

Impact of selection on growth of Marwari lambs

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Received: 4 April 2008; Accepted: 4 August 2009

Key words: Body weight, Growth, Marwari, Selection

The Marwari breed of sheep is most populous, hardy and migratory breed of sheep (Acharya 1982). The wool produced by the Marwari sheep is good for carpet making (Sharma *et al.* 2000). The lambs are generally sold at the age of about 6 to 9 months on the basis of their live-weight for mutton (Mehta *et al.* 1995). Growth of lambs is therefore a very important criterion as it is positively correlated with wool production (Tekin *et al.* 1999) as well as mutton production.

Sheep, a seasonal breeder, has 2 breeding seasons in a year. The autumn is considered as major breeding season and the spring is considered as minor breeding season. Henceforth, the majority of lambing takes place in spring. Selection had been practiced in a flock of Marwari sheep maintained at the institute for improving the greasy fleece yield (GFY) and against medullation. In addition to selection, the breeding of ewes may be proponed or postponed to some extent depending on the requirement. Therefore, this study was carried out to see the effect of genetic group, month of lambing and sex of the lamb on the growth of Marwari sheep.

The Marwari sheep flock maintained at Central Sheep and Wool Research Institute, Arid Reason Campus, Bikaner, was utilized for the purpose. The data were analysed for the lambs born in four consecutive years. There were three genetic groups, viz. R-random mating group, G-group selected against medullation, H-group selected for greasy fleece yield. Entire spring lambing season encompassing, January (M₁), February (M₂) and March (M₃) month was covered.

Analysis of variance was carried out to test the effect of genetic group, month and their interaction on the growth of lambs. Duncan's multiple range test was used to compare the means of different classes (Snedecor and Cochran 1967).

The birth, 3, 6, 9 and 12 months' body weight of lambs,

pooled over sex ranged from 2.493 to 2.705, 9.893 to 11.397, 14.804 to 16.717, 17.875 to 19.908 and 18.750 to 22.143 kg respectively, in different genetic groups and months of lambing (Table 1). The present body weights are quite consistent with the one reported by Sahani *et al.* (2005) in Marwari lambs. However, slightly higher body weights from birth to 12 months' age have been reported in Marwari sheep by Dass and Singh (2003).

Effect of selection: The effect of selection for increasing greasy fleece yield (H) and decreasing medullation (G) was non-significant ($P>0.05$) on growth of lambs. All possible interactions of genetic group with month and sex were also non-significant. Positive correlation among body weight and greasy fleece weight has been reported (Tekin *et al.* 1999) but in present investigation significantly different growth of lambs was not observed among the three genetic groups.

Effect of month: The effect of month of birth of the lamb was significant ($P<0.05$) on the body weight of lambs at birth, three and nine months' age, and highly significant ($P<0.01$) at twelve months' age. At birth, the lambs born in the month of February (M₂) were heavier than others but the mean comparison showed non-significant differences among the lambs born in the three (M₁ M₂, M₃) months. At three month's age the lambs born during January (M₁) were significantly ($P<0.05$) heavier than the lambs born in February (M₂) and March (M₃). At nine months' age the lambs born in the month of January (M₁) and February (M₂) were significantly ($P<0.05$) heavier than those born in the month of March (M₃). The effect of month was highly significant ($P<0.01$) on body weight of lambs at twelve months' age. The mean comparison revealed similar picture to that observed at nine months' age. The present results clearly indicate that the lambs born out of breeding during early phase of breeding season were heavier than those born out of mating that took place relatively late during the breeding season. Same trend in the body weight was observed in the Indian Karakul sheep reared under the similar conditions but with relatively higher body weights (Sahani *et al.* 2009). Therefore, breeding should be scheduled in a manner to concentrate lambing in January (M₁) and February (M₂).

