

Profitability Assessment and Determinants of Sheep Production in Gombe Metropolis, Gombe State, Nigeria

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Abstract- The studies examine the profitability assessment and determinant of sheep production in Gombe metropolis, Gombe State Nigeria. Primary data were collected from fifty sheep producers using questionnaire and examined using gross margin and regression analysis. The result revealed a gross margin of (N12,724.38), return per Naira invested of the 4.11 and the operating ratio was 0.243. this indicated that the business is profitable. The regression analysis revealed that house hold size; educational status; feeding were significant at $P \leq 0.10$ and medication was significant at $P \leq 0.05$ in influencing sheep production in the study area.

IndexTerms—Profitability, Sheep, Production ,Assessment, Gombe

I. INTRODUCTION

1.1 Background of the Study:

Small holder management system has extensively dominated the small ruminant animal production in Nigeria. The animals predominantly reared by the groups of holders are sheep and goat. These animals are kept under extensive system of management mostly in rural area (Osuagwuh, 1985). Among the domesticated animals sheep has contributed immensely to the agro – ecosystem for the advancement of human civilization *Ovis aries* is the name given to sheep in latin and it evolved about 1.5 million years ago in West Asia and South – Eastern Europe (Gatenby, 2002). There are many breeds of sheep in the tropics, which have been developed to suit various environments sheep have tolerance to endemic diseases such as trypanosomiasis in humid part of West – Africa (Sumberg and Cassaday, 1985 and Wiener, 1994). The sheep breeds in Nigeria are meat producing animals adapted to various ecological zones in which they are found (FAO, 1982).

The indigenous breeds in Nigeria are Yankasa, Uda, Balami and West African Dwarf sheep are predominantly found in the Southern part of the country while the Yankasa, Uda and Balami are found in the Northern Guinea and Sudan Savannah up to Sahel (Adu *et al*, (1984) and Osinowo *et al* (1988). Environment has a significant effect on all system of livestock production. Sheep productions have been developed in response to the climate and other environmental factors in traditional system (Payne and Wilson, 1999). Clerk the most important environmental factors which limit production of sheep are management, population density, climate and whether. These factors have to be dictated before determining the management system that has to be used in sheep production (Otchere and Kallah, 1985).

However, there some systematic ways of grazing flocks of sheep, which the sheep producers used to adopt; extensive, semi intensive and intensive system. Sheep production systems have remain largely traditional in which free range or extensive system, consisting of tethering and herding. The extensive system enacts considerable hazards for the animals as there is inadequate health care, record keeping, no provision of housing, inadequate feeding, uncontrolled breeding and hence the performance of the animal is generally low (Olaluku, 1985). Feed is one of the most important inputs in sheep industry. Sheep feed on generally poor quality feed in traditional system of management in which the available food which pigs, poultry or humans could not consume could be used to feed sheep. Often the feed available to sheep is fibrous and deficient in energy, protein and some specific nutrient such as minerals (D' Mello and Devendra, 1986)

Sheep feed more on fine than coarse feeds and for this reasons, it is sometimes chopped. Feed intake depends on the energy density of the diet. Rumen micro – organism work faster than when the feed is chopping and increased the energy density which will lead to rise in feed intake. The dry matter intake of a 20kg sheep on a coarse diet varies from 0.3kg/day for poor quality feed to about 6k,g/day for good quality feed. There is high intake when the diet is fine. Dry matter intake 2.5 – 4% of body weight per day for ration composed of concentrated to roughage in a ratio of 40:60, of crude protein level of 15% and energy level of 2.7 meal/kg diets are option for maintenance and growth fifteen percent protein and energy level of 3.2 meal/kg diet and recommended for pregnant ewes (Olaluku, 1985).

Diseases in sheep used to cause decrease in reproductions and productive performance of animals, some of these diseases when they are chronic as regarded by the veterinarians and animal health workers, course low productivity of flock and sometimes might lead to death. These usually occur due to combination of factors, which includes inadequate feeding and low standard of management (Aliyu, 1997).

Housing in sheep production is very important. There are two major reasons that make sheep housing very important which are to give a better environment and to make management easier. Sheep thrive best in an environment which is neither too cool hot, neither dry nor muddy, protected areas against predators, insects and thieves. (Payne and Wilson, 1999).

