CONSUMPTION PATTERN OF SHEEP AND GOAT MEAT IN IBADAN METROPOLIS: IMPLICATION FOR FOOD AND NUTRITION POLICIES

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Targe Audience: Nutritionists, policy makers, researchers.

ABSTRACT

The study examines the consumption pattern of sheep and goat meat in Ibadan Metropolis and its implication for food and nutrition policies. Cross sectional data were collected from 121 households in Ibadan metropolis with a view of analysing the functional relationship between sheep and goat meat consumption and some socio economic variables of the household.

The study revealed income to be a major determinant of household goat meat consumption while other factors like household size, age and educational status· were secondary determinants. On the other hand, income was not a significant factor in household sheep meat consumption. Rather, household size, age and educational status, price of substitute and taste were major determinants. The regression results showed income to be statistically significant at 1% (P<0.01) and 5% (P<0.05) for goat. Household size and educational status were significant at 1% (P<0.01) while age was significant at 5% (P<0.05) for both meat types. However, taste coeficients were negative for sheep meat. The elasticities with respect to explanatory variables were inelastic for household size, age, price of sheep/goat and price of substitute this implying that explanatory variables are important factors and necessary condition determining the consumption of sheep and goat. The findings of the study point to the need for redistribution of income to favour the low income group. There is also a need for increasing domestic production of sheep and goat in the country through deliberate government efforts and the participation of the private sectors and NGO's in development plans.

Key words : Consumption, household, nutrition, policies

DESCRIPTION OF PROBLEM

One of the greatest problem confronting millions of Nigeria today is lack of adequate protein intake both in quality to feed the nations ever growing population. This inadequacy results in problem of malnutrition. A 1991 survey conducted by the Federal Ministry of Health and UNICEF showed that malnutrition remains the most serious health problem in Nigeria. The resultant effect of serious deficiency in the amount of protein intake is that people's health is adversely affected; particularly the mental capability, working productivity and eventually the overall national economic growth (1). At

present, an average Nigerian consumes about 48 grams protein per day of which only 13 grams is from animal sources. This figure fall shorts of international standard of 65 grams of protein per person per day (2).

In view of Nigeria's nutritional problems, the importance of sheep and goat usually referred to as "Small Ruminants" has been recognized. They are not only advantageous to man during the period of cyclical and unpredictable food shortages but also adapted for balancing the energy and protein supply during normal variations occuring over the years (3). Sheep and goat also owe their existence to the fact that they can thrive as meat producers under conditions which other domestic animals may find difficult to thrive on (4).

Sheep and goat are multi-purpose animals that produce milk, meat and skin. Out of these products, meat is the major form in which sheep and goat are consumed in Nigeria. The trend in consumption pattern of sheep and goat in Nigeria cannot be easily ascertained. One major reason for this is that the record of local breeds consumed by individuals are rarely kept, since they do not pass through the government abattoirs for slaughter. Nevertheless, in the south-western part of the country, sheep are noticeably consumed in high quantities during Islamic festivals while the consumption of goat is peculiar to ceremonies such as birth ceremonies, death ceremonies, marriage celebrations and other festivals. Also there is a large movement of the animals from the north to the south by traders indicating that a vast market exist in the south. The demand for goat is therefore consistently high in the south while that of sheep is subject to festival fluctuation. Goat meat (chevron) is preferred to sheep meat (mutton) in many parts of Nigeria. The preference for goat meat is due to special features which makes it different from sheep i.e taste and aroma. Besides, while fat is distributed all over the body of sheep, fat concentration in goat.is a characteristics of the viscera (5). In the quest for solution to the problem of food security and malnutrition in Nigeria, a study was conducted in the South-Western part of the country to determine the consumption pattern of 'sheep and goat by various income groups in the region.

MATERIALS AND METHODS

The study was conducted in Ibadan Metropolis. Ibadan is an important commercial centre attracting vaious people from different parts of the counry. The city is densely populated with the estimated figure put at 1,222,570 (6). Data were collected by administering 150 well structured questionnaires. However, based on the adequateness of information received from respondents, data from 121 questionnaires were finally used for analysis. A single stage stratified random sampling tecnique was used to select the sample needed for analysis. This involves stratification of the study area into cells after which random selection of the household from each of the cells was done. The recommended FAO(2) nutritional survey procedure based on total number of household in each area of study and size of sample (150) required for study was used to determine the size of the sample selected in each of the

cells areas. Eighty eight (88) households were drawn from the high density area; while 38 and 24 were obtained from the medium and low density areas respectively. Data relating to income distribution, sheep and goat consumption pattern and other socio-economic characteristics were obtained from the sample households. The least square mutiple regression analysis was used to examine the relationship between exogenous and endogenous variables as well as obtain estimates of elasticities.

