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## Pre-weaning growth performance in deccani sheep

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### Abstract

The present investigation was undertaken to evaluate the effect of genetic and non-genetic factors on pre-weaning growth traits in Deccani flock comprising records of 300 animals maintained at Livestock Research Station, Mahabubnagar, Telangana State from October, 2012 to July, 2015. The least squares means for body weight were  $2.72 \pm 0.03$ ,  $4.37 \pm 0.07$ ,  $5.90 \pm 0.10$ ,  $7.49 \pm 0.12$ ,  $9.03 \pm 0.14$ ,  $10.32 \pm 0.15$  and  $11.48 \pm 0.16$  kg at birth, 15, 30, 45, 60, 75 and 90 days of age, respectively. The least-squares analysis of variance revealed highly significant influence of sex on birth weight ( $P \leq 0.05$ ); season on weaning weight at 90 days ( $P \leq 0.01$ ) and parity of ewe on body weights at 30, 45 and 60 days age ( $P \leq 0.05$ ). The effect of weight of dam was non-significant on all the pre-weaning body weights studied.

**Keywords:** Body weight, deccani, sheep, growth

### Introduction

Deccani is an important sheep breed of Deccan plateau which are medium-sized animals with predominantly black or black with white markings. This breed is well-suited to the extreme temperatures of the Deccan peninsula which is capable of long-distance migration and has been traditionally reared by pastoral communities such as the Kurmas and Gollas in Telangana. India ranks second in the World and Telangana state ranks first in the country in sheep population. Major reasons for the low productivity in this breed are due to inadequate grazing resources, disease problems and serious lack of organized efforts for genetic improvement. There is little selection of breeding rams, and much inter-mating among neighbouring breeds takes place.

With diminishing grazing resources and increasing demand of mutton and wool, there is urgent need to genetically improve the performance of Deccani sheep as major emphasis is required on improvement of well adapted indigenous breeds like Deccani to harness the better adaptive traits developed through natural selection. Thus, the present study was conducted to investigate the pre- weaning growth performance in Deccani sheep breed.

### Materials and methods

A total of 300 purebred Deccani lambs born to fifteen sires were evaluated for their pre weaning growth. The experimental animals were housed in sheds with mud floor and asbestos sheets as roofing material. Grazing was allowed from 9.00 am to 5.00 pm daily. Green fodder @ 3 kg and concentrate mixture (CP 18%) @ 300 gm/animal was provided. Performance traits included in the study were BW0, BW15, BW30, BW45, BW60, BW75 and BW90 representing the body weights at birth, 15, 30, 45, 60, 75 and 90 days of age, All the experimental lambs were weighed at the time of birth and at fortnightly intervals up to three months (90 days) of age with 50 gm accuracy. The data was subjected to least squares analysis (Harvey, 1966) [14] and the means were compared by Duncan's multiple range test (DMRT) to study the influence of various genetic and non genetic factors such as season of birth (two classes), sex of the lamb (two classes), ewe weight at lambing (three classes) and parity of the ewe at lambing (four classes).

### Results and discussion

Present study revealed significant influence of sex on birth weight only ( $P \leq 0.05$ ). Ganesan *et al.* (2015) [11] and Balasubramanyam *et al.* (2012 and 2010) [4, 3] also found significant effect of sex on birth weight in Madras Red sheep. Significant effect of sex was observed on body weight at birth and other pre-weaning periods also in Malpura by (Gowane *et al.*, 2010) [12]; Marwari by (Nirban *et al.*, 2015 and Singh *et al.*, 2013) [19, 20]; Nali by (Albial *et al.* (2014) [1];

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Muzaffarnagari by Deccani by (Mane *et al.*, 2014 and Chikurdekar *et al.*, 2012) [17, 5] and in Magra sheep by (Vivekanand *et al.*, 2014) [21]. Male lambs were significantly heavier ( $2.78 \pm 0.04$  kg) than female lambs ( $2.67 \pm 0.04$  kg) at birth and this superiority of males continued throughout the pre-weaning period though non-significantly and similar findings were also reported in different sheep breeds by Nirban *et al.* (2015) [19] in Marwari and Albial *et al.* (2014) [1] in Nali breed.

The present study revealed significant effect of season on BW90 ( $P \leq 0.01$ ) only while published literature revealed significant effect of season of birth on all pre-weaning body weights in a number of sheep breeds as per (Ganesan *et al.*, 2015 [11]; Balasubramanyam *et al.*, 2012 and 2010 [4, 3] in Madras red; Albial *et al.*, 2014 [1] in Nali; Mane *et al.*, 2014 [17]; Chikurdekar *et al.*, 2012 [5] in Deccani and Chopra *et al.*, 2010 [6] in Bharat merino sheep). Lambs born during minor season i.e., summer born lambs attained higher body weight than those born during major season i.e., winter born lambs at 45, 60, 75 and 90 days of age. Similar findings were also reported by Nehra *et al.* (2006) [18] in Marwari and Mane *et al.* (2014) [17] in Deccani sheep breed. Adequate nutrition during the summer months by providing additional feed and fodder might be the reason for attaining higher body weight in summer season than winter season.

Contrary to the findings of Ganesan *et al.* (2015) [11] in Madras red, (Nirban *et al.* 2015, Singh *et al.* 2013 and Nehra *et al.* 2006) [19, 20, 18] in Marwari and Chopra *et al.* (2010) [6] in Bharat Merino breed a non-significant effect of dam weight was observed in the present study on all pre-weaning body weights. Adequate nutrition provided during the present study might have smoothened the effect of dam weight on lamb weights.