In spite of the potentials for mutton as a sources of protein, sheep are mismanaged However, an attempt to prove the

production is based on improved technological transfer, where innovations are disseminated to the producers sheep have low management cost due their size, early maturity and short production cycle. Also they have ability to convert feeds that are not required by human beings to meat (Nura, 1985 and Abubakar 1998). Nigerians are consuming low level of animal protein that is recommended by FAO (1990) which is 34g per caput per day, in which only about 6.8g per put per day been recorded as animal protein intake of a Nigerian. Thus there is a need to increase supply of mutton to enhance protein consumption is Nigeria. sheep production needs only a small capital outlay in which producers will be able to start the business and managed it. When sheep production is increased the supply of meat (mutton) will meet the demand of consumers. Therefore, we will meet the recommended animal protein intake by FAO.

So, there is a need for study of sheep production to solve the problem of insufficient of animal protein supply in Gombe as well as the country at large.

However, with this study some facts will be discovered which will help in further research work and in the formation of effective agricultural projects. Like the World Bank project of poverty Eradication such as National Fadama Development project (NFDP).

Objective of the Study

The objective of the study is examined the profitability assessment and determinants of sheep production in Gombe Local Government Area, Gombe State.

II. METHODOLOGY

2.1 The Study Area

The study covers Gombe metropolis in Gombe Local Government Area of Gombe State

2.2 Location and Climate

Gombe Local Government is located between latitude 9⁰30' to 12⁰N longitude 8⁰45' to 11⁰45E in the North – Eastern Region of Nigerian, with a land with a land area of 20,260sq km. it has an annual temperature ranges from 13⁰C to 13⁰C (GSD, 2008). The annual average rainfall is 850mm with a duration ranging from 45 months. The population of Gombe Local Government is 1.85 million (NPC, 1996).

2.3 Vegetation and Soils

The vegetation cover of Gombe Local Government is described as guinea savannah grass land with concentration of wood land in the South East and South West (NPC, 1996). The vegetation types of the area consist of naturally growing trees such as *Azelia africana*. *Acacia*. *soye* and the rest (BSDP, 1982).

The topography of Gombe can be described as mountainous, undulating and hilly to South – East and open plains in the central, North West and north east (NPC, 1996).

2.4 Sampling Techniques and Data Collection

Random sampling was used to obtain 50 respondents. ie. Sheep producer they were selected from 10 out of 11 wards in Gombe LGA, which are Dawaki, Ajiya, Bajoga, Jekadafari, Kumbiya – kumbiya Herwagana, Pantami, Bolari West, Bolari East and Nasarawo.

The targeted populations in study are sheep producers, who produce sufficient mutton that increase the supply of healthy meat in the area.

Questionnaires were administered to producers to achieve the objectives of the study.

2.5 Data Analysis

The tool of analysis used in this research work include1

2.5.1 Farm Budget Model

This was adapted in the analysis to profitability or otherwise of the sheep enterprises in the study area through the estimation of total expenses as well returns . Total expenses refer to the total cost incurred, during production period, which is obtained by multiplying the variable inputs by their unit market price (Olukosi and Erhabor, 1988). Conversely, total revenue refers to the sum of output multiplied by unit price. The difference between total revenue and total cost gives the gross margin and a short run profit indicator. i.e.

$$GM = TR - TC \text{ ----- (1)}$$

GM=Gross Margin
TR=Total Revenue
TC = Total Cost

The estimated gross margin gives an indication of the profitability or otherwise of the individual sheep enterprise.

Returns per Naira invested in the enterprises was also used to indicate the profitability or otherwise of the individual sheep enterprises as return per Naira is equal to total revenue divided by total cost ie.

$$R/N = TR / TC \text{ --- (2)}$$

Where
R/N = Return per Naira invested
RT = Total revenue
TC = Total cost
Operating ratio is equal to total divided by total revenue
OR = TC / TR --- (3)

Where:
OR=Operating Ratio
TC=Total Cost
TR=Total Revenue

This indicates the percentage that goes to cover the expenses of the business which will indicate the profitability or otherwise

2.5.2 Regression Analysis

This is a process used to predict the effect of independent variables on dependent variables. it is expressed as follows.

$$Y = f (X_1 X_2 X_3 \text{ ----- } X_n) \text{ ----- (4)}$$

Which can be further explained as
Y = a₀/b₁ x₂/b₂x₃/b₃x₄/b_nx_n/U ----- (5)
Y = depended variable (Production)
X₁ to x_n = Independent variables
U = is the error term

a_0 = is the intercept
 $b_1 - b_5$ = slope

The data were subjected to multiple regression analysis. However, the explicit form of the model used in representing sheep production is given as follows:

$$Y = a_0 + b_1 x_2 + b_2 x_3 + b_3 x_4 + b_4 x_5 + b_5 x_6 + \dots \text{--- U}$$

- Where
- Y=Sheep Production
- a_0 =Intercept,
- $b_1 - b_5$ =Reg. Coefficient
- X_1 =Age
- X_2 =Household size
- X_3 =Education status
- X_4 =Feeding
- X_5 =Medication
- X_6 =Transportation

III. RESULTS AND DISCUSSION

3.1 Costs and Returns Analysis of Sheep Production

Analysis of costs and returns for sheep production shows that the total variable cost in the production process consist of acquisition cost per animal with the highest percentage of 87.06%, because the animal was the major item in the production.

