Research Article

Demand for Selected Livestock Products by Agricultural Households in a Rural Area (A Case Study of Obowo Local Government Area of Imo State, Nigeria)

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Abstract: The study examined the demand for selected livestock products by agricultural households in Obowo local government area in Imo state. Beef, chicken and fish were the livestock products selected for the study because they are commonly consumed by households. The objectives of the study were to determine the socio-economic characteristics of the respondent households, determine the amount of income spent by the households on the selected livestock products monthly, ascertain the household preferential characteristics for the livestock products, determine the factors responsible for their preference, determine the influence of the socio-economic characteristics of the respondent on the amount of income spent on the livestock products and to make recommendations based on the findings of the research work in the study area. Data were collected using a well-structured questionnaire which was administered to sixty- three (63) respondents randomly selected from the study area. Data analysis were carried out using descriptive statistics and regression model. Analysis of the socio economic characteristics of the respondents showed that the study area is dominated by male headed households which are majorly crop farmers with mean age of 57years, average household size of 6 persons and have poor educational level. The preferential characteristics of the respondent showed that (32%) of them preferred beef, (19%) of them preferred chicken and (49%) of them preferred fish. The study also emphasized that price (91%), income (86%), household size (75%) and health benefits (71%) were the major reasons for the household preferential choice. In the regression analysis, the linear function gave the best fit. The model showed that age, occupation, household size, educational level of the respondents had a positive influence on the amount spent on the livestock products while gender, marital status, household head had a negative influence on the amount spent on the livestock products by the respondents. . However, the research gives a better view of rural economy households demand pattern for livestock products particularly for the selected livestock products and the factors responsible for their preferential choice for the livestock products. Rearing of mini-livestock and local birds by households can reduce deficiency in animal source protein, government and policy makers can make policy intervention to stabilize fluctuations in prices of these livestock products.

Keywords: Demand, Livestock Products, Agricultural Households, Rural Area.

INTRODUCTION

Nigeria is a major hub of animal product consumption in West Africa. It is also one of the largest livestock-raising countries in the region (Gulbert et al., 2009). Meeting the ever-increasing domestic demand and access to these flourishing markets are major economic stakes for Nigeria and for the neighbouring Sahel countries that raise livestock.

By its population and capacity for animal production, with 25% of livestock herds in the sub-region, Nigeria is by far the leading livestock producer in Central and West Africa. The country's cattle herds are estimated at over 16 million head, far ahead of Niger (8.7 million), Mali (8.2 million) and Chad (7 million). The share of Sahel countries is significant, however, representing over 50% of total cattle herds. Cattle raising in Nigeria is largely supplemented by short-cycle livestock operations, estimated at 33.8 million head of sheep and 175 million poultry birds.(Guibert et al., 2009).

Livestock are classified into ruminant (cattle, sheep, goat and rams), non-ruminant (pigs, guinea pigs), poultry birds, fisheries and mini-livestock such as snails. Livestock production constitutes a very important component of the agricultural sector of developing countries, a contribution that goes beyond direct food production to include multipurpose uses, such as skins, fibre, fertilizer and fuel, as well as capital accumulation. Furthermore, livestock are closely linked to the social and cultural lives of several million resource-poor farmers for whom animal ownership ensures varying degrees of sustainable farming and economic stability.

Livestock production is the world's largest user of land, either directly through grazing or indirectly through consumption of fodder and feed grains. Globally, livestock production currently accounts for about 40 percent of the gross value of agricultural production (FAO 2012). In industrial countries, this share is more than half. In developing countries, where it accounts for one-third of the gross value of agricultural production, its share is rising quickly; livestock production is increasing rapidly as a result of growth in population and incomes and changes in lifestyles and dietary habits.

Livestock has an important contribution to food supply of rural and urban areas and contributes to the

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family nutrition, supplying animal protein. As household income increases, the consumption of protein increases, principally from animal origin, allowing the substitution of vegetal by animal protein. Besides milk, eggs and meat used as a source of food, other livestock products are used for domestic consumption and local sale such as skins, hides and horns.

