



## **Fatteners' Preferences for Breed of Sheep Attributes under Feedlot System in Kano Metropolis, Nigeria**

**<sup>1</sup>Tafida, I., <sup>2</sup>Lawal, A. T. and <sup>1</sup>Ahmed, I. A.**

**<sup>1</sup>Department of Agricultural Economics and Extension, Bayero University, Kano.**

**<sup>2</sup>Department of Agricultural Economics and Extension, Kano University of Science and Technology, Wudil**

### **ABSTRACT**

*The study analysed smallholder fatteners' preference for breed of sheep attributes under feedlot system in Kano Metropolis, Nigeria. A Snowball sampling technique was used to select 70 sheep fatteners. Five locations were purposively selected due to high concentration of sheep fatteners operators. Primary data was collected through the use of structured questionnaire and was subjected to descriptive statistics. The results revealed that all (100%) of the fatteners were male and most (84.3%) of the fatteners were married. The average age and years of fattening experience of the respondents were 46 and 26 years respectively, with average household size of 10 persons and a mean flock size of 8. Majority (61.4%) of the sheep fatteners received western education and 85.7% of the sheep fatteners belonged to farmer cooperatives. The management practices carried out by the sheep fatteners were feeding, watering, housing, animal health treatment and fattening duration. Also, the result shows that almost all (95.9%) of the sheep fatteners preferred the Uda and Balami breeds of sheep to any other breed because of the Carcass quality, body size, skin type/colour, horn type, tail type and type of ear. The study concluded that Uda and Balami were the most preferred breeds by fatteners in the study area. High cost of feed (100%) ranked as first constraint followed by pest and disease problems and insecurity with 94.3% each and high cost of medication (93%). The study recommends that provision of adequate and affordable feed and medication, veterinary services to carter for pest and diseases and improvement in security are essential in improving sheep fattening enterprise.*

**Key words:** Small ruminants, Management, Uda and Balami, Snowball, Fattening

**Corresponding Author Email:** [itafida.ext@buk.edu.ng](mailto:itafida.ext@buk.edu.ng), **Phone No.08035868653**

### **INTRODUCTION**

Small ruminants play an important role in the food and nutritional security of millions of rural people especially the landless, marginal and small-scale farmers in Nigeria. Nigeria is endowed with an estimated 19.5 million cattle, 72.5 million goats, 41.3 million sheep, 7.1 million pigs and 278,840 camels, 145 million chickens, 11.6 million ducks, 2.1 million turkeys and 974, 499 donkeys making Nigeria the topmost livestock producer in West Africa (FMARD, 2016). Despite

this huge and robust population of Nigeria livestock enterprise, majority of livestock in Nigeria are kept by subsistence farmers. Unfortunately, under traditional management system the animal depends mostly on household waste and bush grazing which do not provide adequate level of nutrition for optimum production and performance (Zalkuwi *et al.* 2014). In Nigeria, small ruminants contribute an estimated 35% to the total meat supply; they are more important in the North than in the South, and more important in rural than in urban areas (Kalu & Ekwe, 2020). Small ruminants are kept by smallholder farmers for meat, hides, wool and, to a lesser extent, milk. The socio-economic value of small ruminant rearing as compared to other livestock species, for poor farmers is immense. (Shiv Prasad, 2013).

In Nigeria, Sheep play a significant socio-economic role in the life of the people, they are slaughtered during ceremonies and festivals, and serve as a source of ready cash to small-scale farmers. Apart from the fact that sheep fattening is employing smallholder farmers, women cooperative societies, especially in Africa and beyond. Poor families are keeping one or two sheep for fattening, while big players are coming in to buy sheep from the local communities in large quantities to fatten them and sell them in urban areas and other countries, thereby creating employment for the local population and also improving the rural economy. Among the various livestock production activities in most parts of the world especially in developing countries, sheep fattening activity is gaining grounds and is fast becoming one of the most viable potential sources of employment opportunity and a source of livelihood for many families. Sheep fattening is also used as a very good tool in increasing the value and quality of meat produced in any given society (Bako, 2019).

