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Bayesian Analyses of Growth Traits in Mecheri Sheep Reared under Tropical Climatic Conditions of India

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Abstract

The objective of this study was to estimate (co) variance components and genetic parameters for body weights at different ages in Mecheri sheep born during the period from 2010 to 2020 (11 years). A total of 2825 lambs with pedigree descended from 758 dams and 119 sires were included in this study. Bayesian analysis using Gibbs sampler multi-trait animal model with direct and maternal effects were studied. Traits included in this study were birth weight (BW), weaning weight (WW), six months body weight (BW6), nine months body weight (BW9), Yearling weight (BW12). The least-squares means with standard deviation for body weight at birth, weaning and 12-months of age were 2.57 ± 0.44 , 11.09 ± 2.54 and 20.67 ± 4.04 kg respectively. Analysis of variance indicated that fixed effects of year of birth, season of birth, type of birth, sex of the lamb and parity of the dam significantly affected the growth traits at different stages. The direct heritability estimates for BW, WW, BW6, BW9 and BW12 based on best model were 0.21, 0.21, 0.12, 0.14 and 0.13, respectively and the corresponding maternal heritability estimates were 0.18, 0.08, 0.11, 0.13 and 0.13, respectively. Strong and positive estimates of direct additive genetic correlations were observed in growth traits and they ranged from 0.165 (BW-BW12) to 0.904 (BW6-BW9). The findings of this study have underlined the importance of maternal effects in Mecheri sheep and their influence on growth traits. Significant genetic variability suggests further scope of selection for growth traits and a moderate rate of genetic progress seems possible in the Mecheri sheep flock for live weight traits by mass selection. The strong and positive estimates of genetic correlations between WW and BW6 indicated that improvement in one trait will bring improvements in other traits. Hence, better response to selection would be seen, if selection in Mecheri sheep for improvement of body weights followed at weaning age, than the current practice of selection at six months of age.

Keywords: Body weight, direct heritability, Gibbs sampling, Maternal effects Multi-trait animal model, Mecheri sheep

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