The general form of the model for analysis is given by;

$$Yi = F(X_1, X_2, X_3, X_4, X_5, D1, D_2, D_3, D_4, ei)$$

where

$Yi = Y_1$ or Y_2

Y_1 = Total Consumption of sheep per caput per kilogramme per month

Y_2 = Total Consumption of goat meat per caput per Kilogramme per month

X_1 = Food expenditure per caput per month (₦)

X_2 = Household size

X_3 = Age

X_4 = Price of sheep or goat in Kilogramme

X_5 = Price of substitute(Beef) in Kilogramme

D_1 = Income group dummy (middle income = 1 low and high income = 0).

D_2 = Income group dummy (High =income = 1 low and middle Income = 0).

D_3 = Dummy variable for education (Formal = 1 Non-Formal = 0).

D_4. = Dummy for Taste (Aroma = 1, otherwise = 0)

ei; = Error term

The independent variables are assumed to be non-serially correlated, hence the problem of multi-collinearity is assumed to be minimal. Four types of functional forms were experimented with. These were linear, exponential, semi-log and double-log functions. The choice of a lead equation among all fitted equations was hinged on theoretical criterion, statistical significance of the coeficients and the magnitude of the r-square (R^2). Olayemi (7) had suggested appropriate check on the aforementioned criteria for correct signs and plausible magnitudè as dictated by theoretical consideration or a prior expectation.

RESULTS AND DISCUSSIONS

Income Distribution of Household

The income level of households is a major determinantion of food consumption and the nutritional status of the household. Aggregate monthly disposable income was used as a measure of household's purchasing power. Households were grouped into 3 major income groups which are low, middle

and high income groups. The average monthly income of the low income group (83) which accounted for about 69% of the sampled household amounted to about N5,828. Twenty two households accounting for 18% of total households sampled were in the income group with average monthly income of N12,944 while 16 households (13%) sampled fell within the high income group and had average income of N22,650 (Table 1). The highest income obtained from the survey was N35,000 while the lowest was N1,200. The findings suggest that over half of the population in the study area fall within the low income group.

Table 1.   Distribution of Household by Income Group and Average Monthly Income

Income Group	Income Range (N)	No. of House-holds	% Distribution Household (N)	Total Monthly Income (N)	Average Monthly Income	% of Total Income
Low	< 10,000	83	68.6	483,724	5,828	43.0
Middle	10000-15000	22	18.2	280,568	12,944	24.9
High	> 15,000	16	13.2	362,200	22,650	32.1
Total		121	100	1,126,492		100

Source: Field Survey, 1999.

Household Expenditure on Food, Sheep and Goat

Most consumption studies reveals food as taking a large proportion of consumption expenditure among low income households and a lower proportion among high income households. A similar trend was observed among the households sampled. Average monthly expenditure on food by low income households (N3,739) was smaller than those of middle income (N6,739) and high income (N10,029) households respectively Table 2 shows that the expenditure on goat meat increased as income increased while the expenditure on sheep meat decreased with increase in income. The proportion of monthly expenditure on sheep (4.66%) by low income households was more than that on goat (2.8%) whereas, the proportion of monthly expenditure on goat (3.8%) by high income group outweighed that on sheep (2.2 %) and likewise, the proportion of monthly expenditure on goat (2.9 %) was great than that of sheep (2.4 %) among middle income group. This shows that middle and high income group spent more of their income on goat comsumption. This might be due to the toughness and the palatability of goat meat. Besides, majority of the middle and high income groups were affluent and may wish to avoid excessive fat content of the sheep meat.

Table 2: Average Monthly Expenditure on Food, Sheep and Goat by Income Group

Income Group	Average Mothly Exp. on Food (N)	Average Monthly Exp. on Sheep (N)	Average Monthly Exp. on Goat (N)	% Monthly Exp. on Food	% Monthly Exp. on Sheep	% Monthly Exp. on Goat
Low	3,737	268.7	168	64.2	4.6	2.8
Middle	6,739	310	381.2	52.7	2.4	2.9
High	10.029	488.7	872.5	44.3	2.2	3.8

Source: Field Survey, 1999.