Despite of all these contributions, the livestock sub-sector is a relatively neglected part of agriculture with its supporting services collapsing well ahead of others (Oni, 2006). The Food and Agricultural Organization (FAO) recommends that the minimum intake of protein by an average person should be 65g per day; of this about 40 per cent, that is 27g should come from animal sources. Nigeria is presently unable to meet this requirement. The animal protein consumption in Nigeria is less than 8gram per person per day, which is far below FAO minimum recommendation (Niang & Jubrin, 2001). Globally, Nigeria is among the least consumers of animal protein, for instance North America, West and Eastern Europe countries consume 66, 39 and 33g per head per day, respectively. The average for Nigeria is 7.5g per head per day, which is below the recommended level of about 27g per head per day by Food and Agriculture Organization (Niang

& Jubrin, 2001). The total recommended protein intake for growth and development in man is 85.9g per caput per day and 39g should be from animal origin (Adegun & Fajemilehin, 2018). According to FAO (2005), an average Nigerian consumed only about 33g of protein caput per day. This is 52.9g below the recommended level. The gap between actual and expected protein intake among Nigerians continues to widen (National Bureau of Statistics [NBS] and Federal Ministry of Agriculture and Rural Development [FMARD] 2011 and FMARD, 2016). As a result of the above, widespread hunger and malnutrition are evident in the country. Sheep fattening techniques is a tool that can be used in alleviating poverty in countries around the world. Most especially in developing countries as mentioned earlier. Sheep are kept predominantly by Fulani pastoralists, who manage them fairly extensively. In Kano Metropolis, livestock fattening practices by farmers are mostly by feedlot system. But, it has not received much attention it deserved in term of extension service delivery to fatteners.

However, to bridge the demand-supply gap of animal protein in terms of meat in Nigeria, there is need to adopt other sustainable means of production. Thus, livestock fattening appears to be an alternative to meeting the increasing demand for meat in the nation (Oni, 2006). This study is aimed at analysing the socio-economic characteristics of the sheep fatteners, describe the management practices of sheep fattening, analyse fatteners' preferences on the selected breeds of sheep, and describe the constraints to sheep fattening in the study area.

## **METHODOLOGY**

### **The Study Area**

The study was conducted in Kano Metropolis, Kano State, Nigeria. It shares boundary with Jigawa, Katsina and Kaduna State. Kano State has a total of 44 Local Government Areas and a population of more than nine million people with 4,947, 952 males and 4,453,336 females (NPC, 2006) with a growth rate of 2.9% per annum (Kano State Government [KNSG], 2020). The projected population of the State stand at 14,661,082 by 2020. The maximum temperature ranges between 21°C – 42°C with annual rainfall ranges between 787mm and 960mm (Kano State Agricultural and Rural Development Authority [KNARDA], 2007). The State has a total land area of 20,760 square kilometres. It is situated in Sudan savannah zone within latitude of 13<sup>0</sup> 53'N and 10<sup>0</sup> 25'N, and longitude of 7<sup>0</sup> 40'E and 10<sup>0</sup>53'E. farming and trade are the main occupation of these people, who are predominantly Hausa – Fulani engaged in the production of crops like millet, sorghum, maize, cowpea, groundnut, pepper, onion and rearing animals like cattle, sheep, goat, poultry, etc.

The promotion of agriculture in Kano State is carried out by a number of governmental and non – governmental organizations. Kano State Rural Agricultural Development Authority (KNARDA) is the technical and management unit responsible for agricultural extension in the State and divided into three administrative zones which are called zone 1, zone 2, and zone 3 by the ADP.

### Sampling Techniques

Non-probability sampling comprising of purposive and snowball sampling techniques were used for the study. Five prominent areas in Kano Metropolis were purposively selected because of the concentration of sheep fatteners in the area. They include; Goron dutse, Kofar ruwa, Gandun albasa, Kofar kudu and Abattoir. Snowball sampling was finally used to select the individual sheep fatteners in the selected areas. A Sample size of 70 (10%) from a sampling frame of 700 sheep fatteners was used as it was considered to be large enough to provide information since they are all small-scale fattening operators. The breakdown of the sampling frame and sample size is shown in Table 1.

