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Note on Genetic and Non-Genetic Factors Affecting Age and Body Weight at First Lambing in Patanwadi and its Halfbreds.

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Pre-weaning growth rate of the lambs is influenced by live body weight of the dam at first lambing. It is also known that early age at lambing is desired to reduce generation interval which inturn ensures high selection differential for rapid genetic improvement. Hence it was contemplated to study the genetic and non-genetic factors affecting age and body weight at first lambing.

The data on 347 lambs born during July, 1979 to September 1982 at All India Co-ordinated Research Project on sheep for fine wool, Dantiwada (Gujarat) were utilized for present study. The environmental temperature at the station ranged from 5°C to 27°C in winter and 25°C to 43°C in summer. The annual rainfall varied from 81 to 215 mm in different years, most of which precipitated during July to September. The animals were allowed 6 to 7 hours of grazing and were fed 200 g of concentrate ration in advanced stage of pregnancy and lactation. The sheep being the seasonal breeder, ewes were bred twice a year : (1) February to March and (ii) July to August, which are the two natural breeding seasons. Lambs were provided with colostrum from mother, immediately after birth and were kept together with mother for 3 days in lambing pen. All the lambs were reared under uniform conditions of management.

As the data were non-orthogonal because of unequal and disproportionate subclass frequencies, least squares methods of fitting constants was used for analysis of variance. Threeway classification model without interactions considering genetic groups, years and seasons as the main fixed effect was used. Modified DMRT was used for comparison of means. The estimates of genetic parameters were also obtained by paternal halfsib correlation method.

The average body weight at first lambing (BWFL) was 30.74 kg. The least squares means of weight at first lambing for Patanwadi (PP), Rambouillet x Patanwadi (RP) and Russian Merino x Patanwadi (MP) were 28.00, 31.78 and 31.56 kg. respectively. The genetic group difference were highly significant. The crossbreds were significantly heavier than native, but halfbred groups did not differ from each other. Such significant genetic group differences were also reported by Singh and Singh (1980) in Coimbatore and its crosses with Corriedale, by John (1981) in Nali and its crosses and by Subbarao (1981) in Chokla and its crosses with Rambouillet and Merino. Year of conception had no significant effect on body weight at first lambing. Arora (1983) had reported significant year effect and non-significant season

TABLE 1

Least squares means with standard error for age and weight at first lambing in Patanwadi and its halfbreds.

Particulars	*First Lambing*	
	Age (days)	*Weight (kg)*
Raw μ	1051.52 ± 16.39	30.74 ± 0.24
	(347, 29.03)	(347, 14.73)
Adjusted μ	1036.86 ± 13.98	30.45 ± 0.24
	(347, 25.12)	(347, 14.62)
GENETIC GROUPS		
Patanwadi	997.75 ± 25.89	28.00 ± 0 .44[a]
	(94, 25.16)	(94, 15.34)
Ramb. x Pat. (F_1)	1042.41 ± 20.37	31.78 ± 0.35[b]
	(149, 23.85)	(149, 13.40)
Merino x Pat. (F_1)	1070.42 ± 25.13	31.56 ± 0.43 [b]
	(104, 23.94)	(104, 13.90)
Years		
1981	748.49 ± 29.39[a]	30.20 ± 0.50[b]
	(75, 34.01)	(75, 14.43)
1982	1008.85 ± 26.02[b]	31.77 ± 0.45[a]
	(94.25.01)	(94, 13.61)
1983	1155.47 ± 26.25[c]	30.29 ± 0.45[b]
	(92, 21.79)	(92, 14.25)
1984	1234.62 ± 26.80[d]	29.54 ± 0.46[b]
	(86, 20.13)	(86, 14.41)
Seasons		
Spring	1027.61 ± 21.86	30.39 ± 0.37
	(131.24.34)	(131, 14.09)
Autumn	1046 ± 16.97	30.50 ± 0.29
	(216, 23.84)	(216, 14.02)

— Within parenthesis are number of observations and coefficient of variation.

— Similar superscript indicate no significant difference.

effect in Nellore, Mandya and their crosses with Dorset and Suffolk.

The average age at first lambing (AGFL) was 1051.52 days. The least squares mean were 998, 1042 and 1070 days for PP, RP and MP ewes respectively. The genetic group differences were non significant. Such non-significant effect of genetic groups was observed by Subbarao (1981) in Chokla and its crosses with Rambouillet and Merino. Year of conception had significant effect on this trait. Similar results were also obtained by Jain and Gupta (1986) in Nali, Chokla and their synthetics season of conception had non-significant effect on this trait.

The heritability estimates for AGFL and BWFL were low in PP but high in MP ewes. In case of RP ewes AGFL had high h^2 estimate but the same for BWFL were very near to zero. This indicated that the differences in half breds reared under identical conditions were due to differences in inheritance. Hence selection of individuals for early age at lambing will be effective.

Heritability estimates.

Breed group	AGFL	BWFL
Patanwadi	0.123 ± 0.269 (11, 7.88)	0.061 ± 0.242 (11, 7.88)
Ramb. x Pat.	0.610 ± 0.389 (12, 11.64)	-0.048 ± 0.121 (12, 11.64)
Merino x Pat.	0.908 ± 0.602 (11, 7.92)	0.668 ± 0.500 (11, 7.92)

Figure in parenthesis are number of sires and number of observations per sire.

Genetic correlation between these two traits was 0.181 ± 0.482 in MP halfbreds, while it was beyond limits in other two groups. The phenotypic correlations between these traits were 0.081 ± 0.108 in PP, 0.330 ± 0.080 in RP and 0.241 ± 0.103 in MP ewes. These estimates were low to moderate and positive, indicative of increased body weight at enhanced age at first lambing.

The results of present study indicated that Patanwadi had significantly lower weight and low age at first lambing.

This is indicative of good adaptability of native breed in the given environment. The non-significant difference within halfbred groups was indicative of good combining ability of Patanwadi with both exotic breeds.

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