

AN ANALYSIS OF KEY DETERMINANTS IN SMALL-SCALE GOAT FARMING IN BENUE STATE, NIGERIA

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Abstract

Livestock farming is of economic importance to livelihoods of many communities in Benue State, Nigeria. Unfortunately, very few farmers participate in goat production. This study was carried out to establish the factors influencing small-scale goat production in Benue State, Nigeria. A household survey using a structured questionnaire was administered in November, 2023. The spearman correlation coefficient was used to test the association between number of goats against farm size, gender age, marital status, education, household size, formal training, diseases, income and extension services. Out of the 250 respondents surveyed, 72.0% were males and more than half (54.0%) of the farmers attended primary school, followed by secondary education (30.0%). Most of the farmers (72.0%) had a herd size of less than 20. The main source of income in the study area was selling of crop produce. The majority (78.0%) of the farmers indicated that they planned to increase their goat herd. Goat production in Benue State, Nigeria is constrained by diseases, feed, water, theft, veterinary services, insufficient funds, lack of extension services, lack of exotic breeds in remote rural areas. The study revealed that farm size, age of the farmer, education and extension visits were associated with herd size. Age, extension visits and education were significant at 5% while farm size was significant at 1%. The results and findings of this study are capable of giving an insight to the government, policy makers and nongovernmental organizations that focus on improving livestock production in rural areas.

Keywords: Goat Production, Herd size, Small-scale, Benue state, Livelihoods.

INTRODUCTION

Goats (*Capra hircus*) belong to the group of animals known as capra. They are ruminant animals like cattle and sheep. Goats are found in towns and villages all over Nigeria (Adefemi, 2014). There are more than three hundred breeds of goat. Goats are one of the oldest domesticated species. They were the first animals to be domesticated by humans around 9000 years ago (Kajevhu and Mabika, 2023). Goats produce a variety of products such as milk, meat, hair and skin (Adefemi, 2014). Worldwide, the production of goat meat is greater than the production of beef or pork (Kajevhu and Mabika, 2023). Goats are kept traditionally by a large part of the population in the rural areas of Nigeria. Goats play important roles within the households of subsistence farming system in these rural areas. They are used to maintain social bonds with the community, they are used for ceremonial or religious purposes (Kumar, 2007). They provide income as well as meat and milk for households (Adefemi, 2014). In Southern Africa, large amount of public and private funds have been invested in goats. The goal is to increase the number of goats and increase their productivity (Kajevhu and Mabika, 2023).

Improving goat production has been an on-going challenge at both academic, institutional, village and individual farmer levels, and a major pathway is through breeding (Ndlovu, Mayimele, Wutete and Ndudzo, 2020). Benefits

from genetic improvement that add value to goat meat endproducts could achieve sustainable development and reach a wider population of the poor and the needy (Shrestha and Fahmy, 2005).

In Nigeria, it has been reflected time and again that livestock is an important and integral component of agriculture, which is the mainstay of the economy. Apart from the sub-sector providing the much needed animal protein for the ever-growing population, it offers employment opportunities for millions of rural and urban dwellers involved in livestock production and marketing (Adefemi, 2014). Despite the large size of the country's goat enterprise, the productivity per unit of animal and the contribution of this sector to the national economy is relatively low (Adefemi, 2014). This may be due to a number of factors such as poor nutrition, lack of appropriate breed, prevalence of diseases, lack of appropriate breeding strategies and poor understanding of the production system as a whole.

Goats rearing and trading is prevalent in almost every part of Nigeria because they are cheaper to rear than other ruminants (cattle and sheep) since they require less space and shelter, and smaller quantities of food and equipment. This fits in very well with the conditions in the rural communities. Goats are of value in removing browse and shrubs which infest farmlands in grassland areas (Mamabalo and Webb, 2005).

Goats contribute significantly to the livelihoods of smallholder farmers in Nigeria. Over 95% of the 10.5 million goats in Nigeria are found in the smallholder farming sector (Adefemi, 2014). Most of the smallholder farmers live in different agro-ecological regions which are characterized by poor rainfall, and permits low cropping activities (Kajevhu and Mabika, 2023).

