ABSTRACT

Name	:	**Maroof Ahmad**	**Id. No.**	:	**24694**
Semester & year of admission	:	**Ist, 1999-2000**	**Degree**	:	**Ph. D.**
Major	:	**Animal Breeding**	**Department**	:	**Animal Science**
Minor	:	**Molecular Biology & Biotechnology**			

Thesis title : "GENETIC EVALUATION OF GROWTH AND WOOL YIELD TRAITS USING ANIMAL MODEL IN AVIKALIN CROSSBRED SHEEP"

Advisor : Dr. C V Singh

Data consisting of 1313 lambs records of Avikalin sheep, maintained at CSWRI, Avikanagar, Rajasthan over the period 1980-2001, were used for present study. The traits studied were BWT, WWT, WT6, WT12 and GFY1. The data were subject to LSMLMW and MIXMDL package of Harvey (1990) and derivative free REML package of Mayer (1990). Same model taking sex and season of lamb as fixed effect and sire as random effect.

The least squares means ±s.e. of BWT, WWT, WT6, WT12, and GFY1 were 2.91 ± 0.045 kg, 15.57 ± 0.184 kg, 20.98 ± 0.249 kg, 26.13 ± 0.304 kg and 1.06 ± 0.018 kg, respectively, under model 2 and 2.89 ± 0.051 kg, 15.58 ± 0.152 kg, 20.86 ± 0.196 kg, 26.03 ± 0.228 kg, and 1.06 ± 0.014 kg respectively, under model 8. Least squares means estimated by model 8 were slightly lower than the means estimated by model 2. The C.V. were slightly lower in model 8 than the univariate for all the traits.

The random effect of sire had highly significant ($P<0.01$) effect on all the traits under model 2. The sire had accounted more variation under model 2 than model 8 for all the traits. The coefficient of multiple determination (R^2) obtained under model 8 were 13.50, 13.90, 26.40, 33.30 and 12.10 per cent, respectively, for BWT, WWT, WT6, WT12 and GFY1. The fixed effect of season of lambing had highly significant ($P<0.01$) on BWT, WT6 and WT12 under model 2 and 8. However, non-significant differences were found for WWT and GFY1 under model 2 and 8. The differences in body weight at, birth, weaning, 6 month, 12 month and GFY1 due to sex was highly significant ($P<0.01$) under model 2 and 8. Male lambs were significantly heavier at all the ages and produced more wool yield than the female lambs.

The heritability estimated under model 2, model 8 and univariate REML analysis were 0.203, 0.197 and 0.265, respectively for birth weight, 0.229, 0.227 and 0.138, respectively for weaning weigh; 0.312, 0.319 and 0.188, respectively for WT6; 0.319, 0.397 and 0.243 respectively for WT12; and 0.373, 0.374 and 0.140 respectively for GFY1. Model 2 and model 8 had higher estimates of h^2 than the univariate REML procedure. The genetic, phenotypic and environmental correlations among all the traits under study were observed positive and from moderate to very high. In general, the genetic correlations tend to be slightly higher than their phenotypic counter parts in all the traits. Under BLUP1, the percentage of superior sires to the population mean was 50 per cent or less than 50 per cent for the traits studied. Corresponding values were above 55 per cent under BLUP 2. The superiority of the best sire (as per cent of raw mean) was higher in BLUP 2 than the BLUP 1 for all the traits. It was also observed that range of sire effects was more under BLUP 2, therefore, univariate REML an animal model could be used for sire evaluation. The rank correlations for BWT, WWT, WT6, WT12 and GFY1 under model 8 and univariate animal model were highly significant.

(C V Singh)
Advisor

(Maroof Ahmad)
Author