Regression Analysis

Although many researchers (8, 9) have used double log, semi-log and linear functions in consumption studies, it was feasible to limit the function to the exponential form in this study. This was determined by the R^2, T-ratio obtained from the equation, the number of satistically significant variables and the economic theory of consumption expenditure pattern. The results of data analyses for each of the functional forms are shown Tables 3 and 4.

Explicity, the functional equation of the exponential function for sheep and goat is given as:

$logY_{(Sheep)}$ = 15.10 + 0.7080x1 + 0.792x2 + 2.487x3 + 1.494x4 + 5.272x5
(-0.0991)(0.623) (2.661) (1.68)　　　　　(0.170)　(1.74)
+ 0.095D1 + 0.118D2 + 0.602D3 + -0.589D4
(0.56)　　+ (0.49)　+ (2.72)　+ (-4.09)
$R^2 = 0.616$
F = 9.27

$logY_{(Goat)}$ = -2.773 + 0.286x1 + 1.190x2 + 1.314x3 + -0.151x4
(-0.73) (0.43) (8.16) (2.73 (2.59) (-0.08)
+ 0.494 + 0.17D1 + 0.329D2 + 0.323D3 + 0.326D4
(0.32) (1.66) (2.73) (2.59) (-0.398)
$R^2 = 0.730$
F = 33.6.

* Values in parenthesis are the T-values.

The value of coefficient of determination (R^2)was 0.616 for sheep while that of goat was 0.730. This shows that included variables accounts for 62% of the variation in household sheep consumption expenditure while 73% variation is explained in the consumption of goat. The F-value obtained for sheep (9.27) and for goat (33.6) indicate that the overall equation is statistically significant at 1%(P<0.01) level. The coefficients of household size (X_2) was

Table 3: Regression Results and Elasticities on Sheep Consumption

Functional Forms	Constant Terms	Regression Coefficients									R^2	AdjR	F
		X_1	X_2	X_3	X_4	X_5	D_1	D_2	D_3	D_4			
Exponential	-15.107	0.708 (1.137)	0.792*** (0.297)	2.487*** (1.478)	1.494 (8..679)	5.272** (3.022)	0.095 (0.170)	0.118 (0.240)	0.603*** (0.221)	0.589*** (0.144)	0.616	0.549	9.270
Linear	-0.928	1.5×10^{-4} (1.9×10^{-4})	2.3×10^{-3} (4.3×10^{-2})	6.5×10^{-3} (8.3×10^{-3})	1.5×10^{-3} (8.3×10^{-3})	5.5×10^{-3} (3.8×10^{-3})	3.6×10^{-2} (0.134)	-3.12×10^{-2} (0.219)	-0.345** (0.170)	-0.331*** (0.111)	0.289	0.166	2.348
Double-log	-8.721	0.163 (0.187)	-0.328 (0.234)	0.613 (0.409)	-0.004 (1.702)	1.009* (0.616)***	0.0886 (0.168)	0.040 (0.247)	0.577*** (0.219)	-0.583*** (0.143)	0.374	0.266	3.452
Semi-log	-12.419	1.062 (1.122)	-0.450 (0.293)	2.217 (1.459)	-0.474 (8.564)	4.737 (2.982)	0.093 (0.168)	0.031 (0.237)	0.5871*** (0.218)	-0.591*** (0.142)	0.376	0.268	3.476
Elasticities		10.211			0.755	0.883							

Source Computed from field survey.

Note   *** Significant at 1% (P<0.01)

      ** Significant at 5% (P<0.05)

      * Significant at 10% (P<0.1)

Elasticities obtained from the lead equation

Values in paranthesis are standard errors.

Adj R rep Adjusted R^2

Table 4: Regression Results and Elasticities on Goat Consumption.

Functional Forms	Constant Terms	Regression Coefficients											
		X_1	X_2	X_3	X_4	X_5	D_1	D_2	D_3	D_4	R^2	AdjR	F
Exponential	-2.773	0.286 (0.660)	1.190 (0.145)	1.314 (0.750)	-0.151 (1.690)	0.494 (1.553)	0.712** (0.103)	0.329*** (0.103)	0.323*** (0.089)	-0.326 (0.067)	0.730	0.709	33.670
Linear	0.249	-1.410^{-5} (1.3×10^{-5})	$-1.8x^{-3}$ (1.03×10^{-2})	4.0×10^{-3}*** (2.4×10^{-3})	-6.3×10^{-5} (1.0×10^{-3})	9.710^{-5} (1.32×10^{-3})	0.089*** (0.044)	0.147*** (0.051)	0.076** (0.939)	-0.004 (0.029)	0.268	0.209	4.559
Double-log	-2.345	0.052 (0.091)	-0.014 (0.1111)	0.298** (0.204)	-0.111 (0.329)	0.091 (0.319)	0.161** (0.099)	0.253*** (0.118)	0.221*** (0.086)	-0.032 (0.65)	0.265	0.205	4.491
Semi-log	-3.238	0.556 (0.635)	-0.026 (0.140)	1.107** (0.271)	-0676 (1.630)	0.509 (1.493)	0.15** (0.099)	0.242*** (0.116)	0.219*** (90.086)	-0.32 (0.064)	0.269	0.211	4.584
Elasticities	4.124				0.006	0.013							

