

HEDONIC PRICE ANALYSIS OF SHEEP TRAITS AT MARKET LEVEL IN DAMBATTA LIVESTOCK MARKET, DAMBATTA LOCAL GOVERNMENT KANO STATE, NIGERIA

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| Article History | Abstract |
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| Original Research Article | <p><i>The study was conducted to evaluate the hedonic price of sheep characteristics at the market level in Dambatta livestock market, Dambatta Local Government of Kano State, Nigeria. A multistage sampling procedure was used to select 83 sheep buyers, and a structured questionnaire was used to collect information from the sampled population. The collected data was analyzed using multiple regression model to determine the socioeconomic characteristics of the buyers that influence consumers' preferences for sheep and determine the valuable traits and factors determining market prices of sheep in the study area. The results reveal that the coefficients of educational status ($p > 0.05$), marketing experience ($p < 0.1$), and coefficient ($p < 0.01$) of the quantity of sheep purchased by the buyers were the socio-economic factors influence consumer preference for sheep in the study area. The result of hedonic price analysis reveals that the coefficient of live weight 11-20 kg ($p > 0.05$), body condition (lean and fat, $p > 0.1$, respectively), season (early season, $p > 0.1$), and tail type (thin tail, $p > 0.1$) was found to be characteristics influenced the prices of sheep in the study area. The study concluded that there are factors that influence prices of sheep in the study area. The study recommends that animal breeders should develop breeding programs that will focus on improving the genetic potential of sheep for optimal live weights and moderate body conditions. Additionally, they should promote fat-rumped tail breeds to encourage farmers to adopt these desirable tail types, thereby increasing market prices.</i></p> <p>Key words: Hedonic, Sheep, Traits, Season, Demand.</p> |
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Introduction

The demand for livestock products is expected to rise by 70–80% by 2050 due to its rapid growth (Steinfeld, 2012). The main factors contributing to the expected rise in demand are population growth, increasing urbanization, and increased disposable income. The livestock subsector needs particular attention from governments in many countries, especially emerging nations, because its farmers use the most agricultural land globally and the global food system is shifting toward animal-based goods (FAO, 2015). Furthermore, for small and marginal farmers as well as poor landless households in developing countries, livestock is an essential source of income and a risk-reduction strategy

(Ahmad et al. 2019). The operation of livestock markets is vital in developing countries, even though they determine the retail prices that consumers pay as well as the prices and profits that livestock farmers and merchants get. Livestock serves a variety of purposes as an agricultural and financial asset, including supplying energy for transportation and crop cultivation (traction), as well as a source of savings and cash income during difficult times. It is also a major source of revenue for rural people. Better nutritional results for consumers in lower-income situations have been directly linked to the use of animal-sourced foods (ASFs) (e.g., Dror and Allen, 2011; Headey et al., 2018). Animal

protein is distributed unevenly throughout Nigeria and sometimes even within homes. Because they can pay the market price owing to their higher salaries, people who reside in urban regions consume more animal protein than those who live in rural areas (Sanusi and Adewoyin, 2014).

Millions of people living in rural areas, especially Nigeria's small-scale, marginal, and landless farmers, rely on small ruminants for food and sustenance. According to Abubakr (2022), sheep are the second most significant species in Nigeria after goats and cattle. There are about 53,061,143 million people living in Nigeria. Small-ruminant features are varied and show a range of qualitative differences. By looking at some of them based on market price premiums, discounts, and other associated aspects, you can tell the difference between herds. Along with ancestry, sheep and goat sellers put a price on various combinations of traits. The latter pertains to the agro-ecological characteristics of the specific production area. Even though sheep and goats are very important for food security compared to other pets, there isn't much research on their phenotypic and genetic features or how to raise them (Terefa et al. 2024).

