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Determinants of Sheep Price in Kaduna State, Nigeria

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Abstract

Information on a sample of 320 sheep was collected through direct observation of transaction between buyers and sellers in the four selected sheep markets of Kaduna State, Nigeria for a period of 26 weeks. The broad objective of the paper was to examine the determinants of sheep price in the study area. The data were analyzed using descriptive and inferential statistics using hedonic price model. It was established that, other things being equal, sex, breeds and body condition of the animal were the major determinants of sheep price variation in the study area. The consumers are ready and willing to pay a high premium price for male animal, animal of fat body condition and Yankasa indigenous breeds than their counterparts. However, market location and age of the animal do not explained the variability in their sheep price. The study recommends the introduction of a standard weighing system to replace the existing haggling method.

Keywords: Hedonic price, Breeds, Body Condition, Kaduna*.*

Introduction

The climate of Kaduna State supports different kinds of livestock production. Small ruminants (sheep and goat) are important in the subsistence farming system and general livelihood of the communities in the study area. Sheep are among the important ruminants marketed in the study area. Sheep plays an important role in income generation, livelihood diversification, mixed farming and the agricultural farming systems in general through provision of manure in Nigeria and other developing countries. Sheep is one of the most important specie of small-ruminant livestock sub-sector, it plays an important role in rural income generation, livelihood and food security among rural households in Nigeria, and it is considered as a means of diversification and as coping mechanism against crop failure due weather and climatic changes. The increasing gap between animal protein demand and supply is a source of concern to households and policy makers. Hence, they make a very valuable contribution to household income especially to the poor in the rural areas. The small size of sheep and goats has distinct economic, managerial, and biological advantage. Economically, low individual values mean a small initial investment and corresponding to small risk of loss by animal death (Maikasuwa and Jabo, 2014). The problem of feeding sheep is considered to affect its marketing, sometimes the feeds are quite expensive and not affordable even if available and it could affect price of sheep, therefore, it became important to examine the factors that affect sheep price in the study area. Sheep in Northern Nigeria has ceremonial importance. Sheep are predominantly breeds for ceremonial slaughter in Nigeria. They are required for Islamic festival (*Salah festival*), naming ceremonies and marriages. Sheep, goats and cattle in Nigeria are regularly consumed for meat, it is often consumed daily roasted at meat joints and is regarded as sources of prestige by the Fulani's.

Managerially, women, small children and elderly, conveniently can rear sheep. The animal has advantage of occupy it little housing space, have lower feed requirements, and supply both meat and milk in quantities suitable for immediate family consumption (Maikasuwa and Jabo, 2014).

This attribute may partly be due to their lower feed requirements compared to cattle, because of their body size (Okunlola *et al*., 2010). Their short reproductive cycle allows them to quickly recover from rapid resumption of breeding following a drought or devastating disease infestation. Thus, rearing of sheep and goats provide the easiest and a readily accessible source of finance to meet immediate social and financial obligations (Isaac and Titilayo, 2009).

In Nigeria, Sheep and goats play a significant role in the food chain and overall livelihoods of rural households, where they are largely the property of women and their children (Lebbie, 2004). Okali and Samberg (2003) stated that, Nigeria has a population of 40.8 million goats and 27 million sheep. Sheep are reared for various reasons such as income generation, religious purpose, household consumption and hobby as well as security against crop failure. Before now, sheep and goats production has followed the conventional agricultural production systems relying on external inputs and the development of animal breeds, which respond well to increasing demand for nutrient-rich feed. It was observed that, sheep are cheaper to purchase, require less capital and its marketing is relatively easier compared to cattle.

The importance of small ruminant animals (sheep and goats) in the livestock industry in Nigeria cannot be overstressed. The sheep has an important role to play in the farming system and the general livelihood of the communities in the state. Sheep and goats represent about 63.7% of the total grazing domestic animals in Nigeria (Gefu and Adu, 1984). Sheep is one of the small ruminant animals that are regularly consumed for meat, which is often roasted in the market and used as ceremonial dishes as well as religious and cultural festivities. It is cheaper to purchase required less capital and it is marketing is relatively easier compared to cattle and to camels. Their consumption ranks second to beef (Gefu and Adu, 1984).