Nigeria's livestock (particularly goats) production dropped significantly because of export problems caused by meat export safety regulations (Adefemi, 2014). This led to a shortage of goat by products such as goat meat, goat skin and goat milk in the market. The shortage of goat meat and their by-products have necessitated an increase in their price which is beyond the reach of the majority of the Nigerians who also suffering from malnutrition, reduced household income and food insecurity (Nyiatagher, Umeh and Ocholi, 2015). Furthermore, village goats have generally been neglected by researchers, veterinarians and even extension workers. Therefore, it has become imperative to assess the factors that are influencing small-scale goat production in Benue State, Nigeria. The results and findings of the study could proffer solutions to the problem of low goat yields for small and large scale farmers so as to increase the level of family income and guarantee food security in Benue state and Nigeria at large.

METHODOLOGY

The Study Area

This study was carried out in Benue state, Nigeria. Benue State is a State in the North Central part of Nigeria. The State is bounded by Nasarawa State to the North, Taraba State to the East, Cross River State to the South-East, Enugu State to the South-West, and Kogi State to the West. The southern part of the State also shares boundary

with the Republic of Cameroon. The State is also bordered by 280km River Benue and is traversed by 202km of River Katsina-Ala in the inland areas. Benue State derived its name from River Benue, the second largest river in Nigeria. The State was created in 1976. Benue State is located approximately between latitudes $6\frac{1}{2}^0$ and $8\frac{1}{2}^0$ North and longitudes $7\frac{1}{2}^0$ and 10^0 East (Nwalem, Ukpe, Djomo and Dzever,

2016). Benue State has a tropical climate which manifests two distinct seasons. The rainy season is from April to October while the dry season is from November to March. Annual average rainfall varies from 1750mm in the southern part of the state to 1250mm in the North.

Benue State has a total land area of about 30955km² and administratively it is divided into 23 local government areas (LGAs) and three agricultural zones (A, B, and C). It has an estimated population of 5742815 inhabitants in 2016 (Abah, 2020). The majority of the inhabitants are members of Tiv, Idoma and Igede ethnic groups. Production of cattle, goat, sheep, pig and poultry are commonly practiced. The agricultural production system in the study area is mixed cropping. Crop production is the main agricultural activity for the livelihood of the smallholder farmers in the study area. Benue State was chosen for this study because livestock enterprise is an integral part of the land use system.

Sampling and Sample Size

The study population comprised household heads who were into goat production (farming). The list of registered goat farmers was collected from goat farmers' association secretariat of each of the six local government areas. These local government areas included: Kwande, Vandeikya (from zone A), Gboko, Makurdi (from zone B) and Otukpo and Oju (from zone C). Random sampling technique was employed to select 20% of goat farmers from the list supplied by each local government area, making a total number of 250 respondents for this study. Primary data were collected with use of structured questionnaire. The farmers were grouped into three strata based on the number of goats: less than 20 goats, 20-40 goats and above 40 goats.

Data Analysis

The data collected were subjected to descriptive statistics presented in the form of tables. The spearman correlation coefficients were used to analyse (test) the association between number of goats against gender, marital status, farm size, age, household size, level of education, income, formal training, extension services and diseases.

RESULTS AND DISCUSSION Demographic Characteristics of the Respondents

Two hundred and fifty respondents took part in the survey and majority (72.0%) of the respondents were males (Table 1). This observation agrees with a study in Mushowani, Zimbabwe, where 59.6% of the goat farmers were male (Kajevhu and Mabika, 2023).

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The majority (68.0%) of the goat farmers were married, while 20.0%, 8.0% and 4.0% were single widowed and divorced respectively. This indicates that the larger percentage of goat farmers are married. As a result, family labour is likely to be available for goat farming activities (Nyiatagher and Ocholi, 2015).

