ABSTRACT

Data on birth weights (BW) and weaning weights (WW) in lambs of Yankasa, West African dwarf (WAD) breeds and their crosses were analyzed. The effects of breed, parity, sex, type of birth, management system and season were determined. Yankasa lambs had the highest mean BW (2.57kg) which was significantly (P < 0.05) higher than that of WAD (1.68kg) and their crosses (2.05kg). Breed, parity, sex, type of birth and season had significant (P< 0.05) effect BW and WW. Male lambs in comparison with female lambs had higher (P < 0.05) BW and WW while single-born lambs in comparison with multiple-born lambs had higher (P < 0.05) WW. A highly significant positive correlation (0.719) was estimated between BW and WW of lambs across breed. It was concluded that the differences in factors influencing BW and WW at early phases might have risen from the variation among breeds and factors monitored. Therefore, BW and WW could provide useful information for early selection criteria in breeding programmes, serving as an important role in expression of genetic potential in lambs.

Keywords: Birth weight, weaning weight, Yankasa, West African Dwarf, Sex, Birth type.

INTRODUCTION

The Yankasa and West African dwarf breeds of sheep are the most common in Southern Nigeria and both breeds are well adapted to the environmental conditions under which they live (Adu and Ngere, 1979). They have great capacity for making good use of low quality feed resources and serve as a source of income generation to many rural farmers through sale of meat and lambs (Fasae et al., 2011). There is a wide diversity in various production traits of these breeds which suggests that there is a great scope for improvement of the performance traits. Any breed development programme is based on the exploitation of genetic variation (Babar et al., 2004).

The importance of birth and weaning weights in evaluating the breeding potentialities of domestic animals at an early age has long been recognized by livestock breeders. Birth and weaning weights of lambs are not only been influenced by genetic factors but also by physiological and environmental factors (Mandal et al., 2006). Birth weight is an important parameter in meat producing animals because it is strongly correlated with
growth rate and adult size and also the vi-
ability of new born animals, while weaning 
weight has a high relative economic impor-
tance to the farmer. Hence, more informa-
tion on these factors is needed to determine 
the effectiveness of selection based on these 
characters. This study therefore aimed at 
gaining information on the relative 
impor-
tance of some factors that influence birth 
and weaning weight in lambs of Yankasa, 
West African dwarf and their crosses.

MATERIALS AND METHODS
Experimental Animals and their man-
agement
A total of 105 lambs consisting of 42 
Yankasa lambs, 38 West African Dwarf 
lambs and 25 crosses of the Yankasa and 
West African Dwarf were used for the ex-
periment. The animals belonged to farmers 
in Odeda local government area of Ogun 
state, Nigeria. Prior to the experiment, preg-
nant ewes were identified and monitored 
after agreement with the owners.

The animals were managed under semi in-
tensive and extensive systems. Those man-
aged semi intensively were allowed to graze 
freely in the morning to later return to their 
owners in the late evening. They were also 
frequently fed with yam and cassava wastes 
as well as other by-products from process-
ing of agricultural products.

Data Collection
Birth weights of lambs were taken after par-
turition using a weighing scale. Also, the 
weekly weight gains were taken and re-
corded from the first week after birth up to 
12 weeks at weaning. Factors such as type 
of birth (single or multiple births), breed 
and sex of lamb, dam parity and manage-
ment system were also obtained through 
animal observation and from records kept 
by owners.

Statistical Analysis
The effects of breed, sex, dam parity, birth 
type and management systems on birth and 
weaning weights were analyzed (SAS, 1999). 
Correlation coefficient was used to deter-
mine the relationship between the birth and 
weaning weight.

RESULTS AND DISCUSSION
The effect of breed, sex and management 
system on birth weight (BW) and weaning 
weight (WW) of Yankasa, West African 
Dwarf (WAD) and their crosses are shown 
in Table 1. There were variations in BW due 
to breed, sex and management system. This 
corroborates earlier reports on tropical 
breeds of sheep and goats (Josephina et al., 
1980, Thiruvenkadan et al., 2009). A mean of 
2.57kg, 1.68kg and 2.05kg BW were ob-
served for Yankasa, WAD and their crosses, 
respectively. Yankasa lambs were 1.19kg and 
0.82kg heavier (P<0.05) than the WAD and 
their crosses respectively at birth, while the 
crosses were similar (P>0.05) to WAD at 
birth. However, the values for BW of 
Yankasa lambs were similar to 2.80 ± 0.19 
reported by Adu et al. (1979) for the same 
breed of sheep.