Moreover, there are problems of difficulty of marketing channels, price differentials between markets in different sites and marketing costs. Additionally, there is very little information on sheep marketing and pricing mechanism especially in the study area. The influence of season on the price was not the interest of this study, as the data collected does not fall much on the festive month. The aspects of sheep marketing have not received any studies in Giwa, Galadimawa and Zaria Local Government Areas of Kaduna State. The data on the marketing and price of sheep are limited, because sheep marketing is entirely a traditional activity in Nigeria setting associated with haggling and visual inspection as a mechanism for price. There is also inadequate empirical information on the potential and constraints of marketing sheep. In order to attract policy attention, it is necessary to generate empirical information on marketing system of sheep in Giwa and Zaria of Kaduna state. This empirical information and gap between demand and make it important to study hence this study attempts to bridge the gap by providing the first hand information on the price analysis of sheep marketing in the study areas.

Methodology

The Study Area

The study was conducted in Giwa, Zaria and Galadimawa markets of Kaduna state North-Western Nigeria. The climate of the state supports different kinds of livestock production. The selected markets are among the major supplies of small ruminants in the state and the nation in general. Kaduna State lies between latitudes 10^0 and and 11^031'N longitudes 7^030' and 9^0E of the prime meridian. The weather is characterized by dry and wet seasons with temperature that ranges between 28^0C and 34^0C. Hammattan season start between November and end in February, the

raining season fall between May to October. The vegetation of the state is Sudan savannah agro-ecological zone. Farming is the main occupation of the people in the area with emphasis on the cultivation of 34 cereals like maize, sorghum, rice, millet and legumes like cowpea, soya bean and groundnut, which are rain fed and livestock production Kaduna State Government (www.kdsg.gov.ng, 2018).

The markets are comprised both large and small ruminant animals .The first part of the market is for the small ruminant (sheep and goats) while the other part is for large ruminant (cattle only). The two types of animals are separated by ordinary space and passages are made available to ease movement and transaction agents, wholesalers, retailers and consumers (buyers).

Data Collection

There are several livestock markets location in each major towns and cities. For the purpose of this study, only four markets based on the tempo of marketing transaction and supply of sheep were purposively selected to represents the rest of the markets in Kaduna State. A trained extension officer collected the data used for this study on weekly basis for each market for six months (26 weeks) from January to June, 2016. However, no data on festive seasons were recorded. Three breeds of sheep; *Balami, Uda* and *Yankasa* were identified in the markets studied. Information on the sample of 360 sheep was collected through direct observation of the haggling traction between buyers and seller. The price of the animal was traditionally determined through the visual observation of the physical characteristics of the animal such as body fatness, age, hair condition, presence of any deformity, skin colour as well as sex. Thoracic and chest of the animal were touched for confirmation of observed physical characteristics. The price agreed upon by the buyer and sellers were recorded after reaching agreed price.

The prices recorded were used as dependent variable to run a hedonic price model form of multiple regression analysis against observed physical characteristics and market related independent variables. The hedonic price model was applied by many scholar for example (Oludimu and Owokade 1995; Jabbar 1997; Adugna 2006; Jabo and Mohammed, 2009 and Afzal *et al*, 2011). The model is based on the hypothesis that product have utility bearing attributes and that the value of those attributes contribute to the price of the product (Jabbar, 1997).

The model can be presented as;

$$P_{ijklmp} = AGG_i + SEX_j + BRD_k + CON_l + LOC_m + BUY_P + \mu \quad ---------- 1$$

Where:
Pijklmp =Price of the animal (₦)
AGGi = Fixed effects of age of the animal
SEXj =Fixed effect of sex of the animal (2 levels)
BRDk = Fixed effect of breed of the animal (3 levels)
CONl = Fixed effect of body condition of the animal (3 levels)
LOCm = Fixed effect of market location distance to market place in KM
BUYp= Fixed Effects of Buyer type (3 levels)
μ = Stochastic Error Term

Results and Discussion

Characteristics of the sampled animals

Table 1 presents the results of descriptive statistics of the sampled sheep from the four markets. Of all the 320 animals prices recorded in the markets, 61.25 % were male while the remaining 38.75% were male. This shows that, male sheep dominates the market as compared to its female counterpart. This is true due to the fact that, pastoralist considered selling female animal as the last option, more so, female animal were not frequently slaughtered due to expectation of a pregnancy. Likewise, majority of the animals transacted in the markets are moderate body condition (50%), 32.5% fat and 17.5% lean body condition. This shows that farmers prefer to sell moderately fat animals in non-festive period, while most of the fattened animals were reserved for marketing during *Eidil Kabir* festival. The animal fatteners usually target a particular season of the, however, in the event of feed or food shortages the animal can be disposed up to market for meeting family pressing needs. Three breed of sheep are distinguished, namely *Uda, Balami* and *Yankasa*. However, majority of the animals traded (58.75) are *Yankasa,* meaning indigenous animal breeds. It was equally reported that, majority (63.2%) of the sheep in the four markets studied falls within the age bracket of 1-2 years. This agrees with Azfal, *et al,* 2011 who reported those 1 to 2 years of age of sheep and goat to be highly demanded hence consumers can pay a premium price for this category of animal and the price of the animal is expected to increase with age but later declined as the animal grow older.