Smallholder farmers are less inclined to raise sheep solely for market-oriented sales; thus, cash requirements, feed availability, and sociocultural variables significantly influence their market supply decisions (Kassie et al. 2011, Terfa et al. 2013, Yitayew et al. 2019). It is important to note that consumers are not likely to have the same preferences for animal features since they have quite varied reasons for judging market participation. This means that customers are willing to pay various amounts for animal features. Research on small ruminant market behaviour indicates that animal characteristics, buyer demographics, marketplaces, and seasonal trends significantly affect livestock price formation (Kassie et al. 2011, Yitayew et al. 2019, Ahmed et al. 2019, Zanou et al. 2024). Lancaster's theory of value posits that the unique attributes of a high-quality product dictate its worth in a competitive market (Lancaster 1966). For instance, the amount of money someone is prepared to pay for a given sheep trait is called a hedonic price. This is how to break down the overall cost of the sheep into a fixed price and the values of its traits (Rosen, 1974). The hedonic pricing method, which we use in our work, is being used more and more to figure out the hidden costs that customers put on animal traits. The implicit values of the qualities are evaluated by monitoring consumer purchase behaviours in real or simulated marketplaces. Implicit pricing gauges customers' readiness to pay for specific attributes and mostly relies on their perceived utility, as noted by Lancaster (1966), Sen (1971), and Rosen (1974), referenced in Yitayew et al. (2024). Terfa et al. (2013) assert that sheep characteristics exert a far greater influence on the observed pricing than the types

of customers and sellers or the incentives driving the transactions.

Age, coat, body size, and tail condition were shown to have the most effects on the price given for sheep in central Ethiopia. The basic premise of the study was that animal values are determined mostly by phenotypic and qualitative traits rather than quantitative ones like live weight or carcass weight, as is typical in contemporary markets (Girma et al. 2007 quoted in Kenfo, 2019). Therefore, if the different attributes were appropriately identified and valued, it would be extremely rapid and simple to distribute resources among the several livestock development treatments for the system's commercialization (Kassie 2007 referenced in Kenfo, 2019). Finding sheep market potential will also be made easier by identifying the desired qualities of sheep. Given that consumer wants and tastes are always changing, this is crucial.

Among of the main and largest marketplaces for traded animals in Nigeria's Kano North Zone senatorial area is Dambatta Market. Every Sunday of the week, the market is open. Buhari Hamza (2021) reports that around 5766 sheep and other livestock were exchanged in the market each week. He further emphasized that every week, around 576 individuals from all parts of the nation come to buy sheep and transfer them to other locations; they typically open at 10:00 am and close at 10:00 pm. However, preferences for sheep and other elements (physically visible features) that affect the selling price will be revealed by studies on hedonic pricing analysis of sheep. In order to create market-oriented sheep and offer them to the market in accordance with the preferences of the buyers and sellers, it is crucial to investigate the buyer's revealed preference for indigenous sheep qualities using the hedonic pricing approach. Nevertheless, there is little information available in the research region regarding the various criteria used for sheep marketing, if these attributes have a significant impact on the purchase price, and why they are assessed. In order to ascertain the factors influencing the price of sheep in the Dambatta Local Government market in Kano State, Nigeria, an empirical study on market price analysis is required. In light of the background data mentioned above, the study sought to achieve the following goals:

- i. determine the socio-economics characteristic that influence consumer's preference for sheep
- ii. determine the valuable traits and factors determining market prices of sheep

Methodology of the Study

The Study Area

The study was carried out in Kano State's Dambatta Local Government Area (LGA). The LGA spanned 732 square kilometers (km²) and was located between latitudes 120 14

49° N and 120 36 7.4° N and longitudes 8029 5.7° E and 8049 12° E. It is bordered to the east by the Babura local government unit of Jigawa State and is between Kano and Kazaure, abutting Daura on the way to Katsina State. Makoda Local Government borders it to the west, while Minjibir Local Government Area borders it to the south (Abbas et al., 2018). Farmers make up the majority of the population of Danbatta, the local government area's headquarters. Among the 44 local governments that make up Kano State, it is one of the oldest, having been established in 1976. The local government jurisdiction is located in a savannah environment that has both wet and dry seasons. The wet season runs from April to September, with an average of around 710 mm of rain, whereas the dry season lasts from October to March. The Danbatta local government region has dry season irrigated crops such rice, wheat, and other vegetables as well as rain crops like groundnuts, millet maize, guinea com cowpea, etc. The well-known Thomas Dam is one of the local fish sources. According to the Kano State Ministry of Water and Mineral Resources (2006), the Danbatta local government area is rich in bauxite and silica. Cattle, sheep, goats, camels, domestic birds, ducks, geese, rabbits, donkeys, and horses are among the animals raised in this region. In the Kano Zone Senatorial District, Dambatta Market is one of the largest and most important cattle markets. It's a weekly market that runs on Sundays.