The mean values for WW of Yankasa, WAD 
and their crosses were 10.87kg, 8.55kg and 
9.83kg, respectively. Yankasa lambs were 
2.32kg and 1.04kg heavier (P<0.05) than the 
WAD and their crosses, respectively, while 
the crosses were 1.28kg heavier (P<0.05) 
than the WAD at weaning. These observa-
tions may be due to the effect of weight at 
birth as well as management practices em-
ployed on the animals. However, the 
Yankasa breed of sheep has earlier been re-
ported to be bigger than WAD sheep 
(Adewumi et al., 2009).
The sex of lambs also had effect on BW and WW across breed. Rams were 0.24kg and 0.34kg heavier (P<0.05) than ewes at birth and weaning, respectively. This is in consonance with the observation of Brown and Jackson (1995) that rams exceeded ewes by 0.2 kg and 0.6 kg at birth and weaning, respectively while Rashidi et al. (2008) reported that males had 0.16kg and 1.92kg higher BW and WW in comparison to females in Kermani lambs. High BW of ram lambs and significant effect of sex on BW has also been reported for various breeds of sheep (Iyeghe et al., 1996; Sivakumar et al., 2006; Saghi et al., 2007; Gardner et al., 2007). Higher growth in prenatal stage under the influence of male sex hormones with anabolic effect might be the reason for higher BW in male lambs (Hafez, 1962).

The effect of management system on BW and WW of lambs under semi-intensive and extensive system were similar (P > 0.05). The level of management could vary due to the in-ability of sheep rearers to take adequate care of the animals, availability of financial resources and culling strategies. In addition, season had significant (P < 0.05) effect on BW and WW of sheep among breeds. Lambs born in the wet season were heavier (P < 0.05) than those lambed in the dry season. Lambs born in the wet season could have had a favourable environmental condition with good availability of the fodder during the gestation period, which might have contributed to higher BW. Moreover, the variation in BW and WW of animals across season has been attributed to management, selection of bucks, environmental con-

<table>
<thead>
<tr>
<th>Factors</th>
<th>Number of Lambs</th>
<th>Birth weight (kg)</th>
<th>Weaning weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Breed</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yankasa</td>
<td>42</td>
<td>2.87±0.11a</td>
<td>10.87±0.40a</td>
</tr>
<tr>
<td>WAD</td>
<td>38</td>
<td>1.68±0.07b</td>
<td>8.55±0.37c</td>
</tr>
<tr>
<td>Crosses</td>
<td>25</td>
<td>2.05±0.09b</td>
<td>9.83±0.39b</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>47</td>
<td>2.08±0.08b</td>
<td>9.58±0.30b</td>
</tr>
<tr>
<td>Male</td>
<td>58</td>
<td>2.32±0.10a</td>
<td>9.92±0.32a</td>
</tr>
<tr>
<td><strong>Management System</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semi-intensive</td>
<td>56</td>
<td>2.20 ±0.09</td>
<td>9.23±0.29</td>
</tr>
<tr>
<td>Extensive</td>
<td>49</td>
<td>2.16 ±0.08</td>
<td>9.77±0.31</td>
</tr>
<tr>
<td><strong>Season</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wet</td>
<td>60</td>
<td>2.51±0.10a</td>
<td>9.69±0.31a</td>
</tr>
<tr>
<td>Dry</td>
<td>45</td>
<td>2.19±0.08b</td>
<td>8.86±0.28b</td>
</tr>
</tbody>
</table>

\[a,b,c\] Mean in the same column with different superscripts are significant (P < 0.05)
ditions such as ambient temperature, humidity and rainfall (Thiruvenkadan et al., 2009).

