

BREED AND SEX INFLUENCE ON BODY CONDITION SCORE (BCS) OF SHEEP

Dafur, B. S^{*}, Mbap, S. T., Ibrahim, T^{*}. & Mancha, Y. P⁺

^{*}*Department of Animal Production, University of Jos*

⁺*Department of Animal Production, Abubakar Tafawa Balewa University, Bauchi*

Corresponding author: bdafur70@gmail.com, 08036085311

ABSTRACT

This study was conducted to assess the effect of breed and sex on body condition score (BCS) of some sheep raised at Federal College of Education, Pankshin Research Farm in Plateau state. The BCS data were obtained from two hundred and twenty (220) sheep comprising 46 Balami (26 females: 20 males), 44 Uda (21 females: 23 males), 63 WAD (33 females: 30 males) and 67 Yankasa (32 females: 35 males) at the age of 1 year based on the BCS scale of 0 - 5. Data were analyzed with statistical package for social science version 22.0. Results indicated that WAD and Yankasa had higher ($p < 0.05$) BCS than Balami and Uda, while males were superior ($p < 0.05$) to females. It is concluded that breed and sex influence BCS of sheep.

Keywords: Sheep, Breed, Sex, BCS, Nigeria

INTRODUCTION

Body condition score (BCS), an estimate of the muscle and fat cover of an animal by palpation of different regions of the body, was originally described by Jefferies (1961) in Scotland sheep. It consists of a scale of six scores, from 0 to 5, based on the concept that subjectively assessed condition score is closely related to the amount of chemically determined fat in sheep (Russel *et al.*, 1969). It is an estimate of body reserves (Edea, 2008). The BCS method has been applied on various sheep breeds such as Avagonesa (Purroy, 1997), Bermagasia (Susmel *et al.*, 1995), Awassi (Treacher and Filo, 1995), Sarda (Ligios *et al.*, 1995) and Lacaune (Bocquier *et al.*, 1999). Body condition scores have been widely adopted for managing the nutrition of flock, especially on grazing, and for selecting lambs for purchase and slaughter (Jalilian and Moeini, 2007). In most studies, BCS provides a better prediction of body composition than live weight (Russel *et al.*, 1969; Sanson *et al.*, 1993).

Stockmen in several countries usually appraise animal condition in verbal terms such as “fair, bad, good, lean, fat” which are often ambiguous (Woldemariam, 2005). Over the years, several attempts have been made to formalize body condition scores using numerical values. A system based on six points scale was described by Boden (1991). Russel *et al.* (1969) showed that subjective body condition scores were closely related to the amount of chemically determined fat in sheep and could provide acceptable and useful means of estimating the proportion of fat in the body. In recent years, the system has been improved with better guidelines. According to Boden (1991);

- i. An assessment is made of the prominence (the degree of sharpness or roundness) of the spinous process of the lumbar vertebrae.
- ii. The prominence and the degree of fat cover of the transverse process of the vertebrae were also assessed.
- iii. The extent of the muscular and fatty tissues below the transverse process were judged by the ease with which the fingers pass under the ends of the bones.
- iv. The fullness of the muscle area and degree of fat cover in the angle between the spinous and transverse process estimated.

The purpose of this study is to determine the effect of breed and sex on body condition score of some Nigerian sheep.

MATERIALS AND METHOD

Location and climate

The research was carried out in Pankshin town, Jos Plateau. The Jos Plateau has been described by PADP (2000), WWF (2001) and Plateau State Government Organization (2004). It is a pear-shaped upland located in the middle of Nigeria between latitude 8° and 10° north and longitudes 7° and 11° east, at an average attitude of 1,200m above sea level and reaches the highest peak in the Shere Hills where it stands at 1,766m.

Sheep used and management

The study sheep comprised 220 sheep (46 Balami, 44 Uda, 63 West African Dwarf sheep and 67 Yankasa) reared at Federal College of Education, Pankshin Research Farm. sheep were managed under the traditional free-range in the dry season. In the rainy season when arable crops were growing, animals were kept under semi-intensive management. Under this system, sheep were taken out for grazing by a shepherd from late morning till evening. Sometimes supplementary feeds (hay and household waste) were fed.

Body condition scores

The body condition scores (BCS) were assessed by combining palpation of the sheep in the lumber region and around the backbone in the loin area immediately behind the last rib, as suggested by Boden (1991) and the guidelines (Figure 1). The scores used in the study were 1.0, 2.0, 3.0, 4.0 and 5.0 for emaciated, thin, average, fat and obese respectively. Cases which did not fit these categories properly, i.e fell between whole numbers were assigned half scores as recommended by Thompson and Meyer (1994) and additional scores of 1.5, 2.5 and 3.5 were therefore used.