Lambs born during third parity had significantly ( $P \leq 0.05$ ) higher body weights at 30, 45 and 60 (Table.1) days age ( $6.10 \pm 0.13$ ,  $7.76 \pm 0.15$  and  $9.34 \pm 0.18$  kg) followed by fourth, second and first parity ewes. Similar significant influence was reported by Albial *et al.* (2014) [1] in Nali and Vivekanand *et al.* (2014) [21] in Nali and Magra sheep wherein the parity of

ewe significantly affected all the pre-weaning body weights. However, Nirban *et al.* (2015) [19] and Singh *et al.* (2013) [20] in Marwari sheep breed reported significant effect of parity on birth weight only. It may be due to increase in milk production as parity order advanced hence the higher order parity ewes born lambs have weights in increasing trends as the parity order increased.

The overall least squares means recorded were  $2.72 \pm 0.03$ ,  $4.37 \pm 0.07$ ,  $5.90 \pm 0.10$ ,  $7.49 \pm 0.12$ ,  $9.03 \pm 0.14$ ,  $10.32 \pm 0.15$  and  $11.48 \pm 0.16$  kg at birth, 15, 30, 45, 60, 75 and 90 days of age, respectively (Table.1). As per the research findings reported in Deccani sheep breed the body weights obtained in the present study were lower than those reported by Mane *et al.* (2014) [17] who reported BWO and BW90 as  $3.44 \pm 0.01$  and  $15.66 \pm 0.09$  kg and Annual Report, ICAR (2009-10 and 2010-11) reported BWO ranging from 3.41 to 3.43 kg and BW90 ranging from 15.46 to 16.40 kg and Chikurdekar *et al.* (2012) [5] reported BWO as  $2.87 \pm 0.01$  kg and BW90 as  $13.86 \pm 0.10$  kg.

In other sheep breeds the present results were lower when compared to research findings by Gowane *et al.*, (2010 and 2015) [12, 13]; Arora *et al.*, (2014) [2] and Kumar *et al.*, (2008) [16] in Malpura breed which ranged from 2.64 to 3.55kg for BWO and 13.09 to 15.08 kg for BW90. Similar higher body weight values in research findings were reported by Nirban *et al.* (2015) [19] and Singh *et al.* (2013) [20] in Marwari sheep with BWO and BW90 as 3.10 to 3.14kg and 15.01 to 15.13 kg; in Muzaffarnagari reported a range of 3.62 to 3.65 kg for BWO and 14.80 to 15.22 kg for BW90 and Vivekanand *et al.* (2014) [21] in Magra sheep breed reported BWO and BW90 as  $2.98 \pm 0.02$  and  $14.54 \pm 0.11$  kg.

However, more or less similar weights were reported by Ganesan *et al.* (2015) [11] and Balasubramanyam *et al.* (2012 and 2010) [4, 3] in Madras red breed with BWO and BW90 range as 2.67 to 2.82 and 9.40 to 10.96 kg ; Karunanithi *et al.* (2011) [15] in Mecheri breed BWO as  $2.82 \pm 0.01$ kg and BW90 as  $10.9 \pm 0.1$  and Nehra *et al.* (2006) [18] in Marwari sheep breed reported a BWO as  $2.77 \pm 0.04$  and BW90 as  $11.78 \pm 0.20$  kg.

**Table 1:** Least squares mean pre-weaning body weights (Kg) of Deccani lambs

Effect	BW0		BW15		BW30		BW45		BW60		BW75		BW90	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
Overall	2.72	0.03	4.37	0.07	5.90	0.10	7.49	0.12	9.03	0.14	10.32	0.15	11.48	0.16
Sex														
Male	2.78 <sup>a</sup>	0.04	4.45	0.08	5.90	0.13	7.54	0.14	9.05	0.17	10.35	0.18	11.57	0.19
Female	2.67 <sup>b</sup>	0.04	4.28	0.09	5.90	0.13	7.44	0.15	9.01	0.17	10.29	0.19	11.38	0.19
Season														
Jan. To June	2.69	0.04	4.28	0.10	5.77	0.14	7.50	0.16	9.18	0.19	10.48	0.21	11.80 <sup>a</sup>	0.21
July to Dec.	2.76	0.03	4.45	0.08	6.03	0.11	7.48	0.13	8.88	0.15	10.16	0.16	11.16 <sup>b</sup>	0.17
Ewe Weight														
<25 kg.	2.69	0.03	4.38	0.08	5.99	0.11	7.62	0.13	9.16	0.15	10.41	0.17	11.54	0.17
25to30kg	2.74	0.04	4.35	0.08	5.93	0.12	7.59	0.13	9.14	0.16	10.26	0.17	11.39	0.18
>30 kg.	2.74	0.07	4.37	0.16	5.77	0.24	7.25	0.27	8.78	0.32	10.29	0.35	11.50	0.36
Parity														
1	2.62	0.04	4.18	0.10	5.60 <sup>b</sup>	0.15	7.21 <sup>b</sup>	0.17	8.65 <sup>b</sup>	0.20	10.03	0.21	11.17	0.22
2	2.72	0.05	4.32	0.11	5.86 <sup>ab</sup>	0.16	7.39 <sup>ab</sup>	0.18	8.98 <sup>ab</sup>	0.21	10.32	0.23	11.51	0.24
3	2.72	0.04	4.43	0.09	6.10 <sup>a</sup>	0.13	7.76 <sup>a</sup>	0.15	9.34 <sup>a</sup>	0.18	10.53	0.19	11.63	0.20
4	2.83	0.07	4.53	0.16	6.04 <sup>ab</sup>	0.24	7.60 <sup>ab</sup>	0.28	9.14 <sup>ab</sup>	0.32	10.40	0.35	11.59	0.36

Means with similar superscripts in a column within the effect do not differ significantly ( $P \geq 0.01$ )

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