The effect of type of birth and parity on BW and WW across sheep breeds are shown in Table 2. BW for singles and twins were similar (P > 0.05) with 2.20 and 2.19kg, respectively, while WW of single lambs was higher (P < 0.05) than that of twins. This corresponds with the observations of Josephina et al. (1980) and Saghi et al. (2007) which may be due to competition between the twins for dam’s milk and other nutrients. It is therefore suggested that since the type of birth was not significant at birth but ended up being significant at weaning, dams having multiple birth should be given extra concentrate for increased milk production as this will compensate for her higher number of lambs. Also, lambs from multiple births should be given to extra supplement feed to compensate for the shared feed and milk.

Parity had significant effect (P < 0.05) on BW of the lambs. The results showed that BW of lambs at first parity was least and increased significantly to the third parity after which it was consistent till the fifth parity, which contradicts the findings of Mandal et al. (2003) and Thiruvenkadan et al. (2008) in Muzaffarnagari and Mecheri breeds of sheep, respectively. This could be attributed to breed difference as well as management system. Moreover, an improvement in WW with increased parity agrees with the findings of Osinowo et al. (1992). Reproductive efficiency can be said to improve with parity as shown by the improvement in WW of lambs with increased parity. Therefore it may be suggested that it will be unwise to cull an ewe based on the performance of her first parity, rather the ewe should be serviced and used up to the third parity while giving adequate flushing and steaming-up diets before making a decision.

Table 2: Effect of type of birth and parity on birth weight and weaning weight of Lambs of Yankasa, West African Dwarf and their crosses.

<table>
<thead>
<tr>
<th>Factors</th>
<th>Number of Lambs</th>
<th>Birth weight (kg)</th>
<th>Weaning weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of Birth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>63</td>
<td>2.20±0.10</td>
<td>10.15±0.24a</td>
</tr>
<tr>
<td>Twin</td>
<td>42</td>
<td>2.19±0.07</td>
<td>9.35±0.36b</td>
</tr>
<tr>
<td>Parity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First</td>
<td>16</td>
<td>2.21±0.10b</td>
<td>9.07±0.37b</td>
</tr>
<tr>
<td>Second</td>
<td>36</td>
<td>2.28 ±0.07b</td>
<td>9.81±0.26b</td>
</tr>
<tr>
<td>Third</td>
<td>28</td>
<td>2.35 ±0.14a</td>
<td>10.37±0.53a</td>
</tr>
<tr>
<td>Fourth</td>
<td>14</td>
<td>2.34±0.08a</td>
<td>10.28±0.44a</td>
</tr>
<tr>
<td>Fifth</td>
<td>11</td>
<td>2.36±0.08a</td>
<td>10.41±0.54a</td>
</tr>
</tbody>
</table>

a,b Mean in the same column with different superscripts are significant (P < 0.05)
The effect of breed on growth of lambs from birth to weaning is shown in Figure 1. The growth rate of Yankasa lambs was faster compared to WAD and the crosses, while crosses had a better growth rate relative to WAD lambs which may be attributed to heterosis. The observed differences in the various breeds may be due more to the effect of gene rather than environmental factors.

A simple correlation between the BW and WW of lambs showed a positive correlation (0.719) which was significant (P < 0.01) across breeds. This was consistent with the observation of McFee (1985) showing selection can either be done at birth or weaning. Hanford et al. (2003) reported a correlation of 0.52 between BW and WW for Targhee sheep.

BW which itself is affected by dam size, dam body condition and litter size, influences the survival rate and pre-weaning growth performance of offsprings (Laes-Fettk and Peters, 1995).

**CONCLUSION**

The results of the study showed that the differences in factors influencing birth and weaning weight at early phases might have risen from the variation among breeds and some factors observed in this study. Animal performance records should therefore be adjusted to reduce known differences between animals so that genetic differences among animals can be recognized and used for effective breeding plan for their improvement. Based on the observed differences in the breed, It was concluded that Yankasa breed of sheep had a better performance and it will be recommended that flocks of West African Dwarf sheep should be cross bred with Yankasa sheep so as to take advantage of heterosis for better productivity in improving the growth rate of the breed.

**REFERENCES**


Mandal A., Nesser F.W.C., Rout P.K., Roy R., Notter D.R. 2006. Genetic parameters for direct and maternal effects on body weights of Muzaffarnagari kids. Journal of...
FACTORS AFFECTING BIRTH AND WEANING WEIGHTS IN LAMBS OF...


(Manuscript received: 29th January, 2013; accepted: 14th June 2013).