Body Weight and Body Measurements in Santa Inês Crossbred Sheep

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The objective of this study was to evaluate the relationship of body weight with different body measurements in Santa Inês Crossbred Sheep. The data from a total of 399 animals, males and non-pregnant females, one to 48 months of age from the Sheep Unit, Institut Veterinar Malaysia, were used in this study. Animals were divided into six live body weight categories (A; 1-10, B; 11-20, C; 21-30, D; 31-40, E; 41-50 and F; 51-60 kg). Overall mean (±SEM) values of four body measurements, body weight (BW, kg); heart girth(HG, cm); wither height (WH, cm) and body length (BL, cm) were 8.7 ± 0.2, 14.0 ± 0.3, 25.8 ± 0.2, 34.6 ± 0.3, 44.3 ± 0.6, 53.6 ± 1.3 kg; 47.2 ± 0.4, 55.8 ± 0.6, 70.0 ± 0.4, 77.3 ± 0.5, 83.3 ± 0.9 cm; 89.0 ±1.3; 17.3 ± 0.3, 19.8 ± 0.2, 24.7 ± 0.5, 25.4 ± 0.2, 25.8 ± 0.4, 29.0 ± 2.1 cm and 46.0 ± 0.6, 52.7 ± 0.7, 63.9 ± 0.5, 70.0 ± 0.9, 69.6 ± 3.0, 71.6 ± 1.0 cm in all body weight categories respectively. The mean HG measurement was significantly different (p<0.05) in all body weight categories. A highly positive correlation coefficient (r=0.946) was established between BW and HG (p<0.01), but moderately correlated with BL (r=0.778) and WH (r=0.669), indicating relationships of association between variables measured. Similar situation were observed in male and female animals. It is concluded that body weight could be estimated by using heart girth measurement for Santa Inês Crossbred Sheep.

Keywords: Santa Inês Crossbred Sheep, body weight, body measurements

Introduction

The pure bred Santa Inês is a Brazilian breed of hair sheep. They are reared for their meat. Their colours range from red, black and white and can be spotted or solid. They have large bodies, are long-legged, have large pendulous ears and are polled. This breed has proven to be an excellent alternative to increase the production of sheep meat due to its good reproductive efficiency and growth rate. The Malaysian Santa Inês hair sheep was imported from Brazil in 1992. No new pure blood was introduced since then, the animals were allowed to be crossbreed with other smaller hair sheep breeds such as Brabados Black Belly and Damara. Information on body weight with several body measurements, such as body weight, heart girth, wither height and body length are not only used to monitor the growth of the sheep but also to estimate genetic correlation between body weight and body measurements (Mahmood et al., 2012). Body measurements have been used in determination of adult size, nutritional requirements and physiological maturity and economic values of the animal (Morais and Madalena, 2006). Measurement of various body conformations are also useful and provides great convenience for the prediction of body weight without weighting scales in the field (Mahmood et al., 2012; Salleh et al., 2011). Different models might be needed to predict body weight in different geographical conditions and breeds. The aim of this
study was to evaluate the relationship of body weight with different body measurements in Malaysian Santa Inês Crossbred Sheep.

Materials and Methods

A random sample from 399 Santa Inês crossbreds, males and non-pregnant females, one to 48 months of age from the Sheep Unit, Institut Veterinar Malaysia, were used in this study. The animals were managed semi intensively, fed on grass and sheep pellet. The body weight (BW) of the animals were recorded using hanging scales. The body measurements for heart girth (HG), wither height (WH) and body length (BL) were recorded using tailor’s tape. Withers height (WH) was measured as the distance from the platform to the withers, Heart girth (HG) was measured just behind the scapula and Body length (BL) was measured as the distance between occipital joint to first caudal vertebra. Data were divided into six body weight categories 1-10 (n=73), 11-20 (n=93), 21-30 (n=131), 31-40 (n=81), 41-50 (n=16) and 51-60 (n=5) kg. SPSS (ver. 17) was used for statistical analyses. The differences in mean body measurements were analysed using one way ANOVA and relationships between body measurements were calculated by Pearson correlations and regression equations in all body weight categories.

