Growth performance of Chhotanagpuri sheep under field condition

Maroof Ahmad* and D K Singh
Department of Animal Genetics & Breeding, College of Veterinary Science and Animal Husbandry, Birsa Agricultural University, Ranchi 834 006, India

ABSTRACT

Present study was undertaken on 242 Chhotanagpuri lambs in tribal areas of Deoghar District of Jharkhand. The body weights at different ages viz. birth weight (BWT), 3-month (3-WT), 6-month (6-WT), 9-month (9-WT) and 12-month (12-WT) were recorded for the study. The overall body weights of Chhotanagpuri lambs were 1.76± 0.06, 6.52 ± 0.14, 10.43±0.17, 13.44±0.20 and 16.44±0.18 kg at birth, 3, 6, 9 and 12-month of age, respectively. Lambs born during winter season were significantly heavier at birth than those born during summer and monsoon.Male lambs weighted significantly heavier than the female lambs at different stages of growth. Body weight of male lambs at birth, 3, 6, 9 and 12-months of age were 1.86±0.04, 7.02±0.12, 11.02±0.13, 14.16±0.24 and 17.64±0.23 kg respectively. The corresponding values for females were 1.65 ± 0.04, 6.01 ± 0.18, 9.83 ± 0.22, 12.72 ±0.18 and 15.24±0.12 kg. The variations in birth weight and weights at different stages of growth up to 12-month of age due to dam's weight at lambing were also significant. The average daily gain in body weights of Chhotanagpuri lambs were estimated as 52.88 ± 1.44, 43.44±1.10 and 33.38±1.21 g/day during 0-3, 3-6 and 6-12 month of age, respectively.

Key Words: Chhotanagpuri sheep, growth traits, body weight gain
***Corresponding author:** maroofahmad786@yahoo.co.in
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INTRODUCTION

Chhotanagpuri is the only recognized breed of sheep found in Jharkhand. The breed is distributed in the entire area of Jharkhand including adjacent districts of West Bengal (Purulia, Western part of Bankura and west of Medinapur district). These animals are mostly in the hands of weaker sections of the society. The size of the breed is small having straight nose, short drooping or horizontal ears and short tail. These animals are being maintained solely for mutton production. They produce coarse wool of poor quality, which may be utilized for carpet manufacturing. The information on growth parameters on Chhotanagpuri under field condition is scantyHence, this study was conducted to estimate the pattern of growth in Chhotanagpuri sheep under prevailing natural and ecological conditions of Jharkhand, India.

MATERIALS AND METHODS

Data on 242 Chhotanagpuri lambs belonging to Deoghar district of Jharkhand were used in the present investigation. The data was generated under Mega Sheep Deed Project of ICAR at Birsa agricultural University, Ranchi, Jharkhand. The average elevation of the district is 247 m above msl. Average annual rainfall is 1239 mm, mean summer maximum temperature is 43°C and mean winter minimum temperature is 8 °C. The body weights at different ages viz. birth weight (BWT), 3-month (3-WT), 6-month (6-WT), 9-month (9-WT),12-month (12-WT) and average daily gain were considered for the study. All the observations were taken in the morning before grazing or being allowed feed or water to the animals. The season was divided into three: the main winter (November to February), summer (March-June) and mansoon (July-October). The weight was recorded with the help of 120 kg weighing balance with 100 g accuracy. The animals were maintained only on grazing and allowed for 6-7 hours during day on natural grasses and shrubs. The data collected were analyzed by least-squires method (Harvey, 1990).

RESULTS AND DISCUSSION

The overall body weights of Chhotanagpuri lambs were 1.76± 0.06, 6.52 ± 0.14, 10.43±0.17, 3.44 ±0.20 and 16.44±0.18 kg at birth, 3, 6, 9 and 12-month of age, respectively. Higher values for these traits were reported by Kushwaha (1994), Kushwaha *et al.* (1997) and Kumar (2000) in various breeds of sheep.