Sampling Techniques

Multistage stage sampling techniques were employed for this investigation. Purposive sampling was utilized in the first stage, and Dambatta Market was selected because it had the highest number of sheep and other animal merchants and customers among the area marketplaces. The total number of sheep buyers at the market during the second stage was supplied by Sarkin Kara, the head of the livestock department, and the study's sample frame, which makes a total population of 576 cattle buyers. The Raosoft sample size calculator was used using a 50% response distribution, a 10% margin error, and a 95% confidence level. As a result, the sample size was 83 in total. Convenience sampling techniques were used to provide a sample questionnaire to 83 sheep buyers.

3.3 Data Collection

The researcher gathered data from sheep buyers and sellers in the study area through a structured questionnaire administered by professional enumerators. The data collected encompasses the socioeconomic attributes of the respondents (such as gender, marital status, educational attainment, occupation, monthly income, household size, etc.) as well as the attributes of sheep (including height,

weight, coat colours, breeds, skin condition, health status, etc.) that affect purchasing decisions.

3.4.2 Inferential Analysis

Multiple regression analysis were adopted to determine the socio-economics characteristic of the buyers that influence consumer's preference for sheep using stata software version 14, while Hedonic price tool of analysis was used to determine the valuable traits factors determining market prices of sheep in Dambatta livestock market using shazam standard edition software, Dambatta local government Kano state, Nigeria.

3.5 Specification of the Models

Hedonic price Regression Analysis

To determine the socio-economic factors that influence the preference of sheep purchase of the buyers, four functional approach to regression analysis was employed and selected the best fit form for the analysis. The regression analysis of sheep marketing is as follows;

$$E_i = \alpha_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + U_i \dots \dots \dots (1)$$

Four functional forms were employed to select the best fit equation. The following form of the equation is shown below.

Linear function:

$$E_i = b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + b_5 X_5 + b_6 X_6 + b_7 X_7 + b_8 X_8 + b_9 X_9 + U_i \dots \dots \dots (2)$$

Exponential function

$$\ln E_i = b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + b_5 X_5 + b_6 X_6 + b_7 X_7 + b_8 X_8 + b_9 X_9 + U_i \dots \dots \dots (3)$$

Semi-Logarithm function:

$$E_i = \ln b_0 + b_1 \ln X_1 + b_2 \ln X_2 + b_3 \ln X_3 + b_4 \ln X_4 + b_5 \ln X_5 + b_6 \ln X_6 + b_7 \ln X_7 + b_8 \ln X_8 + b_9 \ln X_9 \dots \dots \dots (4)$$

Double Logarithm function:

$$\ln E_i = \ln b_0 + b_1 \ln X_1 + b_2 \ln X_2 + b_3 \ln X_3 + b_4 \ln X_4 + b_5 \ln X_5 + b_6 \ln X_6 + b_7 \ln X_7 + b_8 \ln X_8 + b_9 \ln X_9 + U_i \dots \dots \dots (5)$$

Where

E_i is the i^{th} of sheep purchase price.

α_0 is the intercept

X_1 = age of sheep buyers in year (yrs).

X₂ = Gender of the respondent (dummy) a) Male []
(b) Female []

X₃ = Marital status (dummy) a) Single [] (b) Married []
(c) divorced/separated [] (d) Widowed/widower []

X₄ = Household size (No)

X₅ = Level of education (a) Primary school (b) Secondary school
(c) Tertiary institute (d) non-formal education

X₆ = Sheep buying experience in years (yrs)

X₇ = Main occupation of the respondent: Crop and livestock farming [] (b) Livestock farming only (c) Farming and trading (d) Farming and civil service (e) farming and artisanship (f) Others occupation (specify)

X₈ = monthly income ₦

X₉ = number of sheep purchase at a time

and $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8$ and β_9 are the regression parameters to be estimated

3.5.2 Specification of hedonic price tools of analysis

The hedonic price regression model for sheep is expressed as:

$$PS = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10} + b_{11}X_{11} + e \dots \dots \dots (6)$$

Where;

PS = Price of Sheep (₦)

a = Constant

X₁ = Age of the animal (years)

X₂ = live weight (kg)

X₃ = Sex (a) Ram, (b) Ewe (c) Castrated (e) others (specify)