Results

Table 1 show the body measurements of sheep in different body weight categories. Overall mean (±SEM) values of four body measurements, body weight (BW); heart girth (HG); wither height (WH) and body length (BL) were 8.7 ± 0.2, 14.0 ± 0.3, 25.8 ± 0.2, 34.6 ± 0.3, 44.3 ± 0.6, 53.6 ± 1.3; 47.2 ± 0.4, 55.8 ± 0.6, 70.0 ± 0.4, 77.3 ± 0.5, 83.3 ± 0.9, 89.0 ± 1.3 cm; 17.3 ± 0.3, 19.8 ± 0.2, 24.7 ± 0.5, 25.4 ± 0.2, 25.8 ± 0.4, 29.0 ± 2.1 cm and 46.0 ± 0.6, 52.7 ± 0.7, 63.9 ± 0.5, 70.0 ± 0.9, 69.6 ± 3.0, 71.6 ± 1.0 cm in all body weight categories respectively. The mean HG measurement was significantly different (p<0.05) in all body weight categories.

Table 1. Body measurements (mean ± SEM) of Santa Inês crossbreds in different body weight categories.

<table>
<thead>
<tr>
<th>Body Measurement</th>
<th>Body Weight Categories (kg)</th>
<th>A 1-10</th>
<th>B 11-20</th>
<th>C 21-30</th>
<th>D 31-40</th>
<th>E 41-50</th>
<th>F 51-60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body weight (kg)</td>
<td>8.7 ± 0.2^a</td>
<td>14.0 ± 0.3^b</td>
<td>25.8 ± 0.2^c</td>
<td>34.6 ± 0.3^d</td>
<td>44.3 ± 0.6^e</td>
<td>53.6 ± 1.3^f</td>
<td></td>
</tr>
<tr>
<td>Heart girth (cm)</td>
<td>47.2 ± 0.4^a</td>
<td>55.8 ± 0.6^b</td>
<td>70.0 ± 0.4^c</td>
<td>77.3 ± 0.5^d</td>
<td>83.3 ± 0.9^e</td>
<td>89.0 ± 1.3^f</td>
<td></td>
</tr>
<tr>
<td>Wither height (cm)</td>
<td>17.3 ± 0.3^a</td>
<td>19.8 ± 0.2^b</td>
<td>24.7 ± 0.5^c</td>
<td>25.4 ± 0.2^b</td>
<td>25.8 ± 0.4^c</td>
<td>29.0 ± 2.1^d</td>
<td></td>
</tr>
<tr>
<td>Body length (cm)</td>
<td>46.0 ± 0.6^a</td>
<td>52.7 ± 0.7^b</td>
<td>63.9 ± 0.5^c</td>
<td>70.0 ± 0.9^d</td>
<td>69.6 ± 3.0^d</td>
<td>71.6 ± 1.0^d</td>
<td></td>
</tr>
</tbody>
</table>

* means within a row with different superscripts a,b,c,d,e,f are significantly different at (P<0.05) level
The correlation coefficient between body weight and body measurements (BL, HG, WH and BL) are summarised in Table 2. A highly positive correlation coefficient (r=0.946) was established between BW and HG (p<0.01), but moderately correlated with BL (r=0.778) and WH (r=0.669), indicating relationships of association between variables measured. A similar situation was observed in male and female animals.

Table 2. Correlation coefficient for body measurements in Santa Inês crossbred.

<table>
<thead>
<tr>
<th></th>
<th>Body weight</th>
<th>Heart girth</th>
<th>Wither height</th>
<th>Body length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body weight</td>
<td>1</td>
<td>0.946**</td>
<td>0.669**</td>
<td>0.778**</td>
</tr>
</tbody>
</table>

**Correlation is significant at the 0.01 level(2-tailed)

Discussion

In this study the high correlation between body weight and heart girth suggested that body weight could be predicted precisely from hearth girth in Santa Inês sheep as in west African, Pakistan indigenous, Turkey Karya sheep (Sowande and Sobolo, 2008; Mohammad et al., 2012; Yilma et al., 2012) and Boer and Shami goats (Javanmard et al., 2008; Salleh et al., 2012). Similar to what was observed in the present study, Koritiaki et al, 2012 working with Santa Ines lambs in the period from birth to 154 days of age, observed isometric growth in heart girth and weight, indicating that the growth of these two characteristics were similar. Nato et al., 2012 found different growth rates for body measurements, with wither height being that stabilised earliest and hearth girth as that which keep growing longest. Koritiaki et al, 2012 also indicated that the height had slower development than weight, the length had more rapid development than the weight, this explained the moderate relationship between body weight with wither height and body length obtained in this study. It is concluded that body weight could be estimated by using heart girth measurements for Santa Inês Crossbred Sheep.

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References