Table 1 Characteristics of the sampled Sheep

Variable	Frequency	Percentage
Breed		
Balami	40	12.5
Uda	92	28.75
Yankasa	188	58.75
Total	**320**	**100**
Sex		
Male	196	61.25
Female	124	38.75
Total	**320**	**100**
Age		
<1 year	81	25.5
1 year	103	32.19
2 years	98	30.63
3 years	33	10.31
4 years	2	0.63
5 years	1	0.31
Total	**320**	**100**
Body Condition		
Fat	104	32.5
Moderate	160	50.0
Lean	56	17.5
Total	**320**	**100**

N=320

Results of the Multiple Regression Analysis on the Determinants of Sheep Price

Multiple regression models was used in order to identify animal and market characteristics that influence variations in prices and evaluate their relative importance, in which hedonic price model was found to best fit the data. The sheep price was regressed against the age, sex, animal body condition, breed and type of buyer. The co-efficient of determinations R-square value (0.958) was considered adequate in predicting 95.8% variability in the dependent variable (price) see table 2. Among all the variables included in the model, sex of the animal, breed and body condition has significant relationship with animal price, but at different levels. However, age of the animals, market location and buyer type have no statistical significant influence on the sheep price in the study area.

Sex

Sex has a negative effect on the price of the animal as indicated by it coefficient, this implies that buyers pay less premium price for female animal as compared to male. The inverse relationship between price of animal and sex implies that, other things being equal price per head of male sheep of the same traits is higher than that of female. This is expected because female animals in the markets studied were mainly culled due to their age or low productivity of infertility. This is in agreement with Jabbar (1998) who reported similar scenario in Southern part of Nigeria.

Breed of the animal

The study shows that, breed of the animal *Uda* and *Yankasa* are among the important biological variables that have significant and positive relationship with animal price ($P<0.05$). The could be because of the fact that *Yankasa* is the common and predominant breed loved by majority of people in the study area. Breed of the animal is a proxy for its body weight, feed conversion efficiency and to some extent palatability of its meat. This is in agreement with Jabbar (1995) who reported that, sex, body condition and live weight as the most important biological characteristics of small-ruminants that influence the decision of the buyer to pay for premium price for the animals.

Body condition

It was hypothesized that, body condition of an animal has a strong and positive relationship with price of the animal. As expected, the coefficient of very fat animal body condition has a positive and statistically significant relationship ($p<0.01$) with the price of the animal. This implies that, a consumer would pay a high price for a very fat sheep as compared to fat or lean animal. The body condition of the animal can serve as a proxy for the health condition and the meat quality of the animal. This agrees with Muazu (2006) who reported positive and significant relationship between price of sheep and body condition in Zamfara State, Nigeria.

Table 2: Determinants of Sheep Price during Festive season

Variable	Coefficients	T value
Age	0.386ns (210.91)	0.892
Sex	0.038* (1821.07)	-2.245
Uda	0.022* (8509.03)	2.564
Yankasa	0.025* (7431.35)	2.494
Fat	0.848ns (3859.63)	0.195
Very fat	0.001** (7684.00)	4.214
Location	0.348ns (2085.80)	-0.968
Butcher	0.539ns (6203.82)	0.628
Com. Agent	0.846ns (5792.15)	-0.198
Merchant	0.140ns (9328.81)	1.557
R-square	0.958	

Dependent Variable: Sheep Price () figures in parentheses are standard errors
Ns= not significant *, **, implies p<0.01 and 0.05 respectively

Conclusion and Recommendations

The study concludes that, other things being equal, sex, breeds and body condition of the animal were the major determinants of sheep price variation in the study area. The consumers are ready and willing to pay a high premium price for male animal, animal of fat body condition and *Yankasa* indigenous breeds than their counterparts. These biological traits are believed to affect the animal health conditions, meat quality and tenderness, palatability and preference among consumers. *Yankasa* sheep breed enjoy wide acceptability and high preferences due to its white coat color believed to attract more reward, hence highly recommended for sacrifice. The predominant sex of the animals supplied to the markets studied is male. Majority of sheep traded were of moderate body condition, since fat and very fat animals are targeted for *Eid* festive periods. Most animal in the market studied falls within 1-2 years age bracket. The study recommends the introduction of a standard weighing system to replace the existing haggling method. Through this, a standard live weight price for the animal can be arrived at for a more efficient pricing mechanism for both buyers and seller.

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