The agrees with Adepoju and Omonona (2007) who stated that major item of production carries a high percentage of the variable cost. Cost of labour carries 8.61 percent which was the second variable that has a high percentage after cost of acquisition of the animal as the major variable cost.

This is similar to the findings of Adepoju and Omonona (2007). About 1.71% was the cost of feeding which is smaller than of labour because most of feed were quantified based on

opportunity cost. Cost of medication constituted 1.38 percent of the total variable cost, which indicates that sheep in the study area were not usually infected with serious diseases. The variable cost with least percentage was transportation cost; this is due to the fact almost all the production activities were carried out within a very short distance. This agrees with Alabi *et al* (2007). Who shows that transportation has least cost as a variable item?

The total variable cost was N870.710:00 (average value of N4, 087.82) which is less than the total revenue which was N3.581, 000.00 (average value of N16.812.20) and the gross margin was N2, 710.290.00 in total value and N12, 724.38 in average value, which shows that the enterprise was profitable. The return per Naira invested was 4.11 which imply that in every Naira invested in the production of sheep in the study are it will generate N3.11.

According to Erhabor and Olukosi (1988) operating ratio shows the proportion of the gross income that goes to pay for the operating cost and the operating cost is directly related to the variable input usage. And the operating ratio was 0.243 which indicates that the gross income will sufficiently cover the expenses on the variable inputs used and the business will expand and there will there be continuity.

3.2 Regression Analysis of Sheep Production

This analytical tool has been used to analyses sheep production in the study area.

Cobb – Douglass production function was used. This model has been used in order to measure the elasticity of production in response of output to change in the variable input, and Olukosi and Ogungbile (1989) state that classical production faction exhibits constant, decreasing and increasing marginal production while Cobb - Douglass function allows any of the three but not all the three. The result of the analysis is described in Table 2 below.

Table 1: Regression Analysis of Sheep Production.

Predictors	Reg. Coef.	St – dev	t - ratio
Constants	5.7949	0.7811	7.42
Age	-0.1729	0.2436	0.71 ns
Household size	-0.0814	0.2309	0.35*
Feeding	-0.0186	0.1410	0.13*
Medication	-0.0771	0.1395	0.55**
Transportation	-0.1156	0.1980	-0.58 ns
S = 0.0532	R-sq. = 67.2%	R – sq (adj) = 65.7%	

Source: Data Analysis, 2009.

**-Significant at $P \leq 0.05$

*-Significant at $P \leq 0.10$

ns-Not Significant

The independent variable considered were age, household size educational status, cost of feeding, cost of medication and cost of transportation in the model in which joint effect has influence on the dependent variable which is the production of sheep. This result of the analysis is given in table 2. The value of the coefficient of multiple determinations (R^2) is 67.2%. This percentage of the total variation in the dependent variable is explained by variation in the independent variable effect on the sheep production while the remaining 43.8 percent may be attributed to variation techniques. Household size is Significant ($P \leq 0.10$) and the regression coefficient is positive which implies that an increase in the household size lead to an increase in sheep production; so that the producers will earn more in order to cater for his/her family needs this has agreed with the findings of Sodiya (2009). Education status is significant ($P \leq 0.10$) which indicated that the higher educational level of a producer the more rational the individual will take decision in the production process which will in turns lead to high level of production. Therefore, education plays a significant role in overall process. This is similar to the finding of Onu (2009). Feeding is also significant ($P \leq 0.10$) which implies that feeding of an animal plays an important role in sheep production in which the animal will grow fat and will even attract higher price in the market which in turn will improve the financial status of the producers. Medication is significant ($P \leq 0.05$), this implies that good health of animal plays an important role in the production process and it is achieved through good medication. In this study the analysis shows that the producer, used to pay proper attention to the health of the animal, which in turn increase production with subsequent profit generation.

IV. CONCLUSIONS

In conclusion, the study has shown that sheep production is profitable. It can be seen that with policies on income generating activities of the farmers such as; the National

Fadama Development Programme and National Poverty Eradication Programme, sheep producers will benefit tremendously through these programmes for increase income, productively and welfare.

The following recommendations were offered:-

Modern production techniques should be provided to the sheep producers through the extension workers were by seminars and training programmes are to be organized for them private and public agencies should make credit facilities more available to sheep producers which will promote specialization and more marketable surplus.

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