Rural areas are home to most of the poor. According to ILO (2008), 88 per cent of the extreme poor live in rural areas, where poverty rates are four times higher than in urban areas and decent work deficits are typically severe. The rural/urban divide becomes even more apparent when considering poverty rates for people in employment. Nearly 20 per cent of people employed in rural areas live in extreme poverty, compared with just over 4 per cent in urban areas (WESO, 2016).

Rural areas are characterized by governance gaps and informality. Gender inequalities in rural areas are pervasive. If women in rural areas had the same access to agriculture assets, education and markets as men, agricultural production could be increased and the number of hungry people reduced by 100-150 million(ILO, 2008).

Livestock plays a crucial economic role for around 60 percent of rural households in developing countries including smallholder farmers, agro-pastoralists and pastoralists. It contributes to the livelihoods of about 1.7 billion poor people and 70 percent of those employed in the sector are women (FAO, 2012). Livestock, including dairy and other animal products, creates cash and in-kind incomes and enables savings for future needs. It can also provide transport of produce, fuel and people as well as inputs for crop production (traction power and manure). As a result, the sector plays a major part in reducing poverty, improving resilience as well as combating food insecurity and malnutrition.

Household demand for meat products such as beef, chicken and fish are faced with problems which is mostly due to market prices, consumers taste, credit availability and consumers income. These problems led to unbalance diet because meat contributes essentially to human's diet (Aromolara, 2004) and the consequence of this poor nutritional status is infection which will eventually result in weakness, lethargy, absenteeism, poor productivity and stress (Jamison & Leslie, 2001).

Rural households are faced with food security challenges in terms of livestock products. Large household size, price, low income earnings, illiteracy, low cost of plant protein products and lack of awareness on the importance of animal protein by rural households affects their demand for livestock products.

There have been an increasing pressure on the livestock sector to meet the growing demand for high-value animal protein. The world's livestock sector is growing at an unprecedented rate and the driving force behind this enormous surge is a combination of population growth, rising incomes and urbanization. Annual meat production is projected to increase from 218 million tonnes in 1997-1999 to 376 million tonnes by 2030 (WHO, 2015).

There is a strong positive relationship between the level of income and the consumption of animal protein, with the consumption of meat, milk and eggs increasing at the expense of staple foods. Because of the recent increase in prices, developing countries tends to decrease consumption of meat at much lower levels of gross domestic product than the industrialized countries. The growing demand for livestock products is likely to have an undesirable impact on the environment. For example, there will be more large-scale, industrial production, often located close to urban centres, which brings with it a range of environmental and public health risks. Attempts have been made to estimate the environmental impact of industrial livestock production.

Accelerated consumption of products of animal origin in our diets is a major solution to close the protein gap in Nigeria. This can be feasible through the promotion of livestock sub-sector which comprises of cattle, sheep, goats, pigs, poultry etc. The livestock industry serves as a source of high quality protein in form of meat, milk, eggs, cheese. However, there is still a complication which are consequences of many social and economic factors which make people to have discriminative attitudes towards the consumption of these various products. An instance of this is the religious or traditional taboo associated with the consumption of pork. There is therefore the need to undertake an assessment study of consumption pattern of animal protein among rural dwellers in the study area to bridge the animal protein gap among the very easily accessible sources of beef, chicken and fish.

Limited study has been carried out in Obowo local government area concerning livestock products. Varieties of livestock products (beef, mutton, chicken, pig, egg, fish, and snail) can be found in the study area which is Obowo, but most of the meat products are not produced in the locality but are imported from northern part of Nigeria.