Effect of seasons

Lambs born during winter season were significantly heavier at birth than those born during summer and monsoon (Table 1), which did not differ significantly between themselves. This could be probably due to availability of better quality of green fodder during post monsoon and winter season to ewes in gestation as majority of winter lambing occurred in the month of February. Winter born lambs continued to grow heavier than monsoon born lambs but the superiority over summer born lambs disappeared by reaching weaning age.. Winter born lambs weighed significantly heavier than those born during monsoon. Highly significant effect due to season of birth was also reported by Tomar *et al.* (2000).. Non-significant effect due to season of birth have been reported by Singh and Dhillon (1992) and Swain *et al.* (1994) for birth weight and Singh and Dhillon (1992) for 6 and 12 month of body weights in Avikalin sheep

Effect of sex

Male lambs weighted significantly heavier than the female lambs at different stages of growth. Body weight of male lambs at birth, 3, 6, 9 and 12-months of age were 1.86±0.04, 7.02±0.12, 11.02±0.13, 14.16±0.24 and 17.64±0.23 kg respectively. The corresponding values for females were 1.65 ± 0.04, 6.01 ± 0.18, 9.83 ± 0.22, 12.72±0.18 and 15.24±0.12 kg. Non-significant effect due to sex of lamb was observed by Kandasamy *et al.* (1980) on birth weight and Kumar (2000) for weaning weight in various sheep breeds.

Effect of dam's weight at lambing

The variations in birth weight and weights at different stages of growth up to 12-month of age due to dam's weight at lambing were also significant. Ewes weighed 20.00 kg or more at lambing delivered significantly heavier lambs (Table 1) as compared to those weighed 10.00-15.00 and 15.00-20.00 kg at lambing. These groups differed significantly among themselves. Lambs produced by heavier ewes continued to weigh heavier up to 12-month of age than those produced by lighter ones. The average body weights of lambs of ewes weighted ≥20.00 Kg at lambing were 2.03 ± 0.04, 7.72 ± 0.09, 11.08 ± 0.13, 15.22 ± 0.15 and 17.64 ± 0.16 kg at birth, 3, 6, 9 and 12-month of age.

Average Daily gain in body weights

The average daily gain in body weights of Chhotanagpuri lambs were estimated as 52.88 ±

Table 1: Least squares means of body weights (kg) of Chhotanagpuri lambs

Effect	Body weights				
	Birth	**3-M**	**6-M**	**9-M**	**12-M**
Overall(μ)	1.76 ± 0.06 (242)	6.52 ± 0.14(234)	10.43 ± 0.17(217)	13.44 ± 0.20(206)	16.44 ± 0.18(192)
Seasons of birth	*	*	**	**	*
Winter	1.81 ± 0.03^{a}(118)	6.70 ± 0.04^{a}(115)	10.94 ± 0.14^{a}(108)	14.72±0.25^{a}(102)	17.46±0.25^{a}(96)
Summer	1.76 ± 0.04^{b} (87)	6.62 ± 0.07^{a} (85)	10.45 ± 0.15^{ab}(81)	13.38±0.26^{b}(77)	16.64±0.27^{ab}(72)
Monsoon	1.71 ± 0.02^{b}(37)	6.23 ± 0.28^{b}(34)	9.89 ± 0.26^{b}(28)	12.26± 0.13^{c}(27)	15.24±0.11^{b}(24)
Sex	*	**	**	**	**
Male	1.86 ± 0.04^{a} (127)	7.02 ± 0.12^{a}(124)	11.02 ± 0.13^{a}(114)	14.16±0.24^{a}(108)	17.64±0.23^{a}(102)
Female	1.65 ± 0.04^{b} (115)	6.01 ± 0.18^{b}(110)	9.83 ± 0.22 ^{b}(103)	12.72±0.18^{b}(98)	15.24±0.12^{b}(90)
Dam's wt. at lambing	*	**	*	*	*
10.00- 15.00	1.45 ± 0.05^{c} (77)	5.06 ± 0.20^{c} (75)	9.43 ± 0.22^{b}(67)	12.08±0.23^{c}(61)	15.33±0.20^{c}(54)
15.00- 20.00	1.79 ± 0.02^{b} (133)	6.80 ± 0.19^{b}(129)	10.79 ± 0.20^{a}(122)	13.05±0.21^{b}(117)	16.36±0.17^{b}(112)
≥ 20.00	2.03 ± 0.04^{a} (32)	7.72 ± 0.09^{a}(30)	11.08 ± 0.13^{a}(28)	15.22±0.15^{a}(28)	17.64±0.16^{a}(26)

*P≤0.05, ** P≤0.01; Values bearing different superscripts for an effect in a column differed significantly,
Figures in parentheses are number of observations.