X₄ = Body condition (a) Lean, (b) Moderate, (c) Fat and (d) Very fat (e) others (specify)

X₅ = Breed (a) Yankasa, (b) Uda, (c) Balami (d) West Africa Dwarf (e) others (specify)

X₆ = Coat colour (a) White, (b) Black, (c) Brown (d) mixture (e) creamy () (f) others (specify)

X₇ = Season (a) Early dry, (b) Late dry, (c) Early rainy (d) Late rainy

X₈ = Size (a) small (b) big (c) medium () (d) others (specify)

X₈ = Tail type (a) fat ramped or very fat, (b) fat-tailed, (c) thin-tailed sheep (d) others (specify)

X₉ = Horn (a) long horn (b) short (c) medium (d) hornless (e) others (specify)

X₁₀ = height of sheep (cm).....

X₁₁ = Skin type (a) good skin () (b) partially good () (c) bad (e) others (specify).....

4.2 Socio-Economic Factors Influencing Price Paid by the Buyers

The double-log regression findings in Table 4 show the social and economic factors that affect the price that sheep buyers pay in Dambatta Market. The coefficient of determination (R²) was found to be 0.851, which means that the model's explanatory variables account for about 85.10% of the changes in sheep prices. The F-statistic value of 45.826, which is statistically significant at the 1% level, shows that the model is strong and fits well overall. The educational status variable had a negative coefficient (-0.160) and was statistically significant at the 5% level (p < 0.05). This means that buyers with more education tend to pay less for sheep, probably because they are better at bargaining and know more about the market. Likewise, marketing experience exhibited a negative coefficient (-0.138) and was statistically significant at the 10% level (p < 0.1), suggesting that greater experience in sheep trading improves purchasers' capacity to negotiate reduced purchase prices. These results align with past projections, underscoring the influence of human capital considerations on market price outcomes.

The coefficient of quantity of sheep purchase by the buyers (0.981) was found to have positive effect on the price paid for the sheep purchase and its significant at 1% (P < 0.01) level. This is in line with *a priori* expectation and implies that an increase in quantity of sheep purchase at a time by the sheep buyers will increase the price paid for the sheep purchased. The coefficient of age, gender, occupation variables was found to have positive effect on the price paid by the buyers in Dambatta market but not significant at any level, while the coefficient of marital status and monthly income of the buyers was found to have negative effect on the price paid by the buyers in the study area and also not significant at any level.

Table 1: Socio-economic Factors Influencing Price Paid by the Buyers

| Variables | Coefficient | t-value | Significant |
|-------------------------|------------------|---------|-------------|
| (Constant) | 4.427 | 9.164 | 0.000*** |
| logx1_age | 0.011 | 0.178 | 0.859 |
| logx2_gender | 0.036 | 0.733 | 0.466 |
| logx3_marital | -0.071 | -1.329 | 0.188 |
| logx4_hh | -0.006 | -0.110 | 0.913 |
| logx5_edu | -0.160 | -3.275 | 0.002** |
| logx_exp6 | -0.138 | -2.216 | 0.030* |
| Logx7_occup | 0.004 | 0.075 | 0.940 |
| Logx8_income | -0.007 | -0.122 | 0.903 |
| Logx9_qtysheep | 0.981 | 18.052 | 0.000*** |
| R ² adjusted | 0.833 | | |
| R ₂ | 0.851 | | |
| F-value | 45.862*** | | |

Source: Field Survey Data, 2022 *** Significant at 1% ($p > 0.01$), ** Significant at 5% ($p > 0.05$), * Significant at 10% ($p > 0.1$).

4.4 Estimated Hedonic Regression of Factors that Influence Prices of Sheep

The estimated hedonic pricing model explained 55.51% of the differences in sheep prices at Dambatta Market. This means that the variables used to explain the prices—age, live weight, sex, body condition, breed, coat colour, and season—had a moderate effect on price determination. The rest of the fluctuation is due to things that we can't see, which are included in the error term. The Durbin–Watson value of 1.83449 indicates minor positive first-order autocorrelation in the model, however it stays within an acceptable range for regression analysis.

