

Phenotypic characterization, biometry and management of Singharey goat of Sikkim

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Generally, goats thrive in a moderate climate having temperature between 15- 30°C but sustains also under harsh climatic conditions. This species prefer hilly terrain rocky mountaineous region where it can find variety of vegetation. The goat population of India is about 135 million (Livestock Census 2012) which is constituted by 24 descript breeds (30-35%) and rest inadequately studied and undocumented populations. Singharey is one of such goat populations inhabiting the Sikkim state. The topography of Sikkim is very much suited to the goat farming The goat population of Sikkim state of NEH region of India has increased from 110, 120 (18th Livestock Census 2007) to 113,364 (19th LC 2012) spread in all the four districts i.e. east Sikkim (18,046), west Sikkim (45,232), north Sikkim (15,018) and south Sikkim (31,824). The male and females are almost in equal proportion (53,103 and 60,261 respectively). Not much information is available on the goats of Sikkim state. Therefore, the study was planned to know the phenotype and biometry of Sikkim goats.

Sikkim is one of the smallest states of India. Located in the eastern Himalayan mountains, it is bounded by the independent Himalayan kingdoms of Nepal to the west and Bhutan to the east; by the Tibet autonomous region of China to the north and northeast; and, in India, by West Bengal state to the south. The visits were made to east, west, north and south districts of Sikkim to get information on

phenotypic and biometric traits of its native goats. The goats are spread throughout Sikkim consisted of black, white, brown and mixture of these colours (Verma *et al.* 2015) but goats with stripes on face extending from base of horn to the muzzle and upper jaw mainly constituted the flocks. These goats are called as Singharey by the local people. Data on measurements of eight biometrical traits namely height at withers (body height), body length, chest girth, paunch girth, face length, horn length, ear length and tail length on 383 goats including 200 Singharey goats belonging to different sexes, age groups from different districts of Sikkim were generated. Body weights were measured with the help of spring balance. The data were analysed to find the average measurements with their standard errors.

Singharey is a typical native goat of Himalayan region and the adjoining areas of Sikkim. As informed by the local people these goats have been surviving in the Himalayan terrain and rocky mountain slopes of Sikkim since ancient times. Although, Singharey goats are spread through out the Sikkim but concentration of these goats is more in West district of Sikkim.

Utility: In Sikkim, goat farming is a popular and traditional way of livelihood system associated with poor and marginal farmers. It has remained a sustainable source of income to majority of small and marginal farmers even



Fig. 1. Colour variants of Singharey goats.

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under the odd climatic conditions. Like other eastern states, here also goats are reared mainly for meat purpose. The average market value of goat mutton varies between ₹ 250 to 300 per kilogram, however, during festival seasons the value goes still higher.

Phenotypic traits: Singharey goats are of brown, fawn



Figs 2–5. 2. Semi pendulous ears; 3. Rudimentry ears; 4. Black top line; 5. Black ring around neck.

and black and white colour. The distinct feature of Singharey goats from other goats of Sikkim is the presence of white stripes on the face. These stripes extend from base of the horns up to muzzle and upper jaw (Fig. 1). The eyes are bright and small. The head is medium in length. The ears are short to medium, semi-pendulous with round tip and have black or white margin on the apical half (Fig. 2). Rudimentary ears were also observed in few cases (Fig. 3). The horns are strong, flat, thicker at the base but pointed at the tip, orienting upward and backward. The under belly is generally light brown or white. Legs are short, stout,

medially black or white. Black top line was seen in many of these goats (Fig. 4). Hair is seen on thigh region of some animals (Fig. 1). In breeding bucks, a prominent black colour ring was observed around the neck (Fig. 5) which is absent or poorly developed in castrated males. Udder and teats are moderately developed.

Biometry: Singharey goats constitute the major part of the Sikkim goat population. They can be distinguished from other 2 populations by the facial stripes. The average measurements for different body traits of 3 months age, up to 6 months age, up to 12 months age and adult (>18 months) goats are presented in Table 1. The means with standard errors for height at withers, body length, chest girth, paunch girth, face length, horn length, ear length and tail length of adult animals having age more than 18 months were 52.52 ± 0.71 , 60.29 ± 0.66 , 67.98 ± 0.59 , 74.52 ± 1.25 , 16.16 ± 0.19 , 8.84 ± 0.33 , 13.48 ± 0.18 & 10.88 ± 0.24 respectively in females and 55.67 ± 0.93 , 61.48 ± 0.86 , 71.66 ± 0.85 , 76.47 ± 1.16 , 17.20 ± 0.22 , 14.58 ± 0.57 , 12.92 ± 0.24 & 11.89 ± 0.25 respectively in males'. The body weights were increased with age and were 27.33 ± 0.65 kg in adult females and 31.03 ± 0.92 in males (Table 1).

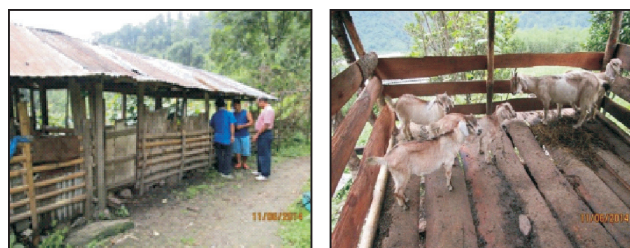


Fig. 6. Type of goat housing.



