Evaluation of Body Weight and Body Measurements of Lesser-known Gang-Fatehpuri Sheep of Uttar Pradesh, India

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Abstract

The present study was aimed to evaluate morphometric characteristics of lambs of less known native sheep of Gang-Fatehpuri of Fatehpur district of Uttar Pradesh during different growth stages in its breeding tract for breed recognition and registration with NBAGR, Karnal, India. A total of 365 lambs of either sex of different age groups (94, 102, 95, and 74 heads of 3, 6, 9, and 12 months of age, respectively) were surveyed in 15 villages of Fatehpur district. The overall values of body weight and body measurements, *viz.*, body length, height at withers, chest girth, tail length, and ear length recorded at 12 months of age (sexual maturity) were 29.62 ± 0.46 kg, 73.47 ± 0.46 cm, 73.54 ± 0.51 cm, 77.63 ± 0.43 cm, 40.08 ± 0.23 cm, and 18.29 ± 0.13 cm, respectively. The mean values of all the traits, except ear length, of male lambs, were significantly ($p < 0.05$) higher/larger than female lambs. The differences gradually increased significantly ($p < 0.01$) with advancing age from 3 months to 12 months. The values were generally comparable with the earlier known sheep breeds like Muzaffarnagari, and Kajali of the region.

Keywords: Body measurements, Body-weight, Gang-Fatehpuri, Mutton type breed.

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Introduction

India has vast biodiversity of ovine genetic resources with multipurpose utility for wool, mutton, milk, skin, and manure. The livestock population develops through unique adaption to their agro-climatic environments and their survival over a prolonged duration. Sheep rearing is a valuable component of the rural economy of India's arid, semi-arid and hilly areas. A systematic attempt to characterize and conserve animal breeds were started after establishing the National Bureau of Animal Genetic Resources (NBAGR) at Karnal, India. In addition to 44 well-recognized sheep breeds, many unrecognized, uncharacterized, and lesser-known sheep genetic populations are disseminated in the entire country. The biometric measurements of different body parts have a significant relationship with the body-weight of animals (Nayak *et al.*, 2008; Mishra *et al.*, 2016; Dass *et al.*, 2019).

The body measurements (body length, height at withers, chest girth) and body weight are used as an indicator of adult size, feeding requirements, and physiological maturity of animals. Furthermore, based on body measurements, an association can be established between body conformation and functionality of animals. Thus, body measurements can assist in the evaluation of growth performance as well as the meat production potential of Gang-Fatehpuri sheep. In view of the facts above, the present study aimed to evaluate the body weights and body morphometric measurements during the growth period of one year of this breed, as part of its recognition and registration with the Animal Genetics Bureau.

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Fig. 1: 12 months old Gang-Fatehpuri lamb

Table 1: Mean (± SE) body weight of Gang-Fatehpuri lambs of different age groups

Gender/Sex	Body weight (kg) at different age			
	3 month	6 month	9 month	12 month
Male	16.02 ± 0.26^a (39) ±	23.64 ± 0.32^a (41)	28.27 ± 0.27^a(36)	33.76 ± 0.65^a (25)
Female	14.70 ± 0.16^b (55)	20.57 ± 0.26^b (61)	24.35 ± 0.23^b (59)	27.52 ± 0.50^b (49)

Means bearing different superscript within a column differ significantly (p < 0.01).
Figures in parentheses are the number of observations.