Table2: Least-squares means of average daily gain (g/day) in body weight of Chhotanagpuri lambs

Effect	Daily gain in body weights		
	ADG-1 0-3 month	ADG-2 3-6 month	ADG-3 6-12 month
Overall(μ)	52.88 ± 1.44 (234)	43.44±1.10 (217)	33.38±1.21 (192)
Seasons of birth	*		**
Winter	53.74 ± 1.65 [a] (115)	43.68 ± 1.14 (108)	34.24±1.16[a] (96)
Summer	52.84 ± 1.73[ab] (85)	44.33 ± 1.14 (81)	34.06±1.14[a] (72)
Monsoon	50.78 ± 1.02[b] (34)	44.36 ± 0.94 (28)	32.15±1.27[b] (24)
Sex	**	**	**
Male	56.84 ± 1.76[a] (124)	46.29 ± 1.14[a] (114)	35.78 ± 1.14[a] (102)
Female	49.07 ± 1.46[b] (110)	42.89 ± 1.22[b] (103)	31.52 ± 1.22[b] (90)
Dam's wt. (kg) at lambing	**	*	**
10.00- 15.00	42.12 ± 1.62[c] (75)	48.33 ± 1.14[a] (67)	32.72 ± 1.14[a] (54)
15.00- 20.00	54.78 ± 1.70[b] (129)	44.27 ± 1.26[b] (122)	32.05 ± 1.12[a] (112)
≥ 20.00	61.64 ± 1.36[a] (30)	44.21 ± 0.92[b] (28)	36.54 ±1.31[b] (26)

*P≤0.05, ** P≤0.01; Values bearing different superscripts for an effect in a column differed significantly;
Figures in parentheses are number of observations.

1.44, 43.44±1.10 and 33.38±1.21 g/day during 0-3, 3-6 and 6-12 month of age, respectively. Higher values for average daily gain were observed by Sinha and Singh (1997) in Muzaffarnagri sheep. A significant effect of seasons of birth on ADG was observed during 0-3 and 6-12 month of age. However, variations due to sex were significant (P≥0.01) on ADG during different periods of growth under observation. There was significant effect of ewe's weight at lambing on ADG during 0-3, 3-6 and 6-12 month of age. The average daily gain in body weight of winter born lambs during 0-3 (53.74 ± 1.65 g/day) and 6-12 (34.24 ± 1.16 g/day) month of age was significantly more than those born during monsoon (50.78 ± 1.02 and 32.15 ± 1.27 g/day). The differences between lambs born during summer and monsoon seasons for average daily gain in body during 0-3 month of age was not significant but it differed significantly during 6-12 months of age. The effects of sex on daily gain in body weight of lambs during 0-3, 3-6 and 6-12 months of age were significant. Males had significantly higher daily gain in body weight than females.

The variations in average daily gain in body weights during 0-3, 3-6 and 6-12 months of age due to dam's weight at lambing were significant. Lambs of ewes weighed ≥ 20.0 kg at lambing had significantly higher daily gain in body weight (Table 2) during 0-3 months of age than those of ewes weighed 15-20 and 10-15 kg at lambing. During 6-12 months of age, the lambs of ewes weighed ≥ 20.0 kg at lambing had significantly higher daily gain in body weight.

Venkateswarlu and Ramana **(**2013) reported significantly increase in weight gains in concentrate supplemented lambs than sole grazed ram lambs. Higher ADG values were also reported by Chaturvedi *etal.* (2009) in lambs maintained on 8 hours grazing plus supplementation of concentrate at 300g per animal day.

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