The findings also show that certain factors have a big effect on the prices of sheep. In particular, live body weight between 11 and 20 kg, body condition (lean and fat), the early dry season, and thin-tailed sheep were statistically significant and showed the expected indicators, showing that they played a big effect in setting prices. On the other hand, age, sex, breed, coat colour, size, horn type, height, and skin type were not statistically significant, which means that their effects on sheep prices were not significantly different from zero in the research area. These results indicate that purchasers in the marketplace prioritise discernible physical and seasonal traits directly associated with productivity and market demand, whilst other factors exert a little influence on pricing selections.

Live weight of sheep

Live weight of sheep was another trait of sheep that affected market prices of sheep. As hypothesized, 11-20 kg of live weight sheep was found to be significant and negatively influenced prices of sheep at 5% level and received low price. Hence sheep with live weight of 11-20kg was found

to fetch 36.23 less premium price compared to baseline category (21-30kg sheep live weight). To market buyers in the study area, the finding suggests that they place a higher value on sheep with heavier live weights (21-30kg), likely due to their greater meat yield, and consequently offer lower prices for lighter sheep (11-20kg). The possible explanation of this finding is that, for fattener's buyers in the study area, the finding suggests that they likely offer lower prices for lighter sheep (11-20kg) because they require more feed and time to reach optimal slaughter weight, increasing production costs, hence increases more profits. Sheep with lighter live weights (11-20kg) likely received lower prices because they have less marketable meat, making them less valuable to buyers compared to heavier sheep (21-30kg), and this will be more preferable for the fattener's buyers

Body condition: Body condition was recognised as a crucial factor influencing sheep pricing in Dambatta Market. As expected, both lean and fat body conditions had a statistically significant negative influence on pricing at the 1% level, meaning that they got lower premium values than the moderate body condition reference group. In particular, sheep with a fat body condition had premiums that were around 29.45% lower than those of moderately conditioned animals. Lean sheep, on the other hand, had premiums that were about 26.11% lower. This result indicates that consumers like sheep with average body condition, probably because they think they are healthier and the meat is better quality. Lean animals may be seen as undernourished, and obese animals may be seen as less efficient for meat yield. So, moderate body condition is a good compromise between health and productivity, which makes these animals more valuable on the market.

However, this finding is different from what Terefa Terefa et al. (2024) found, which was that sheep in better physical condition got significantly higher premium prices, with moderately conditioned sheep getting about 14.6% more. This could mean that market preferences or study contexts are different.

Seasonality: was another characteristic of sheep that had an impact on the prices of sheep on the market. As predicted, the early dry season had a large and favourable effect on sheep prices at the 1% level, and animals sold for higher premium prices. So, buying sheep early in the dry season was shown to get roughly 28.23% more than the baseline category (early raining season). This means that the price of sheep goes up by 28.23% during the start of the dry season. This is probably because demand goes up and supply goes down, which is good for sheep merchants. This conclusion means that sheep farmers and traders can make the most money by timing their sales carefully during the early dry season, when prices are much higher and demand is high.

Tail type: Tail type was found to be a significant determinant of sheep prices in Dambatta Market.

Consistent with a priori expectations, thin-tailed sheep exhibited a statistically significant negative effect on prices at the 1% level, receiving lower premiums compared to the baseline category of fat-rumped sheep. Specifically, thin-tailed sheep were associated with approximately 26.80% lower premium prices, indicating a clear market preference for fat-rumped tail types. This suggests that farmers and traders can enhance their revenue by prioritizing the breeding and marketing of fat-rumped sheep, which command relatively higher prices. The finding aligns with earlier studies such as Gezahegn Gezahegn et al. (2006), who reported that thin- or fat-tailed sheep fetched significantly lower prices than fat-rumped sheep. Similarly, Terfa Terfa et al. (2013) found that sheep with thin and long tails or thin and medium-length tails received 8% and 11.5% lower prices, respectively, compared to long fat-tailed sheep. These results are further corroborated by Terefa Terefa et al. (2024), who observed that fat-tailed sheep had a positive and significant effect on prices at the 1% level, earning approximately 8.3% higher premium prices, thereby reinforcing the importance of tail morphology in livestock market valuation.