Table 2: Means of biometric measurements of Gang-Fatehpuri lambs of different age groups

Age	Gender	n	BL	HW	CG	TL	EL
3 Month	Male	39	51.17 ± 0.38^a	52.12 ± 0.37^a	55.94 ± 0.48^a	32.94 ± 0.17^a	15.81 ± 0.17
	Female	55	50.00 ± 0.30^b	51.15 ± 0.30^b	54.01 ± 0.44^b	31.97 ± 0.12^b	15.50 ± 0.13
6 Month	Male	41	62.11 ± 0.42^a	62.09 ± 0.49^a	66.74 ± 0.74^a	37.50 ± 0.36^a	16.20 ± 0.33
	Female	61	60.37 ± 0.41^b	60.03 ± 0.43^b	64.80 ± 0.64^b	35.78 ± 0.26^b	16.11 ± 0.14
9 Month	Male	36	69.09 ± 0.39^a	70.79 ± 0.36^a	74.23 ± 0.49^a	39.39 ± 0.53^a	17.52 ± 0.33
	Female	59	66.11 ± 0.33^b	66.04 ± 0.31^b	70.40 ± 0.31^b	37.70 ± 0.34^b	16.62 ± 0.18
12 Month	Male	25	76.48 ± 0.59^a	76.70 ± 0.65^a	80.60 ± 0.54^a	41.98 ± 0.37^a	18.50 ± 0.22
	Female	49	71.94 ± 0.51^b	71.93 ± 0.58^b	76.11 ± 0.46^b	39.05 ± 0.29^b	18.19 ± 0.16

n- No. of animal, BL- Body length, HW- Height at withers, CG- Chest girth, TL- Tail length, EL- Ear length.
Means bearing different superscript within a column differ significantly (p < 0.05).

MATERIALS AND METHODS

In the present study total of 365 Gang-Fatehpuri lambs (fig.1) from 15 flocks of rural areas of Fatehpur district of UP, India, were included and categorized into male and female with different age groups (3, 6, 9, and 12 months) of animals.

The traits studied were body weight (BW), body length (BL), height at withers (HW), chest girth (CG), tail length (TL), and ear length (EL). Animals were weighed on the digital balance, and the biometric measurements were observed with the help of non-stretchable measuring tape after making the animals stand squarely on an even ground. The BL, HW, CG, TL, and EL were measured by gauging the horizontal distance between the point of shoulder and pin bone, vertical distance between ground to the highest point of withers, circumference of chest just behind anterior legs, distance from base to tip of the tail and root to tip of the ear, respectively. To assess the effect of sex of lamb on body measurements, 'Z' test statistics (two samples mean) was carried out.

RESULTS AND DISCUSSION

The data presented in Table 1 revealed that the body-weight of male lambs was significantly (p < 0.05) higher as compared to females of 3 months of age groups, and thereafter the differences were highly (p < 0.01) significant, the values of males being higher at 6, 9 and 12 months of age as compared to females of respective age groups. These results of body weight of the Gang-Fatehpuri lambs compared well with the findings of Jaisalmeri (Arora *et al*., 2007), Muzaffarnagari (Dass and Prasad, 2007), and Malpura (Paswan *et al*., 2016) sheep breeds. On the contrary, lower body weights were reported in Magra, Kheri, Malpura, and Sonadi sheep by Mehta *et al*. (2003), Gowane and Arora (2010), Gowane *et al*. (2015), and Sharma *et al*. (2019), respectively.

The BL and HW were significantly (p < 0.05) higher in males than females of 3 months of age, whereas highly significant differences were observed in other higher age groups. Likewise, CG and TL were significantly (p < 0.01) higher in males than females in all age groups. There was no significant difference in EL between male and female sheep. The gender difference in all the traits studied gradually widened with advancing age till 12 months (Table 2). Similar trends were observed earlier in Ganjam (Nayak *et al*., 2008) and Kajali (Mishra *et al*., 2016) sheep. The present findings also compared well with observations in Muzaffarnagari sheep (Mandal *et al.,* 2011). Unlike current observations, Mishra *et al*. (2008) in Garole x Malpura half-bred sheep and Prasanna (2019) in Vizianagaram sheep recorded lower BL, HW, CG, TL, and EL.

CONCLUSION

Based on current observations, it can be inferred that male lambs are significantly larger and heavier than female contemporaries, and this new, less known ovine genetic group apparently differs in terms of body measurements compared to established sheep breeds of India.

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