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Table 1. Month, genetic group and sex wise body weight (kg) of Mawari lambs

		Birth weight	Three months' weight	Six months' weight	Nine months' weight	Twelve months' weight
R-group						
January	M	2.463±0.118(16)	11.457±0.539(14)	15.991±1.108(11)	19.650±0.847(10)	21.000±1.392(9)
	F	2.630±0.095(17)	11.107±0.479(15)	15.508±0.663(13)	18.454±0.440(13)	21.038±0.642(13)
February	M	2.687±0.055(32)	10.537±0.313(19)	14.750±0.745(16)	20.700±0.935(14)	22.682±1.244(11)
	F	2.545±0.064(41)	10.339±0.338(33)	14.838±0.455(26)	18.877±0.480(26)	20.591±0.590(22)
March	M	2.629±0.189(7)	11.100±0.828(5)	17.400±0.332(5)	19.875±0.125(4)	19.333±0.601(3)
	F	2.733±0.145(3)	11.750±0.250(2)	13.300±0.00(1)	17.750±0.250(2)	19.250±0.250(2)
G-group						
January	M	2.563±0.088(23)	12.063±0.487(19)	17.030±0.940(13)	21.155±1.069(11)	24.125±1.375(8)
	F	2.579±0.077(26)	10.765±0.186(20)	13.914±0.478(21)	18.597±0.757(20)	20.567±0.671(18)
February	M	2.768±0.036(123)	10.711±0.215(91)	16.464±0.309(59)	21.614±0.514(56)	22.819±0.481(47)
	F	2.640±0.034(134)	10.334±0.155(112)	14.553±0.235(94)	18.537±0.297(90)	20.402±0.293(82)
March	M	2.764±0.078(22)	10.380±0.415(20)	15.727±0.715(11)	18.000±0.958(11)	18.417±0.944(6)
	F	2.516±0.107(19)	11.218±0.486(17)	16.140±0.644(15)	17.867±0.701(15)	18.893±0.734(14)
H-group						
January	M	2.537±0.123(12)	11.418±0.688(11)	16.133±0.916(9)	20.500±1.077(9)	21.222±0.566(9)
	F	2.440±0.092(10)	10.756±0.321(9)	13.750±0.829(8)	18.200±0.784(8)	19.750±0.947(6)
February	M	2.821±0.080(35)	11.470±0.526(27)	16.723±0.576(22)	21.595±0.739(19)	23.132±0.677(19)
	F	2.570±0.082(30)	10.435±0.385(23)	15.194±0.614(18)	18.128±0.480(18)	20.969±0.613(16)
March	M	2.489±0.225(9)	10.163±0.956(8)	14.800±1.991(5)	16.800±2.183(5)	19.333±2.028(3)
	F	2.638±0.107(8)	9.533±0.745(6)	16.250±0.595(4)	19.667±0.167(3)	18.500±1.323(3)
Pooled over genetic groups						
January	M	2.526(51)	11.709(44)	16.439(33)	20.457(30)	22.038(26)
	F	2.569(53)	10.879(44)	14.376(42)	18.471(41)	20.60(37)
February	M	2.764(190)	10.836(137)	16.240(97)	21.466(89)	22.877(77)
	F	2.611(205)	10.349(168)	14.690(138)	18.548(134)	20.512(120)
March	M	2.674(38)	10.436(33)	15.905(21)	18.075(20)	18.875(12)
	F	2.570 (30)	10.856 (25)	16.020 (20)	18.125 (20)	18.869 (19)

Effect of sex: The effect of sex on body weight of lambs was initially (birth and weaning) non-significant but after attaining marketing age (6 and 9 months) and subsequently, it was highly significant ($P<0.01$) except at twelve months' age where it was significant ($P<0.05$). The males were superior to females. Critical examination of the data indicated that the differences in the body weights among males and females were quit remarkable in first two months i.e. in January (M_1) and February (M_2). However, in the month of March (M_3) the body weights of males and females were hardly different. Dass and Singh (2003) reported highly significant ($P<0.01$) effect of sex on growth of lambs throughout the growth phase, which is in closed agreement with the present results.

SUMMARY

The growth of Marwari lambs was analysed to see the effect of selection for increasing greasy fleece yield and decreasing medullation and that of sex and month of lambing on the growth of lambs. The effect of selection for increasing

greasy fleece yield and decreasing medullation on growth was nonsignificant and males were significantly superior to females throughout the growth phase. The analysis of effect of month of lambing indicated significantly better growth in the lambs born in January and February. Therefore, breeding should be scheduled in a manner to concentrate lambing in January and February.

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