Table 2: Estimated Hedonic Regression of Factors that Influence Prices of Sheep

| Variable | Coefficient | t-ratio | p-value |
|--------------------------|-------------|---------|----------|
| Constant | 0.0000 | 4.278 | 0.000*** |
| Age | 0.1669 | 1.186 | 0.241 |
| Live Weight in kg | | | |
| 1-10 | -0.1531 | -1.205 | 0.234 |
| 11-20 | -0.3623 | -2.709 | 0.009** |
| >30 | 0.1119 | 0.8502 | 0.399 |
| Sex | | | |
| Ewe | -0.0725 | -0.5525 | 0.583 |
| Castrated | 0.0133 | 0.1013 | 0.920 |
| Body condition | | | |
| Lean | -0.2611 | -2.048 | 0.046* |
| Fat | -0.2945 | -2.258 | 0.028* |
| Very fat | -0.0191 | -0.1520 | 0.880 |
| Breed | | | |
| Uda | -0.1229 | -1.051 | 0.298 |
| Balami | 0.2064 | 1.366 | 0.178 |
| West African dwarf | -0.0842 | -0.5270 | 0.600 |
| Colour | | | |
| White | 0.0850 | 0.6325 | 0.530 |
| Black | 0.0222 | 0.1674 | 0.868 |
| Brown | 0.0489 | 0.3679 | 0.714 |
| Creamy | -0.2299 | -1.448 | 0.154 |
| Season | | | |
| Early dry season | 0.2823 | 1.846 | 0.071* |
| Late dry season | -0.0704 | -0.5238 | 0.603 |
| Late raining season | -0.0113 | -0.8277 | 0.934 |
| Size | | | |

| | | | |
|--------------------------------|---------|---------|--------|
| Small | 0.2548 | 1.589 | 0.118 |
| Big | -0.1964 | -1.282 | 0.206 |
| Tail type | | | |
| Very fat ramped | -0.0777 | -0.5978 | 0.553 |
| Thin tail | -0.2680 | -1.898 | 0.063* |
| Very thin tail | 0.0156 | 0.1355 | 0.893 |
| Horn type | | | |
| Long horn | -0.0477 | -0.3182 | 0.752 |
| Medium horn | -0.0082 | -0.5424 | 0.957 |
| Horn less | -0.0681 | -0.4926 | 0.624 |
| Height | | | |
| Long leg | -0.0477 | -0.3182 | 0.752 |
| Short leg | 0.0353 | 0.2617 | 0.795 |
| Skin type | | | |
| Partially good skin | 0.1254 | 0.8743 | 0.386 |
| Bad skin | 0.0809 | -0.6899 | 0.493 |
| R ² | 0.5551 | | |
| Durbin-watson statistic | 1.83449 | | |
| Log of the likelihood function | 876.525 | | |

Source: Field Survey Data, 2022 *** Significant at 1% ($p > 0.01$), ** Significant at 5% ($p > 0.05$), * Significant at 10% ($p > 0.1$).

Reference group (dominant characteristics)

Live Weight in kg: 21-30

Sex: Ram

Body condition: Moderated

Breed: Yankasa

Skin Colour: Mixture

Season: Early raining season

Size of the body: Medium

Tail type: Fat ramped

Horn type: Short horn

Height: Medium leg

Skin type: Good skin

Conclusion and recommendation

Based on the findings of the study, the study concluded that educational status, marketing experience quantity of sheep purchase by the buyers were the socioeconomic factors influence the price paid by the buyers, while live weight, body condition and Tail type were the factors influence the price of sheep in the study area. The study recommends that:

1. Breeding and Genetics: The goal of animal breeders' plans should be to enhance sheep's genetic potential for ideal live weights and mild body conditions. They should also encourage farmers to adopt these desired tail kinds by promoting fat-rumped tail breeds, which would raise market prices.
2. Sheep marketers should adopt nutrition and feeding practices by giving farmers the tools and

training they need to optimize feeding strategies, guaranteeing that sheep reach ideal live weights and body conditions, and creating feed supplementation programs that will provide farmers with incentives or subsidies to obtain high-quality feed supplements, improving sheep growth and productivity.

3. Seasonal marketing strategies should be adopted by the sheep marketers so as to encourage farmers and market agents to take advantage of higher prices during the early dry season by adjusting their marketing strategies, and off-season production should be promoted by incentivizing farmers to produce sheep during the off-season (early rainy season) to reduce market gluts and improve prices.
4. Extension workers should provide training and extension services by offering regular training and advisory services to farmers on best practices for sheep production, nutrition, and marketing. Disseminate market information should be Established a market information system to provide farmers and market agents with timely and accurate information on market prices, trends, and demands.

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