Meat products are indispensable to rural people for regular or supplementary food supply and as a source of cash income. However, scientific investigations into improved use and conservation of meat have been inadequate. The output of this important food product is continuously declining to the extent that the household demand for it is no longer met. The main producers of meat are small scale farmers and many factors constraint the increased production of meat to meet household demand and the required empirical information on these factors are limited and this is a problem to answer by researchers and agricultural policy makers

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METHODOLOGY

The study was carried out in Obowo local government area of Imo state in Nigeria. . The council headquarters is located at Otoko. There are twenty-two autonomous communities in Obowo local government area. Avutu, Achingali, Umuariam/Achara, Alike, Amuzi, Okwuohia, Ihitte Uboma, Odenkwume, Umuoke, and Umungwa are towns in Obowo . It is surrounded by Ahiazu and Aboh mbaise local government area to the north and umuahia Abia state to the east.Obowo is located between Latitude: 5° 33' 22" N, Longitude:7°22' 38" E. It is located in the tropical savanna region of Nigeria. Obowo has a population density of 161,700 people, area size of 93.0 km² and density of 1,739/km². (Nigerian bureau of statistics 2016). It is a rural area characterized by a homogeneous population and lack of social amenities like good road network and portable water. The major occupation of the people are farming and fishing. They also produce palm oil, kernel, local baskets, brooms and rice. Sheep, goat, snail, pig, local birds, and grass cutters are livestock products that are found in Obowo.

Random sampling was used to select seven (7) communities in which three (3) villages was selected and three (3) households from each villages. Random sampling techniques was adopted for the study to give a total of sixty three (63) households interviewed for the study. Data were collected from primary sources which was collected using a well-structured questionnaire. Data were analyzed using descriptive statistics and ordinary least square model

The OLS model is specified as:
Y = f(X1, X2, X3, X4, X5, X6 , X7, ε)
Where;
Y=Total amount of income spent on the selected livestock product in Naria (N)
X1= age of household head (years)

X2= gender (1=male, 0=female)
X3= marital status (1= single, 2= married)
X4= household head (1=male, 2=female)
X5= occupation (1= crop farming, 2= livestock, 3=others)
X6= household size (number)
X7= level of education (years)
ε= stochastic error

Four linear forms (Linear function, semi-log, double log and exponential functions) were fitted to the data.

Linear function: $Y=\beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3\ldots+\beta_nX_n+\varepsilon$

Semi log function: $Y=\beta_0+\beta_1InX_1+\beta_2InX_2+\beta_3InX_3\ldots+\beta_nInX_n+\varepsilon$

Double-Log function: $LnY=\beta_0+\beta_1InX_1+\beta_2InX_2+\beta_3InX_3\ldots+\beta_nInX_n+\varepsilon$

Exponential function: $LnY=\beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3\ldots+\beta_nX_n+\varepsilon$

Where:
X_1-X_n= variables
β = estimated parameters
ε =Stochastic error

The lead equation was chosen based on the overall goodness of fit of the equation as expressed by the coefficient of determination (R2), significant level of the explanatory variables, and the appropriateness of the signs of regression coefficient based on apriori expectations.

RESULT AND DISCUSSION

Socioeconomic characteristics of the respondents. The result of the analysis of socioeconomic characteristics of the respondent households is presented in Table 1.

Table 1. Socioeconomic characteristics of f respondent households in the study area

Age(years)	Frequency	Percentage
20-29	3	4.8
30-39	5	7.9
40-49	8	12.7
50-59	11	17.5
60-69	20	31.7
70-79	16	25.4
Total	63	100
Mean	57years	
Gender		
Male	44	69.8
Female	19	30.2
Total	63	100
Marital status		
Single	5	7.9
Married	58	92.1
Total	63	100

Household head		
Male	44	69.8
Female	19	30.2
Total	63	100
Occupation		
Crop	39	61.9
Livestock	9	14.3
Other	15	23.8
Total	63	100
Household size		
0	5	7.9
1 – 3	5	7.9
4 – 6	27	42.9
7 – 9	21	33.3
10 – 12	5	7.9
Total	63	100
Mean	6persons	
Education level (years)		
No formal education	17	27
Primary (0 – 6years)	25	39.7
Secondary(7 – 12years)	13	20.6
Tertiary(13years above)	8	12.7
Total	63	100
Mean	6years	

Source: Field Survey data 2021

The table shows that majority (32%) of the respondent falls between the age of 60 – 69 years, (25%) of them are between 70 – 79 years, (18%) of them are between 50 – 59 years, (13%) of them are between 40 – 49years, (8%) of them are between 30 -39 years, (5%) of them are between 20 – 29years. The mean age was 57years which implies that most of the respondents are aged because the study area is a rural area which is dominated by aged people.