More than half (54.0%) of the farmers attended primary school, followed by secondary school (30.0%). A small proportion (12.0%) attended tertiary education while 4.0% never attended school. This revealed that a large percentage of the respondents are literate and this could enhance their production management skill. Majority (64.0%) of the households' sizes were in the 6-10 range, while 14.0% household had family members greater than 10.

The result indicates that household size is large, implying that in the presence of constraints to farm labour availability, large households tend to use family members as source of labour. Large households, whose labour is fully employed for agricultural production, would contribute to labour input for increase and sustainable production (Adefemi, 2014).

Farming was the major (66.0%) occupation and 24.0% of the farmers were employed while 6.0% of the respondents were not employed. The main source of income was selling crop produce (74.0%) followed by small business (20.0%) and mining (6.0%).

The economic status of this state (Benue) is best illustrated by the fact that most of those interviewed indicated their main source of household income was mainly from selling crop produce followed by small businesses and mining. This finding agrees with a study in Mushowani, Zimbabwe where most of the respondents indicated that their main source of household income was mainly from selling of crop produce (Kajevhu and Mabika, 2023).

From table 1, it is clear that very few young farmers (16.0%) are into goat farming. This can be attributed to mining activities in the study area where most of the youth prefer. It can also be attributed to the fact that the younger household heads are more likely to offer their labour and take part-time jobs in the neighbouring towns of Lafia, Jalingo, Enugu, Obudu and Lokoja than to be engaged in goat farming (Nyiatagher, Abiyong and Aniah, 2019).

Table 1: Demographic Characteristics of the Respondents.

Variable	Frequency	Percentage (n=250)
Household head (sex)	-	-
Male	180	72.0
Female	70	28.0

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Marital Status	-	-
Married	170	68.0
Single	50	20.0
Widowed	20	8.0
Divorced	10	4.0
Educational Level	-	- 4.0
Never attended school	10	54.0
Primary education	135	30.0
Secondary education	75	12.0
Tertiary education	30	
Household Size	-	-
1-5	55	22.0
6-10	160	64.0
>10	35	14.0
Major Occupation	-	-
Farming	165	66.0
Employed	60	24.0
Self-employed	10	4.0
Not employed	15	6.0
Source of Income	-	-
Selling crop produce	185	74.0
Small Businesses	50	20.0
Mining	15	6.0
Age (Years)	-	- 6.0
< 20	15	16.0
21-30	40	12.0
31-40	30	36.0
41-50	90	30.0
> 50	75	

Source: Field Survey, 2023

Stock profile of goat farmers in the study area

Three types of goat breeds were recorded: the West African dwarf (58.0%), the Red Sokoto breed (32.0%) and the Sahel breed (10.0%). The majority (64.0%) of the parent stocks were between 13-18 months followed by the stock 9-12 months (20.0%). The stock less than 9 months was 12.0% while parental stock greater than 18 months were the least preferred stock (4.0%).

Most goat farmers (56.0%) acquired their breeding stock from the family and relatives, 14.0% acquired from friends and neighbours, (10.0%) acquired their breeding stock from small traders while 10.0% acquired their breeding from research extension, government and nongovernmental organizations.

Three breeds were found: the West African dwarf, the Red Sokoto and Sahel breed. Unavailability of feeds, drugs as well as poor management system are some of the factors which result in most farmers keeping West African dwarf breeds since their management system is not much complicated (Kajevhu and Mabika, 2023). Of interest was that most (56.0%) goat farmers acquired their breeding stock from the family and relatives. It is therefore of concern as to why the majority of the farmers did not acquire their breeding stock from research extension, stock merchants, government and non-governmental organizations as these are presumed to offer quality breeds. A follow-up research is recommended as to establish why farmers are not acquiring their stock from these reputable sources. Despite the hardiness of West African dwarf breed, their mortalities are very high in communal areas (Adefemi, 2014). Lack of proper health care, infections, disease and nutritional inadequacies can also result in high mortalities (Kajevhu and Mabika, 2023).

