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## Factors influencing pre and post weaning body weights in Marwari sheep

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The Marwari breed of sheep constitutes the largest population of sheep (about 40%) in Rajasthan which has 14.31 million sheep (1997 Livestock Census, GOI). This breed is the main constituent of the migratory flocks in the state. Contribution of various factors on the body weights during the early stage of growth is of great significance in evaluating the performance of particular breed and for improving the productivity through selective breeding. Post weaning body weights, especially the 6-months weight, has direct bearing on the economics of the sheep owner as most of the surplus male are sold for mutton at this age (Mehta *et al.* 1995). The comparison of body weights of different groups of Marwari sheep and the factors influencing the body weights will be quite useful in improving the productivity of Marwari sheep.

Body weights at birth, weaning (90 days), 6-, 9- and 12-months of age were recorded in 217 spring born (February and March) Marwari lambs. The lambs comprised 3 groups, viz. the group selected for greasy fleece weight (G), the group selected against medullation (H) and the random mating group (R) with 143, 32 and 42 lambs respectively. All lambs belong to the carpet wool project of the Central Sheep and Wool Research Institute, Arid Region Campus, Bikaner. The lambs were weaned at the age of 90 days. The lambs were sent for 3 to 4 hr grazing initially during the 2nd and 3rd month of age in the near by paddock as a single flock. Later on the grazing hours were increased with advancement of age up to 6 hr a day. During peak summer (May and June) split grazing was adopted for 3 hr both in morning and evening. In addition to grazing, the lambs were supplemented with concentrate @ 250 g/lamb up to 1 year of age.

As the subclass numbers were unequal the data were analysed using method of weighted analysis (Federer and Zelen 1966). The group means were compared by using Duncan's multiple range test (1957).

Genetic group, month and sex- wise average body weights

at birth, weaning, 6-, 9- and 12-months of age are presented in Table 1. The average birth weight for the 3 groups R, H and G was  $2.74 \pm 0.052$ ,  $2.66 \pm 0.15$  and  $2.78 \pm 0.031$  kg respectively. The effect of genetic group, sex and month of lambing was nonsignificant but the interaction of month with sex was significant ( $P < 0.05$ ). This was probably due to the fact that February born males were heavier than their contemporary females and March born males and females. The weaning weight was  $10.98 \pm 0.252$ ,  $10.834 \pm 0.43$  and  $11.00 \pm 0.146$  kg, respectively, for R, H and G group. The genetic group, month and sex effect along with all possible interactions was nonsignificant.

The 6-months weight for R, H and G group was  $16.281 \pm 0.266$ ,  $16.37 \pm 0.557$  and  $15.87 \pm 0.217$  kg respectively. The effect of sex was significant ( $P < 0.01$ ) at this age and this significance was observed till 12 months of age. The male lambs had significantly higher body weights. The 9-months weight in 3 groups ranged from  $20.20 \pm 0.674$  kg in H group to  $20.55 \pm 0.413$  kg in R group. The February born lambs were significantly ( $P < 0.01$ ) heavier than that of the March born lambs. Sex effect was significant with over all superiority of males over females. However, the males and females born in March did not differ significantly in 9-months body weight. The interaction of month with sex was also significant ( $P < 0.01$ ) because of the significantly heavier February born males in the same pattern as was observed for birth weight (Table 1).

The 12-months body weight in 3 groups R, H and G was  $22.13 \pm 0.548$ ,  $21.43 \pm 0.621$  and  $21.49 \pm 0.333$  kg respectively. The effect of month and sex was observed to be significant. Lambs born during February had significantly ( $P < 0.01$ ) higher 12-months weight and males were significantly ( $P < 0.05$ ) heavier than females.

The results indicated nonsignificant effect of genetic group on growth, which was not expected because selection for greasy fleece weight for 7-8 years should have indirectly selected the group G for higher body weight also as the 2 are positively correlated (Arora *et al.* 1977, Singh *et al.* 1986). This clearly indicated that the selection differential should be increased by incorporation of some of the out bred males

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Table 1. Month, genetic group and sex wise body weights at birth, 3, 6, 9 and 12 months of age in Marwari sheep

Genetic group	Birth weight		Three month's weight		Six month's weight		Nine month's weight		Twelve month's weight	
	Male	Female	Male	Female	Male**	Female	Male**	Female	Male*	Female
Effect	NS		NS		NS		NS		NS	
R group										
February	2.82±0.07 (15)	2.76±0.08 (18)	10.93±0.48 (7)	11.88±0.33 (17)	16.83±0.72 (8)	15.79±0.31 (14)	22.63±1.22 (8)	19.96±0.44 (14)	24.92±1.83 (6)	21.92±0.50 (12)
March	2.63±0.19 (7)	2.75±0.25 (2)	11.10±0.83 (5)	11.75±0.25 (2)	17.40±0.33 (5)	13.30±0.00 (1)	19.88±0.13 (4)	17.75±0.25 (2)	19.33±0.60 (3)	19.25±0.20 (2)
H group										
February	2.80±0.11 (12)	2.59±0.13 (11)	11.17±1.13 (9)	10.17±0.55 (9)	17.13±0.71 (8)	15.38±1.09 (8)	24.44±1.08 (8)	17.75±0.90 (8)	23.50±0.95 (8)	20.86±0.91 (7)
March	2.38±0.26 (5)	2.80±0.08 (4)	11.980±0.43 (5)	10.25±0.52 (4)	17.17±2.46 (3)	16.25±0.60 (4)	18.67±3.28 (3)	19.67±0.17 (3)	19.50±3.50 (2)	18.50±1.32 (3)
G group										
February	2.86±0.05 (56)	2.76±0.05 (54)	11.35±0.28 (40)	10.53±0.21 (49)	17.00±0.35 (31)	14.89±0.32 (41)	23.93±0.62 (30)	19.10±0.57 (41)	24.36±0.65 (25)	20.99±0.50 (34)
March	2.68±0.09 (17)	2.63±0.09 (16)	10.97±0.39 (16)	11.63±0.42 (15)	16.00±0.73 (10)	16.14±0.64 (15)	18.10±1.05 (10)	17.87±0.70 (15)	18.42±0.94 (6)	18.89±0.73 (14)
Pooled										
February	2.86 (83)	2.73 (83)					23.62 (46)	19.12 (63)		
March	2.62 (29)	2.67 (22)					18.62 (17)	18.13 (20)		

R, Random group; H, group selected against medullation; G, group selected for greasy fleece weight; figures in parenthesis indicate number of observations; NS-nonsignificant ( $P>0.05$ ), \* ( $P<0.05$ ), \*\* ( $P<0.01$ ).

from field. The results do reflect the significant contribution of month of lambing within the spring on the pre and post weaning body weights under arid farm conditions. Thus efforts should be made to concentrate the lambing in early part of spring for better body weights.

#### SUMMARY

Body weights at birth, 6- and 12-months of age in 217 spring born Marwari lambs belonging to R, H and G groups were  $2.74\pm0.052$ ,  $2.66\pm0.15$ ,  $2.78\pm0.03$ ;  $16.281\pm0.266$ ,  $16.37\pm0.557$ ,  $15.87\pm0.217$  and  $22.13\pm0.548$ ,  $21.43\pm0.62$ ,  $21.49\pm0.333$  kg respectively. The effect of genetic group was nonsignificant. The effect of month of lambing was significant on pre and post weaning body weights. Hence, efforts should be made to concentrate the lambing in early part of the spring for better growth.

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