The table shows that (70%) of the respondents are males, while (30%) are females. This implies that the selected livestock products are demanded by both males and females but the households in the area are basically dominated by males.

This table shows that (92%) of the respondents are married while (8%) are single. This result implies that most respondents in the study area are married.

The table shows that (70%) of the respondent's households are male headed, while (30%) are females headed. This implies that the selected livestock products are demanded by both male and female headed households but most of the households are male headed.

The table shows that (62%) of the respondents are crop farmers, while (14%) are livestock farmers and (24%) are involved in other agricultural activities. This implies that the major occupation of the respondent in the study area is crop farming. The table shows that (8%) of the respondents has no persons in their households, (8%) has household size of 5 persons, (43%) has household size of 27 persons, (33%) has household size of 21 persons while (8%) has household size of 5 persons. The mean household size was 6 persons, which implies that the household has a moderate labour force. The table shows that (27%) of the respondents has no formal education, (40%) has primary education, (21%) has secondary education, while (13%) has tertiary education. This implies that majority of the respondents had primary education their time but were still limited in reading and writing.

Amount of income spent on the selected livestock products the respondents monthly.

The percentage distribution of the respondent according to the total amount of income spent on each of the selected livestock products by the household is presented in table 2.

Table 2. Household monthly expenditure on each of the selected livestock products

Livestock Product	Amount (₦)	Percentage of expenditure (%)
Beef	₦256,000	7.33%
Chicken	₦98,500	2.82%
Fish	₦279,000	7.98 %
Total income spent on the livestock product	₦ 633,500	18.13%

Source: field survey data, 2021

The table 2 shows that (7%) of the respondent monthly income are spent on beef consumption, (3%) on chicken and (8%) on fish consumption. It is seen that about (18%) of the respondent monthly income are spent on the consumption of the livestock products monthly. According to Robert & Juan (2012) in their study of household consumption of beef and fish in Imo State, find out that average household monthly consumption of beef and fish were 14.4kg and 27.21kg respectively. Fish has the highest percentage of expenditure by the respondents because it is cheaper than beef and chicken and since the study area is a rural area which is characterized by low income and poor standard of living, the respondents tends to source for fish as their animal protein because of its low cost.

Household preferences for the selected livestock products

The percentage distribution of the respondents according to the household preference for the selected livestock products and the factors responsible for the preference by the households is presented in table 3.

Table 3. Household preferences for the selected livestock products

Livestock products	Frequency	Percentage
Beef	20	31.7
Chicken	12	19.1
Fish	31	49.2
Total	63	100

Source: field survey data, 2021

The table 3 shows (32%) of the respondent household preferred beef, (19%) of them preferred chicken, while (49%) preferred fish. This implies that fish is the most preferred livestock product by the respondent household.

Factors responsible for the preference of the selected livestock products

The percentage distribution for the respondents according to factors responsible for the preference of the selected livestock products by the households is presented in table 4.

Table 4. Factors responsible for the preference of the selected livestock products

Factors responsible for the preference	Frequency	Percentage
Income	54	85.7
Price	57	90.5
Household size	47	74.6
Irregularity of the market	40	63.5
Taste	35	55.6
Health benefits	45	71.4
Others	30	47.6

Source: Field survey data, 2021

The results also show that price of the livestock products (91%), income of the respondents (86%), and household size of the respondent (75%) were the major reasons for their preferential choice for the livestock products.

Influence of socioeconomic characteristics of the respondent on the amount of income spent on the selected livestock products.

Table 5. Determinants of socio-economic characteristics of the respondents on the amount of income spent on the selected livestock products.