Table 2: Stock Profile of Goat Farmers in the Study Area.

Variable	Frequency	Percentage (n=250)
Parent stock breed	-	-
West African dwarf	145	58.0
Red Sokoto	80	32.0
Sahel breed	25	10
Age of parent stock (months)	-	-
< 9	30	12.0
9-12	50	20.0
13-18	160	64.0
> 18	10	4.0

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Source of breeding stock	-	-
Family and relatives	140	56.0
Friends and neighbours	35	14.0
Small traders	25	10.0
Large traders	10	4.0
Store merchant	15	6.0
Cooperatives	-	- 4.0
Research Extension	10	
Non-governmental organization	10	4.0
Government	5	2.0

Source: Field survey, 2023

Goat production in the study Area

Most (72.0%) of the goat farmers had goat herds of less than 20 while 24.0% of the farmers had goat herds in the 21-40 range (Table3). Very few farmers (4.0%) had goat herd's size of more than 40. The majority of the farmers (62.0%) kept goats for income purposes, 24.0% kept goat for family consumption, while 10.0% kept goats for security, the remaining 4.0% kept goats for prestigious reasons. Sixty-two percent of the farmers indicated that goat diseases were prevalent in the area. Most (80.0%) of the goat farmers agreed that there were extension visits in the area by extension officers and the majority of the goat farmers (78.0%) indicated that they planned to increase their herd. Most (68.0%) farmers practiced partial confinement management system and 32.0% practiced free range management.

The herd size of the majority (72.0%) of the goat farmers was less than 20. These goats were raised under partial confinement. Though most farmers agreed that they were supported by extension officers in their goat farming business, it is still worrisome why most of them have small herd sizes. However, one of the reasons noted was that some the areas were not easily accessible during rainy season. This finding agrees with a study in Mushowani, Zimbabwe where most (69.2%) of goat farmers had herd size of the less than 20 and despite they agreed that they were supported by extension officers, most of them had small herd sizes (Kajevhu and Mabika, 2023).

Table 3: Goat Production in the Study Area.

Variable	Frequency	Percentage (n=250)
Number of goat units	-	-
< 20	180	72.0
20-40	60	24.0
> 40	10	4.0

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Purpose for keeping goats	-	-
Source of income	155	62.0
Family consumption	60	24.0
Security	25	10.0
Prestigious purpose	10	4.0
Disease prevalence	-	-
Yes	155	62.0
No	70	28.0
Not sure	25	10.0
Extension visits	-	-
Yes	200	80.0
No	30	12.0
Not sure	20	8.0
Plan to increase the herd size	-	-
Yes	195	78.0
No	40	16.0
Not sure	15	6.0
Management system	-	-
Free range	80	32.0
Partial confinement	170	68.0
Permanent confinement	0	0.0

Source: Field survey, 2023

Constraints faced by goat farmers in the study area

In Table four several factors were identified as the constraints faced by goat farmers in the study area. These were feed (56.0%), diseases, (56.0%), water (52.0%), theft (52.0%), veterinary services (50.0%), insufficient funds (48.0%), lack of exotic breeds in remote rural areas (46.0%), heat stress (44.0%), transport (40.0%) market (36.0%) and lack of extension services (30.0%).\

According to Table 4, feed, diseases, water, theft and veterinary services were the major constraints affecting goat farmers in Benue state, Nigeria. This was followed by insufficient funds, lack of exotic breeds in remote rural areas, heat stress and transport. Market and lack of extension services were identified as minor challenges affecting goat farmers.

The problem of disease as observed in this study also confirms the finding elsewhere where it was reported that animal diseases constitutes a major constraint in livestock production and safe utilization of animal products worldwide (Abiyong, Bidoli and Nyiatagher, 2019). For small scale farmers, the impact of livestock disease on lives and livelihoods is particularly severe. An outbreak of disease can mean the difference between sufficient food stocks, and food insecurity and between having a secure income to the loss key households assets (Nyiatagher, Umeh and Ocholi, 2015). The presence of diseases also makes it so difficult for the poor to participate in local and even the national livestock economy (Musa, Iheanacho and Nyiatagher, 2018).