**Table 1: Sample frame and sample size of sheep fattening operators**

S/N	Areas	Sampling frame	Sample size at 10%
1	Goron dutse	150	15
2	Kofar ruwa	207	21
3	Gandun albasa	90	09
4	Kofar kudu	110	11
5	Abattoir	143	14
	Total	700	70

Source: Field survey, 2021

### Data Collection Procedure

Primary data was used as a source of information in the study. The data was collected through face to face interview using structured interview schedule administered with the assistance of trained enumerators. The information collected include among others socio-economic attributes of the sampled fatteners, management practices used in sheep fattening, fattener’s breeds preferences and constraints to sheep fattening.

### Analytical Techniques

The data collected were analysed using descriptive statistics of frequency count, percentage and mean.

## **RESULTS AND DISCUSSION**

### **Socio-economic Characteristics of Sheep Fatteners**

Table 2 revealed information on socio-economic characteristics of the sheep fatteners and the results shows that age of the sheep fatteners range between 23 to 75 years, with an average age of 46 years. This implies that most sheep fatteners were within the age range of been economically active and productive. This is in line with the findings by Shettima, Mohammed, Lawan, and Ghide (2019) who reported that most of the fatteners were young people actively engaged in sheep fattening enterprise in Adamawa State, Nigeria.

The minimum, maximum and mean household in Table 2 was 1, 28, and 10 respectively. It implies that the relatively large family size may mean more people to work in fattening activities. It is not surprising because household with large family sizes have more mouth to feed.were likely to provide family labour for fattening activities. This is not in agreement with the findings on Socio-economic Factors Influencing Livestock Production among Smallholder Farmers in the Free State Province of South Africa of Nkonki-Mandleni, Ogunkoya and Omotayo (2019) and on Demographic and Socio-economic Characteristics of Livestock Rearers in Maiduguri Metropolis, Borno State, Nigeria of Mukhtar, Iliya, Dankani and on Yakubu (2019) who reported that majority of their respondents had 5 and 1 to 7 persons per household respectively.

The results of fattening experience in Table 2 also revealed that fatteners had accumulated reasonable skills and knowledge in sheep fattening. The minimum, maximum and mean years of fattening experience were 3, 55 and 26 respectively. Long term experience is important as the fatteners' management skills increase with increasing years of fattening experience.

**Table 2: Summary of Socio-economic Characteristics of the Sheep Fatteners (n=70)**

Variables	Minimum	Maximum	Mean	Std.
Age (years)	23	75	45.8	12.9
Household size (Number)	1	28	9.5	6.4
Fattening experience (years)	3	55	26.2	11.4
Flock size (number)	2	20	8.4	5.2

Source: Field Survey, 2021

The minimum, maximum and mean flock size for sheep fattening in Table2 were 2, 20 and 8 respectively. This result implies that sheep fattening was dominated by smallholder fatteners in the study area. This is in agreement with Hassan, Mbap and Naibi, (2015) who reported that majority of their respondents kept between 11 to 20 Yankasa sheep.

Table 3 shows that all the fatteners were Male. The participation of females in sheep fattening is less and dominated by males. This is because of culture, custom, religion and individual perspective. This is in agreement with Nkonki-Mandleni, Ogunkoya and Omotayo (2019) who reported in their study area that most of cattle and sheep farmers were males. Females are expected to cook and conduct house chores while males are expected to do works that require a lots of energy.

The result obtained on marital status in Table 3 revealed that 84.3% were married while 15.7% were single. The marital status revealed a sense of responsibility on the side of the fatteners and it also shows that sheep fattening is a means of livelihood for most fatteners in Kano metropolis. This is in line with the findings on Socio-economic Characteristics of Yankasa Sheep and West African Dwarf Goat's Farmers and their Production Constraints in Lafia, Nigeria of Hassan, Mbap and Naibi, (2015) who reported majority of their respondents were married.