Explanatory variables	Linear function	Exponential Function	Cob douglas (double log) function	Semi-log function
Constant	-3558.064	8.151	2.318	-57538.350
	(-0.729)	(11.237)	(1.440)	(-3.241)
Age(years)x1	202.463	0.018	0.760	9122.192
	(2.426)*	(2.081)*	(1.669)	(-3.241)*
Gender(x2)	-5696.545	-0.751	-1.115	-8967.378
	(-3.401)*	(-4.613)*	(-4.761)	(3.595)*
Marital status(x3)	-9498.270	-0.403	0.036	-3916.508
	(-2.843)*	(-1.168)	(0.943)	(0.752)
Household head(x4)	-3127.322	-0.528	-0.437	-3879.347
	(-1.995)*	(-3.294)*	(-1.629)	(-1.311)

Occupation (X5)	1067.328 (1.340)	0.115 (1.432)	0.049 (0.292)	1022.347 (0.547)
Household size(x6)	1775.463 (3.973)*	0.144 (3.316)*	1.180 (3.887)*	10862.422 (3.245)*
Education(x7)	421.643 (3.155)*	0.034 (2.492)*	0.703 (3.446)*	5766.241 (2.561)*
R2 value	0.587	0.598	0.527	0.508
F-value	13.267	13.883	11.685	8.872
No of respondent	63	63	63	63

Source: Field survey data, 2021 *= 5% significance

The results of the four functional forms of multiple regression analysis on the influence of socio-economic characteristics of the respondents on the amount of income spent on the selected livestock products is presented in table 5. The seven (7) explanatory variables are age, gender, marital status, household head, occupation, household size, and educational level of the respondents. The estimated functions were evaluated in terms of the statistical significance of the coefficients of the multiple regression (R^2) as indicated by the F-value, the significance of the coefficients and the magnitude of the t-values and follow apriori expectations and economic rational. Based on these statistical and economic criteria, the linear functional form was selected as the lead equation with R^2 value (0.587), F- value (13. 27) and it is among the functional form with the highest number of statistically significant independent variables. From the linear functional form shown in table 4.10, the seven (7) independent variables fitted into the model are explained are explained as follows;

- **Age(X1):** It has a positive relationship with the amount of income spent on the livestock products. This implies that as the household head advances in age, they tend to be an increase in their household responsibilities (feeding, clothing, health care) which also increases their expenditure.
- **Gender(X2):** It shows a negative relationship with the amount spent on the livestock product. This implies that the gender of the household head in the study area influences the household expenditure negatively; male headed household spends more on the livestock products than female headed households.
- **Marital status(X3):** It has a negative relationship with the amount spent on the livestock product by the households. This implies that the marital status has an inverse relationship on the household expenditure; married households spends more than single households.
- **Household head(X4):** It has a negative relationship with the amount spent on the livestock products. This implies that household head has an inverse relationship on the household expenditure; male headed households spends more than female headed households.
- **Occupation(X5):** It has a positive relationship with the amount spent on their total household expenditure on the livestock products.

- **Household size(X6):** It has a positive relationship with the amount spent on the livestock products. This implies that as household size increases, the household expenditure also increases.
- **Education(X7):** It has a positive relationship with the amount spent on the livestock products. This implies that the level of education of the household heads increases due to their high level of educational qualification, they will tend to spend more on their household education, housing, feeding etc.

CONCLUSION

The demand for beef, chicken and fish in Obowo local government area in Imo state are faced with problems which is mostly due to prices, taste, income and household size. The study also shows that the socio economic characteristics has a significant relationship with the household expenditure on the livestock product.

However, the research gives a better view of rural economy households demand pattern for livestock products particularly for the selected livestock products and the factors responsible for their preferential choice for the livestock products. Information from the study will serve as a reference material to students, researchers and policy makers at both local, national, institutional levels. Finally the study will contribute to existing empirical information on animal protein demand for the use of stakeholders in the livestock industries towards ensuring adequate supply of fish, beef and other animal protein source to reduce protein malnutrition in the country at large.

Recommendations
- The rural households are more likely to keep small ruminants, local birds and mini-livestock than urban areas. This could be used as substitute to the selected livestock products to reduce deficiency in animal protein.
- Government and Policy makers should initiate price intervention policies and programme in order to stabilize the fluctuation in prices of these livestock products.
- Policy measures should also be made to increase the source of income of people in the study area which would increase their demand for the livestock products, hence, increasing their nutritional and health status.

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