CORRECTION FACTORS ADJUSTING SIX MONTH WEIGHT
FOR AGE OF DAM AT LAMBING IN SHEEP

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ABSTRACT

Data on 751 lambs pertaining to synthetic population developed by inter se mating of half bred of Corriedale and Russian Merino rams with Nali ewes were used to developed Additive Correction Factors (ACF) and Multiplicative Correction Factors (MCF) for age of dam at lambing. The mathematical model for least squares analysis for deriving correction factors for age of dam at lambing also included the fixed effects of year, season of lambing, sex of lamb and Dam's weight at lambing as covariate. On the basis of CV both ACF and MCF were equally effective. However, the comparison of age correction factors on the basis of means squares among age group, ACF was found to be more effective. The phenotypic correlation between ages at lambing with corrected body weight increased over the uncorrected values. It showed that both the methods were equally effective.

Better growth is essential for production, reproduction and survivability in sheep. Six month body weight reflects actual genetic potential for growth and production. Beside genetic merit, it is influenced by non-genetic factors like year, season, sex, age of dam and dam’s body weight at lambing etc. The adjustment of six month body weight for these effects is necessary to obtain the accurate estimates of breeding value of lambs. The present investigation describes dam’s age correction factors for six month body weight by additive and multiplicative correction methods and tests their efficiency.

The data on 751 lambs pertaining to synthetic population (developed by inter se mating of half breeds of Corriedale and Russian Merino rams with Nali ewes) maintained under the research scheme at CCS Haryana Agricultural University, Hisar for the period from 1986 to 1996 were utilized to carry out the present investigation. Lambs are allowed to suckle their mother up to 90 days twice daily and thereafter weaned. Sucking lambs were also fed concentrate mixture up to weaning and allowed to graze separately from their mother. The data were adjusted for the effect of year, season of lambing, sex and partial regression of dam’s weight at lambing. For studying the effect of age of dam at lambing data were classified into seven dam’s age group classes. The correction factors were obtained as per methods used by Aziz et al., 1989, Aziz et al.,1993 and Mehar, 1994.

The criteria used to compare two types of correction factors were means, coefficient of variation (CV) within adjusted sub-class, reduction in mean squares among age group, phenotypic correlation between ages of dam’s at lambing with corrected six month body weight.

The least squares analysis indicated the significant effect of age group of dam on six month weight; hence the correction factors were developed, which are presented in Table 1. The value of additive correction factors for six month weight was maximum (+0.86) in the age group of 49 to 60 months, while it was minimum (-0.67) in the <24 months age group. Age group wise additive correction factors showed increasing trend up to 49 to 60 months age, thereafter decreasing trend with the increasing of age.

The value of MCF for six month

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Table 1. Correction factor of age of dam for six month weight

<table>
<thead>
<tr>
<th>Age groups (months)</th>
<th>Number of observation</th>
<th>Six months weight ACF</th>
<th>MCF</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;24</td>
<td>31</td>
<td>-0.67</td>
<td>1.05</td>
</tr>
<tr>
<td>25 to 36</td>
<td>132</td>
<td>+0.43</td>
<td>0.97</td>
</tr>
<tr>
<td>37 to 48</td>
<td>136</td>
<td>+0.43</td>
<td>0.97</td>
</tr>
<tr>
<td>49 to 60</td>
<td>112</td>
<td>+0.86</td>
<td>0.94</td>
</tr>
<tr>
<td>61 to 72</td>
<td>129</td>
<td>-0.04</td>
<td>1.00</td>
</tr>
<tr>
<td>73 to 84</td>
<td>141</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>&gt;84</td>
<td>70</td>
<td>-0.06</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Table 2. Least squares means and coefficient of variation (CV) of actual, additively and multiplicatively corrected six month weights for different age groups

<table>
<thead>
<tr>
<th>Age groups (months)</th>
<th>N</th>
<th>Actual</th>
<th>CV %</th>
<th>Additively corrected</th>
<th>CV %</th>
<th>Multiplicatively corrected</th>
<th>CV %</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;24</td>
<td>31</td>
<td>12.60</td>
<td>23.86</td>
<td>13.26</td>
<td>22.68</td>
<td>13.12</td>
<td>22.49</td>
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<tr>
<td>25 to 36</td>
<td>132</td>
<td>13.70</td>
<td>29.15</td>
<td>13.27</td>
<td>30.38</td>
<td>13.29</td>
<td>29.39</td>
</tr>
<tr>
<td>37 to 48</td>
<td>136</td>
<td>13.71</td>
<td>28.92</td>
<td>13.27</td>
<td>29.88</td>
<td>13.29</td>
<td>29.83</td>
</tr>
<tr>
<td>49 to 60</td>
<td>112</td>
<td>14.13</td>
<td>26.96</td>
<td>13.27</td>
<td>28.71</td>
<td>13.28</td>
<td>28.89</td>
</tr>
<tr>
<td>61 to 72</td>
<td>129</td>
<td>13.24</td>
<td>29.17</td>
<td>13.28</td>
<td>29.07</td>
<td>13.34</td>
<td>29.17</td>
</tr>
<tr>
<td>73 to 84</td>
<td>141</td>
<td>13.27</td>
<td>29.53</td>
<td>13.27</td>
<td>29.53</td>
<td>13.27</td>
<td>29.53</td>
</tr>
<tr>
<td>&gt;84</td>
<td>70</td>
<td>13.21</td>
<td>26.60</td>
<td>13.27</td>
<td>26.48</td>
<td>13.20</td>
<td>25.99</td>
</tr>
</tbody>
</table>

N= Number of observations.

weight was highest (1.05) in the age group of, <24 months, where as it was lowest (0.94) in the age group of 49 to 60 month of age. Age group wise MCF showed decreasing trend up to 49 to 60 months of age, thereafter increasing trend with the increasing of age.

The Table 2 indicated that uncorrected six month weight 14.13 kg was the highest for the ewe lambing 49 to 60 months of age group. There was an increasing trend in six month weight of lambs with the advancement of age of dam up to 60 months, after 60 months there was decrease trend in six month weight. The six month weights corrected for age of dam by ACF and MCF were almost similar in all age groups. The six month weight corrected for age of dam by MCF were more or less comparable to each other with the difference of 0.17 kg between the maximum (25 to 36 and 37 to 48 months) and minimum (< 24 months) age group. The six month weight corrected for ACF and MCF is comparable indicating that both methods are effective. Since ACF retained constant least square means, it could be regarded of most efficient method on this basis. Similar results were reported by Aziz et al., 1989, and Elkje and Johnson, 1985, where as Aziz et al., 1993 and Mehar, 1994 recommended the use of multiplicative correction factors.

It is evident from the results that coefficient of variation for age of dam by two methods were comparable. The coefficients of variation of actual and corrected six month weight by ACF and MCF for age of dam were 29.53 per cent for the base class (73 to 84 months). On the basis of this criterion ACF and MCF are equally effective.

The mean squares for six month weight for the effect of age of dam reduced from 14.887 to 0.001 and 0.168 respectively in ACF and MCF. The reduction was observed more in ACF than MCF hence the ACF was more appropriate. Similar results were reported by Mehar, 1994 where as Aziz et al., 1989 suggested MCF.
The phenotypic correlations of age at lambing with actual six month weight were 0.003. The phenotypic correlations of age at lambing with ACF and MCF corrected weaning weight were 0.045 and 0.04 respectively. The phenotypic correlation does not appear any significant differences between these two methods and both methods were almost equally effective.

REFERENCES