Lack of exotic breeds was also another constraint identified by the goat farmers. This evident from the results as the majority of the breeds were indigenous West African dwarf breed. It is therefore, important to assist farmers in acquiring exotic breeds in order to improve their goat farming enterprise.

Table 4: Constraints faced by goat farmers in the study area (n = 250)

Variable	Frequency	Percentage*
Constraints	-	-
Feed	140	56.0
Diseases	140	56.0
Water	130	52.0
Theft	130	52.0
Veterinary services	125	50.0
Insufficient funds	120	48.0
Lack of exotic breeds	115	46.0
Heat stress	110	44.0
Transport	100	40.0
Market	90	36.0
Lack of extension services	75	30.0

Source: Field survey, 2023 * Multiple responses existed, hence percentage >100

Factors Affecting Goat Production in the Study Area

Four variables were found to have a significant effect on goat production in the study area (Table 5). These four factors were: education, age, extension visits and farm size. Education, age of the farmer and extension visits were significant at 5% while farm size was significant at 1% (Table 5).

The results of the study indicated that the major factors affecting goat production in Benue state, Nigeria were farm size, education, age of the farmer and extension visits. Despite the fact farm size had a weaker negative correlation, it is well established that as the size of the farm increases the goat herd size also grows and vice versa.

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(Feder, 1985). Currently, most large-scale farmers do not take goat farming business serious that is why goat farming is most common in smallholder farmers. The results also showed that age has a bearing on goat production in Benue state, Nigeria.

This observation was also reported by Kajevhu and Mabika (2023) in Zimbabwe. Household head age tends to be of importance in agricultural productivity as indicated by the level of experience that a person attains as they grow old in their day to day rearing of goats (Nampanzira, Kabasa, Nalike, Nakalembe and Tabuti, 2015; Nyiatagher and Ocholi, 2015).

The study also noted that only 16.0% of the youths (21-30 years) were into goat farming. This possibly implies that the enterprise is missing out on a more active group, who would enhance productivity and commercialization (Nampanzira *et al.*, 2015).

More than half (54.0%) of goat farmers had received schooling up to primary level and farming was their major occupation. This level of literacy is strength in enhancing goat production because literate communities are more likely to adopt and practice new technologies which may enhance commercialization of enterprises (Kajevhu and Mabika, 2023).

Extension services were also considered as factors affecting goat production in Benue state, Nigeria. This observation confirms to similar studies in Ethiopia and Zimbabwe (Nyamangara, 2001; Kajevhu and Mabika, 2023). One of the reasons identified in this study was that the frequency of visits by extension services officers from Ministry of Agriculture is quite poor. During the rainy season, goats are affected by a number of diseases and the unavailability of extension officers during that time greatly affects goat production (Ndlovu, Mayimele, Wutete and Ndudzo, 2020). Furthermore, extension services also play an important role in improving the information flow from farmers to scientists.

Table 5: Factors affecting goat production (spearman correlation results)

Variable	Significance (2-tailed)	Correlation coefficient
Age	0.043	0.085*
Farm size	0.003	-0.247**
Marital status	0.649	0.531
Gender	0.170	0.366
Diseases	0.081	-0.046
Education	0.021	0.134*
Income	0.840	0.063
Household size	0.462	-0.126
Extension visits	0.042	0.145*

Formal training	0.549	-0.367
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Source: Field Survey, 2023

Conclusion and Recommendation

Goat production provides economic benefits which are capable of improving the livelihoods of communities. Regular cash income from selling goats and family consumption were the most important reasons for keeping goats. This study found that farm size, education, age of the farmer and extension visits were the major factors affecting goat production in Benue state, Nigeria. It is therefore important for all stakeholders in goat business to work together so as to mitigate against the aforementioned constraints so as to improved goat production business in Benue state, Nigeria.

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