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Analysis of Goat Rearing Among Inhabitants of Ajaokuta Local Government Area, Kogi State, Nigeria

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ABSTRACT

The study made an economic analysis of goat rearing among inhabitants of Ajaokuta Local Government Area of Kogi State. The study highlighted the socio economic characteristics of the respondent, described goat productivity indices, identified the reasons for rearing goat, determine the profitability of goat rearing as well as identified the determinant of the profitability of goat rearing in the study area. Structured questionnaire was used for data collection from 109respondents and analyzed with descriptive statistics, gross margin analysis and profit function. Findings showed that females (63.3%) dominated goats rearing in the study area. About 82.57% of the respondents are between 20-50 years with a mean age of 40 years and had a mean income of ₦121,605.50k per annum. All the respondent (100%) reared West African Dwarf goats. Extensive management system is mostly practiced by 63.6% of the respondent. The respondents practicing semi intensive management method (36.75%) fed their goats basically with cassava leaves and peels. Goat was reared in the study area mainly to make Profit (62.94%). The study further revealed that goat rearing is profitable with a Gross Margin estimate of ₦36,580.69 and a Benefit-Cost Ratio of 2.26:1. The cost of goat sold is the significant determinant of profitability in the study area. (P≤ 0.01). Goat rearing in the study area is on a small scale and requires less than ₦30,000 to start the business. The author therefore recommends that the inhabitants in the area who are interested in livestock production should consider goat rearing because of its cost-benefit ratio.

Key words: Goats rearing, profitability, productivity indices, gross margin, profit function

INTRODUCTION

Goats have been classified as medium sized herbivores and ruminants. According to Kosgey, 2004 they were probably among the first animals to be domesticated by man and were used as food. Today, there are some 200 different breeds of goats that produce a variety of products, including milk, meat, and fiber (mohair and cashmere). (Kosgey, 2004). Goats are also used in ceremonial feasting and payment of social dues (Okunlola, 2000). They adapt easily to various environments as evident from socio–economic perspective; they are sources of investment and as instrument against disaster. Small ruminants in general represent about 30% of the red meat and 21% of the total milk produced in sub Saharan Africa worth about 1.2 and 1.3 billion dollars respectively (Winrock International, 1992). Worldwide, goat meat production is higher than meat production from cattle or hogs (Kosgey, 2004). Goat is an integral part of a traditional crop livestock production, thus integrating livestock into a farming system to increase its economic, environmental, health and diversity, thereby making important contributions to the farm's sustainability (Vijaya, 2007)

According to Ojoye (2006), indigenous sheep and goat breeds constitute over 90 percent of the small ruminant population in Africa. Generally, small ruminants are highly adaptable to a broad range of environment; require less capital investment inbuilding houses and buying other materials required for their upkeep, space and maintenance (Iyiegbuniwe, 2003). The distribution of goats varied according to climate management systems and their susceptibility to disease in their environment (FAO 2003). There are different types of goats in Nigeria such as West African Dwarf, Red bororo, Pashmina shawls, Mohair and Kashmere (Porter, 2002).But the West African Dwarf (WAD) which is hardy and strong is common in Northern Nigeria. Indigenous goats have important socio-economic roles in the livelihood strategies of the poor farmers, especially those in rural and hard-to-reach areas. Those roles include their use as savings, insurance, security, accumulation and diversification of assets, social and cultural functions. They are also valued for their productive performance, adaptation to adverse climatic and geographical conditions where cattle and sheep can hardly survive (Abdel Aziz, 2010). Goats have