Source: Computed from field survey

Note: *** Significant at 1% (P<0.01)

   ** Significant at 5% (P<0.05)

   * Significant at 10% (P<0.1)

   Elasticities obtained from the lead equation

   Values in parathesis are standard errors.

   Adj R rep ajacent R²

positive and statistically significant at 1% (P<0.01) level of probability in both equations thus implying that an increase household size will lead to an increase in sheep and goat consumption expenditure.

The coeficient of age (X_3) as positive and statistically at 5% (P<0.05) level. This shows that age of household head was directly linked to sheep and goat consumption expenditure. The coeficient of price of substitute (X_5) was positive and stastically significant at 5%(P<0.05)for sheep implying that as price of substitute for sheep which is beef, increased while price of sheep remained unchanged, more sheep meat was consumed by households. Income group dummies $(D_1$ and $D_2)$ for goat was statistically significant at 1% (P<0.01) and 5% (P<0.05) for high and middle income groups respectively, implying that both the high income and middle income groups. The coefficient of taste dummies (D_4) for both sheep and goat were statistically significant at 1% (p<0.01) level of probability. However, the coefficients was negative for sheep, thus suggesting an inverse relationship between taste and sheep consumption. The reasons may be that the tender nature and the peculiar odour of sheep meat and its excessive fat content distracts consumers. On the hand, consumers prefers goat meat because of its toughness and palatable aroma.

Educational status dummies (D_3)were positive and statistically significant at 1% (P<0.05) level of probability for sheep and goat. This suggest that educational status has positive influence on sheep and goat consumptions. As educational status increases, consumers become aware about the need for a balanced diet and the nutritional importance of protein.

Implications for Food and Nutritional Policies

The findings from this survey has brought issues that are of paramount importance and of relevance to Nigeria's development policies. The overall objective of Nigeria's food and nutrition policy is that improving household food security and guaranting that families have access to adequate food in both quantity and quality. It also aims to meet the nutritional requirements needed for a healthy body growth and development and thus improve the standard of living of the average Nigerian.

The study has revealed that the study area is basically a low income area and approximately half of the consumers do not have sufficient income to demand for sheep and goat meat. Furthermore, the positive effects of household size and educational status, point to the need for increased sheep and goat production in the country. Increasing domestic production of sheep and goat has been realised as one of the principal means of improving the daily per caput intake of sheep and goat meat, thereby improving the nutrition and contribution of the people to the overall economic growth of the country. The object of increasing sheep and goat production however will require deliberate government intervention in the following areas:

(i)   Increasing the capital investment allocation made to the livestock sector.

(ii)   Provision of improved transprotation facilities.

(iii)   Promotion of reaserch activitities in the sheep and goat livestock sector.

The aforementioned points will stimulate sheep and goat production and improve marketing channels. It will also address contraints and needs of producers and consumers alike.

There is a need to improve household food security among the low income group. This can be achieved by ensuring availability of staple food at the national, regional and household levels by enhacing household purchasing power. There is a need for increased assistance from external agencies to strengthen development activities or programmes in the area of food nutrition. Assitance should also be directed to support baseline studies for proper situation analysis in Nigeria.

CONCLUSION AND APPLICATIONS

1.   The consumption pattern of any food item is a complex subject that require a multi-disciplinary approach.
2.   As shown in this study, its was clearly revealed that income was a major determinant of sheep and goat meat consumption while factors such as household size, age and level of education were secondary determinants.
3.   It was also revealed that while food stuffs, sheep and goat meat were the major expenditure items for most of the households, the average monthly expenditure on sheep meat decreased with increased income while that of goat meat increased with increase in income among low, middle and high income groups.
4.   This study also indicate that the consumption pattern of sheep and goat meat were postively related to income, household size and level of education. This suggest that a redistribution in income will reduce the severity of poverty among income groups and provide an opportunity for substantial increase in sheep and goat meat consumption This will guarantee food security in Nigeria.

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