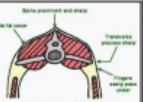
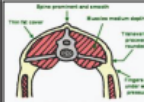
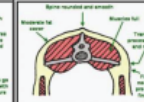
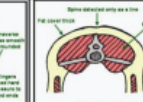
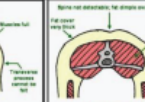
Spines	Individually clearly felt, sharp, obvious	Forms a smooth line with smooth undulations	Only slightly detectable undulations	Only detectable with firm pressure	Not detectable
Transverse Process	Fingers easily pass underneath	Smooth round edges	Well covered, have to push firmly to get fingers underneath	Cannot be felt at all	
Muscle	Very little concave	Concave	Not concave, Not convex	Minimally developed convex	
Fat Layer	No	Very thin	Moderate	Thick	very thick to form a dp along top midline
Condition score					

Figure 1: Body condition scoring of sheep Source: Woldemariam, 2005.

Statistical analysis

Data generated were analyzed using the General Linear Model (GLM) of SPSS (Statistical Packages for Social Sciences, 2013) version 22.0, differences between breed and sex in BCS were determined. Ryan-Einot-Gabriel-Welsch post hoc-test was performed to separate means of breeds that were statistically different. The final model used is as follows

$$Y_{ij} = \mu + B_i + S_j + E_{ij}$$

Where:

Y_{ij} = individual observation on the animal for the i^{th} breed and j^{th} sex

μ = overall mean

B_i = effect of the i^{th} breed ($i=1,2,3,4$)

S_j = effect of the j^{th} sex ($j=1,2$)

E_{ij} = random error

RESULTS AND DISCUSSION

Table 1 shows BCS of sheep by breed and sex. Breed had significant ($p<0.01$) effect on BCS. West African Dwarf Sheep (WAD) and Yankasa with respective mean BCS of 3.21 and 3.20 did not significantly differ but were superior to Balami and Uda which had BCS of 2.67 and 2.79, respectively. However, Balami and Uda did not differ in BCS. Male sheep had mean BCS of 3.56 which was significantly ($p<0.01$) higher than the 2.56 in females.

In the present study, WAD and Yankasa had higher BCS's than the larger breeds (Uda and Balami). This is similar to some previous reports. Edea (2008) recorded higher BCS (3.23) in Horro than (2.71) in Bonga. Frutos *et al.* (1995) found higher internal fats and BCS in Churra than Merino. They further stated that the distribution of internal fat varied between the two breeds; the Churra breed had higher omental but lower mesenteric fat. Similarly, in a comparison between Sarda and Lacane breeds to using BCS scores between 1 and 3.5, Ronchi *et al.* (1993) found that 60% of the former had BCS higher than 2.3 while only 40% of the latter had values higher than 2.3. Gizau *et al.* (2013) found higher overall mean BCS (2.04 ± 0.04) in Afar than Menz breed (1.9 ± 0.03). Laxta breed had also been found to have lower BCS (2.66) than Gallega (2.76) (Osoro *et al.*, 2002). Olthoff and Dickerson (1989) asserted that genetic differences exist in distribution of body scores in sheep. Purroy (1997) also observed that the range of BCS variation depends on the breed, due to difference in skeletal proportion, rating among muscle and fat and, the type of deposits.

In the present study, male sheep had higher BCS than female. This corroborates the report of Gizau *et al.* (2013) in each of Afar and Menz breeds. However, Ma'aruf *et al.* (2018) reported non-significant effect of sex on BCS of Yankasa sheep in Kano. The higher BCS in WAD and Yankasa despite higher than Uda and Balami, is an indication that these breeds are better adapted to the environment.

CONCLUSION

It is concluded that West African Dwarf and Yankasa sheep have similar BCS which were higher than those of Balami and Uda sheep. Male sheep have higher BCS than females.

Table 1: Body condition scores of sheep by breed and sex

	Body condition score Means $\pm$ standard error
Breed	
Balami	2.67 ± 1.73^a
Uda	2.79 ± 1.69^a
WAD	3.21 ± 1.23^b
Yankasa	3.20 ± 1.41^b
Sex	
Male	3.56 ± 1.20^a
Female	2.56 ± 1.62^b

Means in the same column with different superscripts differ significantly, ($p < 0.01$)

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