very few demands of housing and management. They hardly need separate housing and happily share their homes with their owners or his other livestock. Goats can be raised by landless agricultural labourers, ladies and children because they can thrive well on variety of leaves, shrubs, bushes, kitchen waste etc. Goat farming can be a profitable occupation for a farmer and can fit well into mixed farming. They are cheaper to maintain, easily available and have a friendly disposition and are capable of adapting to various agro-climatic conditions ranging from arid dry, cold arid to hot humid. They can be raised in plains, hilly tracts, sandy zones and at high altitudes and are more tolerant to hot climate than other farm animals. (Abdel Aziz, 2010). Being small-sized animals, they can easily be managed by women and children. Feeding, milking and care of goats do not require much equipment and hard work. Capital investment and feeding costs are also quite low. Despite the merits mentioned above, less is known on the profitability of goat production and factors affecting their profitability in the study area. The objective of the study therefore was to analyze the economics of goat rearing among inhabitants of Ajaokuta Local Government Area of Kogi State. Specifically, the study highlighted the socio economic characteristics of the respondents, described goat productivity indices, identified the reasons for rearing goats, determined the profitability of goat rearing as well as identified the determinants of the profitability of goat rearing in the study area.

METHODOLOGY

Study Area

The study was carried out in Ajaokuta Local Government Area of Kogi State. Ajaokuta is an Agrarian community located within the North Central of Kogi State area and lies between latitude of 7° $33^{1}22^{11}$N and longitude of 6° $39^{1}18^{11}$E of Nigeria. The dominant vegetation of Ajaokuta Local Government Area by virtue of lying on the fingers of the equator, is interspaced with erect and numerous trunks of trees. The 2006 projected population of the Local Government Area was put at 97,907.

Ajaokuta Local Government Area has three districts namely Ajaokuta, Eganyi and Ebiya. Ajaokuta district has it's headquarter at Ajaokuta native town. It has two distinct seasons; the rainy season starts from April to October, while the dry season starts from November and end in April. The inhabitants of the Local Government Area are basically farmers and grow crops like pumpkin, amarantus, tomato, cassava and also known for rearing of domestic animals such as chickens, goats and sheep.

Sampling Techniques

A multi stage sampling techniques was used for this study. The first stage involved random sampling of ten villages in the Local Government Area**,** and then a random selection of 12% of the population to acquire data from inhabitants in the sampled villages. Structured questionnaire was used to obtain required information from the respondents resident in the villages, thus 109 respondents were sampled for questionnaire administration.

Statistical Analysis

Descriptive statistical methods such as mean, frequency and percentages was used tohighlight the socioeconomic characteristics of the respondents, describe goat productivity indices, identify reasons for rearing goat and identify constraints of goat production in the study area. Gross margin analysis was used to determine the profitability of goat production.

GM = GI-TVC……. Eq.1
Where;
GM=Gross Margin
GI = Gross Income
TVC = Total Variable Cost
BCR=TR/TVC (BCR>1 IS PROFITABLE)
A profit function was developed within the frame work of the ordinary least square model and was used to identify the determinant of goat production in the study area. The model is expressed as:
$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7 U)$ ……Eq.2
Where;
Y= Profit from goat production (₦)
The explanatory /independent variables are:
X_1= Cost of goat sold (₦)
X_2= Cost of drugs and veterinary service (₦)
X_3= Mortality rate (number)
X_4= Birth rate (number)
X_5= Number of goat kept (number)
X_6= Cost of Foundation Stock
X_7= Other Costs (₦)
U = Error term

RESULTS AND DISCUSSION

The results presented on Table 1 revealed that most (63.3%) of the respondents were female while 36.7% were male. This is similar to the finding of Fakoya and Oloruntoba (2009) where female owned more small ruminants. Majority (82.57%) of the respondents were between 20-50 years with a mean age of 40 years. It thus showed that most of the goat farmers are still in their productive age thus the potential for increase in goat production in the study area.