Fig. 7. Stall feeding of Singharey goats.



Figs 8–9. 8. Udder and teats; 9. Singharey twins.

Table 1. Biometry and body weights of Singharey goats of different age groups

Age group	SEX	N	Traits								
			Body height	Body length	Chest girth	Paunch girth	Face length	Horn length	Ear length	Tail length	Body weight
3 month	F	15	36.57±1.11	43.07±1.00	47.21±1.58	51.00±2.08	12.07±0.18	2.00±0.18	11.21±0.46	9.00±0.38	10.53±0.62
	M	16	33.86±2.23	41.14±1.28	46.00±1.54	51.21±2.72	11.86±0.63	2.46±0.42	10.43±0.29	8.64±0.40	10.31±0.91
Up to 6 month	F	16	45.81±1.02	49.94±1.05	52.69±1.47	55.81±2.32	13.69±0.46	4.56±0.34	11.94±0.25	9.56±0.27	13.88±0.75
	M	06	41.33±2.23	46.33±1.67	53.33±2.79	57.83±4.44	14.00±0.37	4.83±0.91	11.367±1.05	8.17±0.75	12.83±1.01
Up to 12 month	F	15	50.93±1.02	53.12±1.47	57.87±1.31	64.07±1.75	14.93±0.30	6.53±0.67	12.67±0.61	10.00±0.43	16.80±0.73
	M	13	47.15±1.01	50.00±1.22	62.15±2.45	66.00±2.00	15.62±0.49	8.38±0.64	11.85±0.50	9.85±0.36	18.62±1.17
Adult	F	56	52.52±0.71	60.29±0.66	67.98±0.59	74.52±1.25	16.16±0.19	8.84±0.33	13.48±0.18	10.88±0.24	27.33±0.65
	M	64	55.67±0.93	61.48±0.86	71.66±0.85	76.47±1.16	17.20±0.22	14.58±0.57	12.92±0.24	11.89±0.25	31.03±0.92

Management of Singharey goats: The preliminary information recorded through the interaction with the goat keepers indicated that these goats are maintained on semi-extensive management by small and marginal farmers of Sikkim. The animals are taken to hill forests in the morning and are brought back in the evening. In the night they are kept in a temporary structured shelters.

Housing: Goat houses are made of bamboo sticks and wooden logs with no proper arrangement of electric and water supply. The floor in majority of goat house were raised 3-4 ft. from the ground. This type of flooring keeps the house neat and clean as all the droppings do not accumulate on the floor. The raised flooring also provide good ventilation. In some houses, the mangers are also made on the outer wall.

Feeding: Goats are kept on local vegetation available in the jungle. There are plenty of barren and fallow pastureland, Gaucharan with plenty of wild grasses which are easily acceble to the goats. Goats being the small ruminant can browse easily in such difficult mountain slopes. Stall fed goats are kept on local grass, crushed maize and tree leaves.

Performance: Singharey goats have moderately developed udder but with small conical shaped teats. Milk yield is approximately 300 – 500 ml / day. However, milking the goat is not practiced on regular basis. The milk is left for kids suckling. The male goats mature and becomes able to serve at the age of 9-10 months. In majority of cases, the males are castrated at younger age (3 months). The age of maturity in female goats also varies between 9-12 months. The gestation period ranges between 145-155 days. Twinning is very common in these goats. Breeding is through natural mating. Most of the males are castrated at the younger age for their enhanced body growth. The breeding males kept by the farmers are genetically poor and are associated with reproductive problems. The cases of infertility and productivity are commonly met. We have also seen the arthritis problem in few cases. Few years back government has started a cross breeding programme with Jamunapari breed of goat as pilot programme. The cross bred performed well in certain areas.

Singharey goats are phenotypically distinct from the other populations i.e. Bengal type, Asom local and long fiber goats of NEH region. They are well adapted to the geographical climatic conditions of Sikkim and are performing well under semi extensive management system. It is a good source of livelihood to the farmers of Sikkim. As no other population from the whole NEH region is on the national list of registered breeds, Singharey goats can

be a suitable candidate for registered breed. The population needs to be improved and propagated as population with uniform phenotype by using the Singharey breeding bucks.

SUMMARY

Singharey, a typical native goat of Sikkim, is inadequately studied and has not been documented well. These goats are spread in all the 4 districts but their concentration is more in West district of Sikkim. Singharey goats are of brown, fawn and black and white. The distinct feature of Singharey goats is the presence of white stripes on the face, which extend from base of the horns up to muzzle and upper jaw. The morphological characteristics of the breed were studied. Goat houses are made of bamboo sticks and wooden logs with no proper arrangement of electric and water supply. The floor in majority of goat house were raised 3–4 ft from the ground. Stall fed goats are kept on local grass, crushed maize and tree leaves. Singharey goats have moderately developed udder but with small conical shaped teats. Milk production is approximately 300 – 500 ml / day. The male goats mature and becomes able to serve at the age of 9-10 months. In majority of cases, the males are castrated at younger age (3 months). The age of maturity in female goats also varies between 9-12 months. The gestation period ranges between 145 and 155 days. Twinning is very common in these goats. Breeding is through natural mating.

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