Table 3 also shows that a substantial number of Sheep fatteners (62.4%) in Kano metropolis have formal education while (38.6%) have attended Qur'anic schools. By implication, reasonable number of fatteners should be able to understand the use of improved technologies and apply it to achieve positive results. Thus sheep fatteners in the area will easily adopt new techniques which will improve the level of their production and hence profit. This corroborates with Hassan, Mbap

and Naibi, (2015) in Lafia, Nigeria on Socio-economic Characteristics of Yankasa Sheep and West African Dwarf Goat's Farmers and their Production Constraints, who found out about more than one third of their respondents had formal education up to primary, secondary and tertiary levels. Table 3 further indicated that 71.6% of the sheep fatteners in the study area fattened other livestock such as goat and cattle. 44.3% make use of hired labourers, 24.3% do it by themselves and also make use of family members, while 31.4% use both hired labour and family members. 54.3% of the fatteners had contact with Extension agents(EA) while 45.7% don't have contact with EA because; 18.8% don't have EA's nearby, 3.1% possess the required information, 34.4% don't need their services and 43.7% were not happy with the EA. The study established that 87.1% of fatteners have no access to credit while 12.9% have access to credit which 44.4% get from personal savings, 33.3% from banks and 22.3% from farmers' associations. Sources of information on fattening were radio (15.7%), neighbours (20%), friends and family (40%), research centers (4.3%), community organisations (5.7%), Fliers (1.4%), NGOs (1.4%) and EA (11.4%). The result in Table 3 shows that majority (85.7%) of the farmers are members of some farmer cooperatives while (14.3%) do not belong to any cooperative.

**Table 3: Socio-economic characteristics of the sheep fatteners (n=70)**

Variable	Frequency	Percentage (%)
<b>Sex</b>		
Male	70	100
<b>Marital Status</b>		
Single	11	15.7
Married	59	84.3
<b>Educational Level</b>		
Primary	7	10
Secondary	23	32.9
Tertiary	10	14.3
Adult Education	1	1.4
Vocational	2	2.9
Qur'anic	27	38.6
<b>Other livestock fattened</b>		
Goat	20	28.6
Cattle	50	71.4
<b>Labour type</b>		
Family	17	24.3
Hired	31	44.3
Both	22	31.4
<b>Contact with EA</b>		
Yes	38	54.3
No	32	45.7
<b>Reason for non-contact with EA</b>		
No EA nearby	6	18.8
Possess required information	1	3.1
No need for services	11	34.4
Not happy with EA	14	43.7
<b>Access to Credit</b>		
Yes	9	12.9
No	61	87.1
<b>Source of Credits</b>		
Personal savings	4	44.4
Bank	3	33.3
Farmers association	2	22.3
<b>Source of fattening information</b>		
Radio	11	15.7
Neighbours	14	20
Friends and family	28	40
Research centres	3	4.3
Community Organizations	4	5.7
Fliers	1	1.4
NGOs	1	1.4
EA	8	11.4
<b>Cooperative Membership</b>		
Yes	60	85.7
No	10	14.3

Source: Field Survey, 2021



### **Management Practices of Sheep Fattening**

**Feeding:** Feeds are given to sheep for their survival and for increased body weight, body size and also carcass quality. From the results obtained, 82.9% of the ram fatteners administer feeds to the animals three times a day, while 17.1% administer twice a day. This implies that most of the sheep fatteners in the study area are either feeding the animal ad libitum or rationing the feed for optimum result. This is in contrast to the study reported by Teklebrhan and Urge (2013) who posited that the daily feeding frequency followed by most commercial feedlots farms was twice and only few farms were followed three times of feeding.

**Watering:** Water is the primary constituent in the body of livestock constituting 50%-80% of the live weight of the animal. Water is given to the animal by 34.3% of the respondents depending on the intake of sheep, 30% give them three times a day, 28.6% give them water twice a day and 7.1% give them water once in a day. This finding connotes that watering of animal is not common among fatteners specifically in terms of time and number given. This shows that most of the fatteners do not understand the benefits of watering in sheep fattening. The water intake of fattening animals depends on environmental temperature, the temperature of drinking water itself, the activity of fattening animals, the moisture content of the feed and the amount of feeds fed daily (Kocho, 2007). It was reported by National Research Council [NRC](2007) that when cold drinking water is consumed in large volumes, the temperature of the rumen may decrease, which reduces the activity of rumen microorganisms and this affects the fattening operation.