Table 1: Socio Economic Characteristics of the Respondents in the Study Area

Variables	Frequency	Percentage (%)	Mean
Gender			
Female	69	63.3	
Male	40	36.7	
Age			
20-30	30	27.52	40
31-40	27	24.77	
41-50	33	30.28	
51-60	9	8.26	
61 and above	10	9.17	
Marital Status			
Single	20	18.3	
Married	85	78	
Divorced	4	3.7	
Household Size			
5-Jan	32	29.36	9
10-Jun	45	41.28	
15-Nov	18	16.51	
16 and above	14	12.84	
Educational level			
None formal Primary	16	14.7	
Secondary	16	14.7	
Tertiary	60	55	
	17	15.6	
Income level (₦)			
1,000 – 50, 000	21	19.27	₦121,605.50k
51,000 – 99,000	70	64.22	
100,000 – 150,000	10	9.17	
151,000 and above	8	7.34	
Occupation			
Civil servant	22	20.2	
Farmer	36	33	
Hair stylist	1	0.9	
Student	6	5.5	
Trader	44	40.4	

Majority (78.0%) of the respondents were married, 18.3% were single, and 3.7% were separated. About (41.28%) of the respondents had household size of between 6-10 persons, with a mean household size of 9 persons. The large family size implies that goat farmers would rely on family labour in the study area.

Table 2: Goat Productivity Indices in the Study Area

Variable	Frequency	Percentage (%)	Mean
Types of goat			
West Africa dwarf	109	100	
Management system			
Semi-intensive	40	36.7	
Extensive	69	63.3	
Number of goat kept			
1-30	70	64.2	13
31-60	30	27.5	
61 and above	8	7.3	
Type of feed given			
Cassava only	20	18.35	
Caloposium/centrol	13	11.93	
Gmelina/centrol	2	1.83	
Centrol leaves only	1	0.92	
Caloposium only	3	2.75	
Cassava leaves/peel	31	28.44	
Yam peel/cassava peel	1	0.92	
Cowpea only	5	4.59	
Gmelina leave	4	3.67	
Teak leave/cassava leave	5	4.59	
Teak leave only	1	0.92	
Birth rate			
1-2	99	90.83	2
3-4	10	9.17	
Types of disease			
Render pest	15	13.76	
Tuberculosis	20	18.35	
Mastitis	11	10.09	
Mosaic	2	1.83	
Poison	16	14.6	
Helminthiasis	17	15.59	
Foot and mouth	27	24.77	
Brucellosis	1	0.92	
Mortality rates			
1-2	44	40.37	
3-4	12	11.2	1
5-6	3	2.75	
Non	49	44.95	
Total	**109**	100	

Majority (70.06%) of the goat producers sampled were literate and this could have a positive effect on adoption of innovation (goat rearing) if introduced to them and thereby increase productivity.

Table 3: The Gross Margin analysis of goat rearing in the study area

Items	Average Variable Cost	% Average Cost
Variable cost (N)		
Cost of foundation stock	26,781.70	92.5
Cost of veterinary service	2,168.80	7.5
Total Variable Cost (TVC)	28,950.50	100
Return/Revenue		
Wean Kid	18,741.28	28.6
Cull Doe	7,161.47	10.9
Doe	17,267.89	26
Matured Ewe	22,360.55	34.1
Total revenue (GI)	65,531.19	100
GM (GI-TVC)	36,580.69	
BCR = TR/TVC	2.26:1	

Egun (2009) observed that years of formal education has a positive influence on adoption of innovation. About (74%) of the respondents had income of been ₦51, 000, - ₦150, 000 with a mean income of ₦121,605.50k per annum. This level of income has the capacity to improve living standard of the goat farmers in the study area. About (40.4%) of the respondents were traders, 33.0% were into farming, 20.22% are civil servant, and 5.5% were student. These results showed that goat rearing is not limited to farmers alone. People in all works of life are also involved.

Goat Productivity Indices in the Study Area

The result of goat productivity indices is presented in Table 2. The study shows that all the respondents reared West African Dwarf goat. This is probably because West African Dwarf goats adapts well to the climatic condition and are not susceptible to diseases in the study area. Tekelye *et al.*(2003) expressed that goat production is positively associated with agro-ecologies. Falusi and Adeleye (2008) stated that West Africa Dwarf goats are the predominant breed of goats in the humid forest zone of Nigeria. More than half (63.3%) of the respondents practiced extensive system of goat management, implying that goat feed in the form of forages are readily available in the study area. Most (64%) of the respondent had goat flock size of between 1-30, with a mean goat farm size of 13 indicating that goat rearing is done on a small scale by the respondents.

