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R Selvakkumar

Assistant Professor and Head,
Veterinary University Training
and Research Centre Nagercoil,
Kanyakumari, Tamil Nadu,
India

Effect of non-genetic factors on birth weight and growth performance of Vembur sheep maintained under semi intensive system of rearing

R Selvakkumar**Abstract**

The study was conducted with an objective to assess the effect of nongenetic factors like sex and season of birth on birth weight, weaning weight and growth performance in Vembur sheep breed. Data on season of birth and sex of lambs born between 2010 to 2014 (5 years) were analyzed. From the results, it was found that the season of birth has significant influence ($P < 0.05$) on birth weight and the lambs born during season 1 (December – April) had a higher body weight than the lambs born during season 2 (September – November). Weaning weight, pre-weaning average daily weight gain and body weight at 12 months of age in lambs born during season 1 (December – April) were higher than the lambs born during season 2 (September – November). Similarly, sex of the lambs also had a significant ($P < 0.05$) influence on birth weight, post weaning average daily weight gain, overall average daily weight gain and body weight at 12 months of age and male had a higher value irrespective of the season of birth.

Keywords: Growth performance, season of birth, sex, Tamil Nadu, Vembur sheep

Introduction

Birth weight is one of the most important traits that determines growth, production and reproduction traits in small ruminants. The animals weighing heavier at birth and weaning have a better survivability and may grow faster and likely to increase overall productivity. The birth weight and growth performance of sheep affected by genetic and non-genetic factors. We can get the genetic merits by appropriate selection and overcome the non-genetic factors by cautious management practices. Many non-genetic factors influence the phenotypic expression of the growth, reproduction and production of sheep^[1]. Weight of lamb at birth, weaning and pre-weaning weight gains are important components of overall flock productivity because of its association with weight at sale^[2]. The productive and reproductive performance of sheep flock depends on the availability of green fodder in the grazing area, which depends on the climatic and monsoon condition in the particular area in a particular period. Therefore, an attempt was made in the present study to investigate the influence of season of birth and sex on birth weight and growth performance of Vembur sheep reared under semi intensive system in Tamil Nadu state.

Materials and Methods

The data on birth weight, weaning weight and post weaning weight of Vembur lambs born at Instructional Livestock Farm Complex, Veterinary College and Research Institute, Tirunelveli, Tamil Nadu over the period of 5 years from 2010 to 2014 were utilized for this study. The period of birth was divided into two lambing seasons i.e. season 1 (December – April) and season 2 (September – November). The data pertained to 319 lambs born during the above period were subjected to least-square analysis and the effects of season of birth and sex were considered as potential source of variation.

Results and Discussion

The least-square means of birth weight, pre weaning and post weaning average body weight gain of Vembur sheep are presented in Table 1. The sex of the lamb had highly significant ($P < 0.01$) effect on birth weight. The average birth weight was 2.72 ± 0.04 kg and 2.58 ± 0.04 kg respectively for male and female born during season 1 and 2.87 ± 0.02 kg and ± 0.03 kg respectively for male and female lambs born during season 2.

Corresponding Author:**R Selvakkumar**

Assistant Professor and Head,
Veterinary University Training
and Research Centre Nagercoil,
Kanyakumari, Tamil Nadu,
India

The male lambs had higher birth weight than females irrespective of the season. The possible reason for this is that male fetus grows heavier in their prenatal development. Viroji Rao *et al.* [3], Sivaku mar *et al.* [4] and Thiruvankadan *et al.* [5] have also recorded a higher birth weights in male than female lambs in different sheep breeds. Similarly, significant difference was found in pre weaning average weight gain and weaning weight between the lambs born during season 1 ($P < 0.05$) and season 2. The ewes lambled during season 2 got pregnant during monsoon season and during that time the availability of pasture in the grazing land was abundant which might have contributed to higher birth weight at birth. Similar findings were also recorded by Ramesh Saravanakumar *et al.* [6] in Mecheri sheep. In contrary to the present findings, Balasubramanyam and Kumarasamy [7] reported that the season of birth had no influence on the birth weight of Madras

Red lambs.

Weaning weight and pre weaning average daily weight gain were differ between the season of birth and the lambs born during season 1 were having higher value ($P < 0.05$) however, the sex of the lambs has no effect on the above traits. Similarly, season of birth did not influence on post weaning and overall average daily weight gain. Devendran *et al.* [8] reported that the sex of the lambs and season of the birth had no influence on the pre weaning average daily weight gain. Although, the sex of the lambs had a highly significant influence ($P < 0.01$) on the post weaning average daily weight gain and overall average body weight gain irrespective of the season of birth. Similar findings were also reported by Sivakumar *et al.* [9] in Madras Red sheep under field condition. The overall average daily weight gain differed highly significantly ($P < 0.01$) between sex in both the season.

Table 1: Mean \pm SE of birth weight (kg), weaning weight (kg) and Average Daily Weight Gain (kg) in lambs born during different seasons

	Birth weight(kg)		P value	Significance	Weaning weight (kg)		P value	Significance	Average daily weight gain (gms) (Pre weaning)		P value	Significance	12-month body weight		P value	Significance	Average daily weight gain (kg) (Post weaning)		P value	Significance	Average daily weight gain (kg) (Overall)		P value	Significance
	Male	Female			Male	Female			Male	Female			Male	Female			Male	Female			Male	Female		
	Season 1	2.72 \pm 0.04 (59)	2.58 \pm 0.04 (47)	0.023	*	9.65 \pm 0.30 (46)	9.75 \pm 0.24 (40)	0.81	NS	0.077 \pm 0.00 (46)	0.079 \pm 0.00 (40)	0.56	NS	22.59 \pm 0.40 (14)	19.44 \pm 0.41 (23)	0.000	**	0.048 \pm 0.00 (14)	0.035 \pm 0.00 (23)	0.000	**	0.054 \pm 0.00 (14)	0.044 \pm 0.00 (23)	0.00
Season 2	2.87 \pm 0.02 (130)	2.67 \pm 0.03 (83)	0.00	**	8.79 \pm 0.22 (87)	8.57 \pm 0.22 (81)	0.459	NS	0.067 \pm 0.00 (87)	0.065 \pm 0.00 (81)	0.73	NS	21.62 \pm 0.23 (44)	18.58 \pm 0.14 (74)	0.000	**	0.048 \pm 0.00 (44)	0.038 \pm 0.00 (74)	0.000	**	0.052 \pm 0.00 (44)	0.044 \pm 0.00 (74)	0.00	**
P Value	0.001	0.048			0.025	0.001			0.018	0.001			0.046	0.020			0.094	0.113			0.107	0.39		
Significance	**	*			*	**			*	**			*	*			NS	NS			NS	NS		

** $P < 0.01$; * $P < 0.05$; NS– Not significant, Figures in the parenthesis indicate the number of observations.

Conclusion

From this study it was concluded that the season of birth and sex of the lambs had an influence on birth weight of Vembur lambs and the pre and post weaning average daily body weight gain were influenced by the season of birth and sex of the lambs.

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