**Fattening duration:** Sheep are being kept under an intensive feedlot system where food, water, medication and proper care are given to them for some period of time before they are being taken to the market. From the results 47.1% of fatteners fatten sheep according to body weight gained before they're being taken to the market, 44.4% fatten for 5-6 months before sale, 7.1% fatten for three months and 1.4% fatten for four months. There was no definite period of fattening in sheep in the study area given that most of the fatteners practice fattening with no clear fattening duration. This validates the claim of Mohammed (2020) that most fattening cycle of sheep for most rural, peri-urban and urban sheep fatteners, the fattening activities are seasonal which is mainly associated with market demand seasons for fattened sheep and to a smaller extent due to feed availability for fattening.

**Shelter/Shed type:** Shelter is important in livestock production, the animals need a very conducive environment to grow well and not to fall sick easily. From the results shown in Table 4, it was

found out that 71.4% of fatteners make use of a closed type of housing, 20.1% use open type of housing, 7.1% house different breeds separately and 1.4% house different breeds together. This is in conformity with Teklebrhan and Urge (2013) that fattening animals were fed and drunk in group because there had no compartment with a specific dimension in both feeding and watering troughs during physical observation of the farms. Furthermore, most of the shelters were exposed to sun, rain and wind without overhead shed.

**Animal health and treatment:** Animals too fall sick and when they do a proper care and treatment is necessary for them to get well, proper sanitation of the stall should be done to ensure animals good health. From the table presented, 85.7% of fatteners invite trained individuals/doctors to check their sheep, 8.6% take their animals to veterinary clinic for treatment, and 4.3% of the fatteners possess traditional veterinary knowledge while 1.4% have no information. Therefore, the Veterinary doctors or personnel involved in sheep health management programme should have the necessary depth of knowledge about the elements that must be addressed as crucial on animal health control (Mohammed, 2020).

Variable	Frequency	Percentage (%)
<b>Feeding</b>		
Twice a day	12	17.1
Three times a day	58	82.9
<b>Watering</b>		
Once in a day	5	7.1
Two times a day	20	28.6
Three times a day	21	30
Depends on the intake of ram	24	34.3
<b>Fattening duration</b>		
Five or six months' time	31	44.4
Four month	1	1.4
Three month	5	7.1
According to body weight gained	33	47.1
<b>Shelter type and shed</b>		
Open type of housing	14	20.1
Housing different breeds together	1	1.4
Housing different breeds separately	5	7.1
Closed type of housing	50	71.4
<b>Animal health and treatment</b>		
I have no information	1	1.4
Traditional Vet. Knowledge	3	4.3
Treatments by trained doctors	60	85.7

Taking to clinics for treatments 6 8.6

**Table 4: Management practices of sheep fattening (n=70)**

Source: Field Survey, 2021

### Fattener's Preference on Selected Breeds of Sheep

The results presented in Table 5 revealed that *Balami* (47.3%) and *Uda* (48.6%) breed were found to be the leading breeds in the study area. Some fatteners (47.3%) preferred *Balami* in terms of carcass quality (100%), availability (14.3%), fair price (57.2%), large body size (100%), skin type (100%), long ear type (100%), long tail type (100%) and long horn type (100%). While (48.6%) of sheep fatteners in the study area preferred *Uda* in terms of carcass quality (100%), availability (100%), fair price (63.9%), large body size (83.3%), skin type (100%), long ear type (100%), long tail type (100%) and long horn type (97.2%) and the rest of the fatteners (4.1%) preferred *Yankasa* breed in terms of carcass quality (100%), availability (100%), fair price (100%), medium body size (66.7%), skin type (100%), short ear type (100%), short tail type (100%) and short horn type (100%).