The respondents practicing semi intensive system of management (36.75%) fed their goats basically with cassava leaves and peels. This could imply that cassava leaves and peels were readily available in the study area. Majority of the respondents (90.86%) had between 1 – 2 births per doe, with a mean birth rate of 2 kids. Further analysis showed that goats reared are infested by diseases ranging from rinderpest to brucellosis. However, high rate of infestation was not recorded. About (24.77%) of the goat had foot and mouth diseases while (18.35%) had tuberculosis. Result on mortality rate shows that about (40.37%) of respondents recorded between 1-2 deaths with a mean mortality rate of 1 goat.

Table 4: Regression analysis of the profitability of goat production in the study area

Variable	R/ Coefficient	Standard error	t-value	Sig.
Cost of goat sold	0.69	0.244	2.824	0.0057***
Cost of drug and veterinary	-3.425	5.594	-0.612	0.452NS
Mortality rate	-2151.179	5987.746	-0.359	0.7201NS
Birth rate	-3761.169	3650.232	-1.03	0.305NS
Number of goat kept	4033.093	2672.58	1.509	0.134NS
Cost of foundation	-0.801	0.813	-0.985	0.327NS

R2 = 0.167 = 16.7%, *** = Significant at 1%, ** = Significant at 5%, *= Significant at 10%
NS = Not significant

Table 5: Reasons for rearing goats in the study area

Variables	Frequency	Percentage (%)*
Profit	107	98.16
Consumption48	44.03	
Traditional purpose	15	13.76

*multiple response

Gross Margin Analysis

To determine the profitability of goat production the cost incurred in the various inputs used and the revenue generated from the sales of goat were estimated based on the prevailing market price as at the period of survey. The average cost of foundation stock used by the farmers in the study area is ₦26,781.74k and recorded the highest percentage (92.5%) of the total variable cost. The mean cost incurred on veterinary service was ₦2,168.81/farmer. This constitutes the least percentage (7.5%) of the total variable cost. Other costs such as labour and feed were

negligible as all the farmers used family labour and extensive / semi intensive system of management and therefore incurred no cost on labour and feed.

The average revenue obtained from sales of the different categories of goats reared was ₦ 65,531.19. weaned kids constituted about (28.6%), Doe constituted (26%) and matured ewes constituted (34.1%) of the total revenue obtained from sales of goat respectively. Gross margin estimated in the study area was ₦36,580.69/farmer on the average. The benefit cost ratio (BCR) was 2.26:1 thus signifying goat rearing has a high profit margin in the study area.

Determinants of profitability of Goat Production in the Study Area

As shown on table 4 the ordinary least square regression analysis on the determinants of the profitability of goat revealed that R^2 value of 16.7% was recorded, this implied that 16.7% of the variation in the independent variable is explained by the model. Cost of goat sold has positive coefficient and significance at 1% level indicating that increase in the cost of goat sold would increase the profitability of goat production in the study area. Only the cost of goat sold significantly affected profitability in the study area. This in effect explains why the $R^2$was very low.

Majority of the respondents reared goat for profit making (62.94%) while 28.24% reared goats for consumption with 8.82% rearing goat for traditional purposes. This is in line with the finding of Amerin-Boyes (2009), who observed that goats are reared mostly for money making, cultural roles and consumption.

CONCLUSION

The findings from this study revealed that women dominated the rearing of West African dwarf goat in Ajaokuta Local Government Area. West African Dwarf Goats were the only breed found in the study area. Goat is reared on a small scale and mostly for economic reasons in the study area. Rearing goats is highly profitable in the study area and require less than ₦30,000 only to venture into the business. Considering the fact that cost of goats sold was found to significantly determine the profitability level in the study area, goat rearing should be intensified so as to improve on the scale of production to take advantage of the economics of scale, increasing turn over in sales and at the same time reducing the cost of goat sold in the study area. Inhabitants should be encouraged to eat chevon this would lead to increase demand and by extension increase in profitability level of the respondents. They should also be encouraged to venture into intensive goat rearing.

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