more important than energy consumption for ameliorating growth failure. A major possible reason for this is that the distribution of energy and protein to individuals within a population almost certainly differs substantially, with protein especially animal protein much more unequally distributed than energy (14). The consequence of this poor nutritional status is infection which will eventually result in weakness, lethargy, absenteeism, poor productivity and stress.

Objectives of the study

The main objective of this study is to examine rural households' animal protein consumption in Kwara State.

The specific objectives are:

1.   to estimate the level of animal protein consumption among rural households.

2.   to determine the factors affecting households' animal protein consumption.

Research Methodology

Area of Study

This study was conducted in Kwara state, Nigeria. Even though there are forested region in the Southern part, Kwara state consists mostly of wooded savannah. The state is one of the nation's least densely populated regions of the country. It has an estimated population of 3,745,000 majority of whom are engaged in farming (15). With a total of sixteen local government areas (LGAs), Kwara state has a total

land size of about 32,500km^2. The topography is mainly plain lands to slight gentle rolling. The annual rain fall ranges between 1000mm and 1500mm and the average temperature ranges between 30°c and 35°c (16).

Sampling Method

Kwara state is divided into four zones by the Kwara state Agricultural Development Project (KWADP) in consonance with ecological characteristics, cultural practices and project administrative convenience.

The zones are as follows:-

Zone A: Baruteen and Kaima local government areas; Zone B: Edu and Patigi local government areas.

Zone C: Asa, Ilorin East, Ilorin South, Ilorin West and Moro local government areas.

Zone D: Ekiti, Ifelodun, Irepodun, Offa, Oyun, Isin and Oke-Ero local government areas.

The population for this study comprises of all rural households in Kwara state. A three-stage sampling technique was used in selecting the sample for this study. The first stage involved a random selection of two zones from the four agro ecological zones in Kwara state. The second stage involved a random selection of six villages in each of the selected zones. The third stage involved a random selection of ten households from each of the selected villages. A total of one hundred and twenty households was thus selected for this study.

Sources of Data

The data for this study was obtained from both primary and secondary sources. The main instrument used for collecting primary data was a well structured questionnaire. The secondary sources of data on the other hand include annual reports and materials whether published or unpublished such as journals, magazines and texts.

Methods of Analysis

This study was analysed using two methods. The first method is the simple descriptive statistics which includes a measure of central tendency such as mean, percentages, frequency distribution and tabulation of data. The second method involves the use of multiple regression model.

Model specification

The model specified for this study is adapted from the Ordinary Least Square regression model used by (17) to determine the effect of the socioeconomic factors such as income, prices of food, family size, educational attainment and age of the household head and urbanization on food nutrient consumption of rural and urban households in Ondo State of Nigeria.

The model is expressed thus:

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

Where, Y = Daily per capita animal protein consumption in gram. This was determined using the protein content of the animal products consumed by the entire household members.

X_1 = Household size. It is expected to have negative effect on daily per capita animal protein consumption.

X_2 = Gross monthly income. (₦). It is expected to have positive effect on daily per capita animal protein consumption.

X_3 = Monthly food expenditure of household (₦).It is expected to have positive effect on daily per capita animal protein consumption.

X_4 = Dependency ratio. It is expected to have negative effect on daily per capita animal protein consumption.

X_5 = Livestock production (Tropical Livestock Unit TLU). It is expected to have positive effect on daily per capita animal protein consumption.

u = Error term that is assumed to be normally distributed with zero mean and constant variance. It represents variations that are due to variables not specified in the model.

The following production functions fitted to the data:

(1) Linear Function: $Y = a_0 + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5$
(2) Semi – log Function: $Y = a_{0\,+}\,b_1logx_1 + b_2logx_2 + b_3logx_3 + b_4logx_4 + b_5logx_5$
(3) Cobb-Douglas Function or Double-log Function:

$Log\,Y = a_0 + b_1logx_1 + b_2logx_2 + b_3logx_3 + b_4logx_4 + b_5logx_5$

(4) Exponential Function: $Log\,Y = a_0 + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5$

Where: Y = dependent variable; a_0 = Intercept; b_i = Regression coefficients of the independent variables

X_i at i = 1, 2,3,4,5. It shows how the dependent variable varies based on the input level of the independent variables.

The criteria used in selecting the functional equation that gave the best fit for the regression included: (i) highest R^2, (ii) highest number of significant variables, (iii) highest F value and (iv) conformity to the apriori expectations of the regression coefficients.

Results and Discussion

The study shows that the average monthly income distribution of the households in the study area was ₦ 22118.00. About 60% of the respondents had monthly income less than this mean. This implies that the bulk of the respondents can be regarded as low income earners. This situation, coupled with the average household size being six and a mean dependency ratio of .6653, has the consequence of low protein consumption among the households in the study area.