This implies that *Balami* breed of ram were preferred by fatteners because of their carcass quality, large body size, skin type, long ears, long tails and long ears while the *Uda* breed of sheep were preferred by fatteners because of their carcass quality, availability, fair price, large body size, skin type, long ears, long tails and long ears and *Yankasa* breeds of sheep were preferred by fatteners because of their carcass quality, availability, fair price, medium body size, skin type, short ears, short tails and short ears. Generally, this implies that the choice of breed types for fattening is mainly based on availability of the breed in the particular area. In developing countries, acceptance of new breeds by farmers is influenced not only by their productive performances but also by non-production traits like beauty and appearance of the animal and cultural values (Ndumu *et al.*, 2008 & Leroy *et al.*, 2015). According to Demeke (2020) findings on physical characteristics of breeding rams, farmers base their selection on colour, body size/length, tail size and appearance, horn presence and appearance and ear size and shape ranked in decreasing order of importance to select rams in southern Ethiopia.

**Table 5: Fattener's preference for selected breeds of sheep (n=70)**

Breeds	Carcass quality	Availability	Fair Price	Body size(S,M,L)	Skin Type	Ear Type (S&L)	Tail Type (S&L)	Horn type (S&L)
<i>Balami</i> (47.3%)	100	14.3	57.2	100L	100	100L	100L	100L

<i>Yankasa</i> (4.1%)	100	100	100	66.7M	100	100S	100S	100S
<i>Uda</i> (48.6%)	100	100	63.9	83.3L	100	100L	100L	97.2L

Source: Field survey, 2021

### Constraints to Sheep Fattening

The result of the study on the constraints faced by the fatteners in their fattening enterprise in Kano Metropolis is presented in Table 6. The result found out that all (100%) of the fatteners indicated high cost of feed ranked highest among the major constraints faced by the sheep fatteners. Pest and disease problems (94.3%), insecurity (94.3%) and High cost of medication (93%) was ranked 2<sup>nd</sup> and 4<sup>th</sup> respectively. Other highly ranked constraints were inadequate capital (91.4%), challenges by middlemen (85.7%), inadequate extension services (75.7%), inadequate infrastructural facilities (75.7%), transportation problems (57.1%) and poor pricing policy (57.1%) were also reported as constraints to sheep fattening. This is in line with the findings of Zalkuwi, Ibrahim and Hyelkaya, (2014) and Ahmed and Egwu, (2014) who reported that the major problems facing the fatteners include high cost of feeds, seasonality of feed, inadequate credit facilities, high cost of medication and inadequate extension services.

**Table 6: Constraints to sheep fattening**

Variable	Frequency	Percentage	Ranking
High cost of feeds	70	100	1 <sup>st</sup>
Pest and disease problems	66	94.3	2 <sup>nd</sup>
Insecurity	66	94.3	2 <sup>nd</sup>
High cost of medications	65	93	4 <sup>th</sup>
Inadequate capital	64	91.4	5 <sup>th</sup>
Challenges by middlemen	60	85.7	6 <sup>th</sup>
Inadequate extension services	53	75.7	7 <sup>th</sup>
Inadequate infrastructural facilities	53	75.7	7 <sup>th</sup>
Transportation problems	40	57.1	9 <sup>th</sup>
Poor pricing policy	40	57.1	9 <sup>th</sup>

Source: Field survey, 2021

## CONCLUSION AND RECOMMENDATIONS

From the findings of this study, it could be concluded that *Uda* and *Balami* were the most preferred breeds by fatteners in the study area. However, the major constraints affecting sheep fattening were high cost of feed, pest and disease problems, Insecurity and high cost of medication.

Based on the findings of this study, the following recommendations were made;

1. From the results of this study, extension services are poor in the study area. Therefore, proper extension services should be provided to the sheep fatteners to enlighten them on new technologies on sheep fattening.
2. Some sheep fatteners keep their sheep for a long period of time before being taken to the market for sale which brings about reduction in the value of the sheep. Therefore, it is recommended that sheep should be fattened for a period of 3-4 months in order to make good profits.
3. Sheep fatteners have little or no access to credits to carry out fattening operations properly. It is recommended that government grants or loans should be made available for sheep fatteners to enable them make good profits from the business.
4. High cost of feeds is the highest ranked constraints in sheep fattening in this study. Therefore, reduced cost of feeds is recommended for profit maximization.
5. Youths should be trained on how to fatten sheep and sheep fattening should be recommended for start-up businesses.

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