Animal protein consumption

Table1 shows that beef is the major source of animal protein supply among rural households. It accounts for more than one-third of dietary protein consumption in the study area. A mean of 17.82g daily per capita animal protein consumption was observed among the rural households in the study area. The major sources and contribution of animal protein consumed by the rural households are as presented in table 1.

Table1: Rural household animal protein consumption

Animal protein sources	Contribution to daily per capita animal protein (g)	Percentage (%)
Beef	7.34	41.17
Fish	4.19	23.53
Egg	2.10	11.76
Goat meat	2.10	11.76
Chicken	1.05	5.88
Mutton	.62	3.53
Pork	.42	2.35
Total	17.82	100

Source: Field survey, (2004)

Correlation analysis

Table 2 shows the Pearson correlation between the daily per capita animal protein consumption (Y) and the explanatory variables which include household size (X_1), gross monthly income (X_2), monthly food expenditure (X_3), dependency ratio (X_4) as well as livestock production (X_5).

Table 2: Correlation Matrix

	X_1,	X_2,	X_3,	X_4,	X_5,
X_1	1.000	0.163	0.155	0.552	0.068
X_2		1.000	0.545	-0.083	0.352
X_3			1.000	0.037	0.123
X_4				1.000	0.089
X_5					1.000

Source: Data analysis, (2004).

It can be inferred from table 2 that there is no problem of multicollinearity between the variables fitted to the study.

Regression results

The results of the regression analysis are as presented in table 3.

Forms of equation	Constant	Regression coefficients					R^2	F
		X_1	X_2	X_3	X_4	X_5		
Linear	16.354	-.502	.0000212	.000672	-3.209	-.316	.635	39.707
		(.129)	(0.000)	(0.000)	(1.747)	(.318)		
		-3.890*	1.175	10.474*	-1.837	-.995		
Semi-Log	-39.5	-8.201	1.601	14.309	-5.354	-.913	.663	31.896
		(2.164)	(1.784)	(1.823)	(3.394)	(.318)		
		-3.789*	.898	7.848*	-1.578	-1.459		
Double-Log	-.152	-.213	.00407	.389	-.105	-.0213	.684	35.074
		(.052)	(.043)	(1.823)	(.081)	(.015)		
		-4.124*	.096	8.934*	-1.303	-1.427		
Exponential	1.21	-.0116	.00000005	.0000195	.0963	.00435	.606	32.001
		(.003)	(.000)	(.000)	(.045)	(.008)		
		-3.503*	-.103	10.434	-2.15*	-.535		

Source: Data analysis, (2004)

Note: Figures in the parentheses are the standard error and those in below them are the t- values.
* t- values significant at 5%.

As shown in table 3, it can be seen from the results of the regression analysis that the coefficients of multiple determination R^2 rages from 0.606 to 0.684 showing that all regressors account for between 60.6% to 68.4% of the variability in the values of daily per capita animal protein consumption.
Of the four functional forms of equation that were specified: linear, semi log, Cobb Douglas and exponential functions, Cobb Douglas function was chosen as the lead equation because it has the highest R^2 and conform to apriori expectations of the regression coefficient; was estimated as

Log Y = 0.152 – 0.213logX$_1$ + 0.00407logX$_2$ + 0.389logX$_3$ – 0.105logX$_4$ – 0.0213logX$_5$.

The value of the coefficient of multiple determination R^2 which was 0.684 indicate that 68.4% of the variation in household animal protein consumption could be explained by the explanatory variables while the remaining 31.6% was due to other factors not specified in the model.
At 5% level of significance, gross monthly income, dependency ratio and livestock production were not significant and it could be due to various reasons. Higher gross monthly income may imply higher expenditure on non food items. Also the dependants may be given equal access with the other members of the household to the available food, particularly animal products. Lastly, people may not keep livestock for food consumption but possibly for income.

Summary

The study revealed that average rural household consume a total of 17.79g of animal protein per capita per day. This was achieved by households with an average of 6 members with a dependency ratio of .6653, ₦24,118.99 gross monthly income, ₦8192.53 monthly food expenditure, and consumption of .5918 tropical livestock unit corresponding to 142.03kg of animal product.

Observed consumption pattern of the various sources of animal protein by the respondents shows that most of them consumed more of beef, followed by fish, and then egg while other animal protein sources followed in smaller quantities. The low level of animal protein consumption among the rural households could be attributed to their high household sizes.

Conclusion

Considering the findings of this study, the consumption of animal protein is seen to be lower than the minimum recommended level for healthy living. In view of the nutritional and economic importance of animal protein, effort should be made to improve the level of animal protein consumption among rural households who constitute a large proportion of the population of the state.

Recommendations

Since from the research findings, it is seen that household size is negatively correlated with daily per capita animal protein consumption rural households should be assisted to adopt modern family planning techniques. Besides, they should be assisted to diversify their sources of income from agriculture. This may enable them earn more cash income required to increase their food expenditure.

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