

Characterization and management of Sumi-Ne Goat of Nagaland under field conditions

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ABSTRACT

The study was focused to generate the data on morphological, biometrical traits and management of Nagaland long hair goat Sumi-Ne. Measurements were recorded from 215 animals consisting of different age groups of both sexes from 42 flocks belonging to different farmers. Information on management and performance parameters was recorded through interaction with the goat keepers. Different colour variants viz. white with black patches, black, brown with grey hair of long hair goats were seen. Long hair were present in the adult males. Animals were having proportionate body, straight nose line, medium size, erected, horizontally placed ears. The horns in females are shorter, pointed, directed upward and then slightly backward while that of males are thicker, longer, orienting upward and backward. Goats are maintained on extensive management system. The milk yield is 0.3 to 0.5 liters per day. The litter size varies from 1 to 4. Hair obtained from the Sumi-Ne goats has commercial utility for the tribal people. In view of the distinct phenotype and commercial utility but small population size, the Sumi-Ne goats of Nagaland needs further propagation and genetic improvement. The population has been registered as 28th goat breed of the country in the name of Sumi-Ne with accession number INDIA_GOAT_1400_SUMINE_06028.

Keywords: Management, Utility, Nagaland, Goats

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INTRODUCTION

North East hilly region of India is home to diverse animal genetic resources including cattle, buffalo, sheep, goat, pigs, equines, yaks, mithuns etc. About one-sixth of Nagaland is covered by tropical and sub-tropical evergreen forests including palms, bamboo and rattan as well as timber and mahogany forests which serves as shelter to many of these genetic resources. The state is mostly mountainous except those areas bordering Assam valley. North East Hill region contributes about 4.37 million goats to the total (135 million) goat germplasm of India. The goats here are maintained in difficult terrains under harsh climate. Goat population of Nagaland is about 99350 which also includes a unique goat germplasm bearing long hair and contributes significantly to the livelihood of tribal people of Nagaland. The population of long hair goats is about 8000 limiting to Zunheboto, Tuensang districts and are reared

mainly by Sumi tribe. The present study was focused to generate the information on morphological, biometrical traits and management of this particular genotype of Nagaland state and its variants. The information generated during the study also supported the claim for registering the breed which resulted in the registration of this population as 28th goat breed of the country. These goats are known by the name 'Nagaland long hair goat (NLHG) or Long hair Nagaland goat (LHNG) in the literature but registered in the name 'Sumi-Ne' with accession no. INDIA_GOAT_1400_SUMINE_06028 (NBAGR, 2017).

MATERIALS AND METHODS

The breeding tract of long hair goats was delineated with the consultation of state Animal Husbandry Department and Livestock Development Board of Nagaland. Visits were taken to different parts of Zunheboto, Tuensang, Kiphire, Phek and Dimapur

districts of Nagaland (fig. 1) to collect information on goats. The biometric measurements were recorded from 215 animals consisting of different age groups of both sexes from 42 flocks belonging to different farmers. The measurements were taken for body length, height at withers, chest girth, paunch girth, face length, horn length, ear length and tail length of different age group animals. The body weights were recorded with the help of 125 kg weighing balance with 100 g accuracy. The information on goat management and performance parameters were recorded through interaction with the goat keepers. Some of the farmers were having private goat farms established deep in the forest. The animals of those farms were also recorded. Data were compiled and analyzed to estimate the average measurements with standard errors.

RESULTS AND DISCUSSION

The goats are reared mainly for meat, coarse fiber and skin. The breed name (Sumi-Ne) has been derived from the name (Sumi) of rearing community. The size of flock maintained by them ranged from 2 to 76 which is a mixed flock of long hair as well as short hair goats. The long hair goats were mainly found in Zunheboto and Tuensang districts. The hair obtained from these goats is having a good commercial utility in the tribal culture of Nagaland.

Phe notypic traits: Different colour variants of long hair goats were seen during the visits to the breeding

tract. Sumi-Ne goats have white coat of long hair with black patches on the head and neck region. Some animals have black/ brown coat of mixed grey hair (fig 2). Long hair were present in adult males all over the body particularly in the neck region, whereas, in females, the long hair were present generally on thigh region.



Figure 2: Variants of long hair goat

The head profile and face features of long hair goats are shown in fig 3. The head appears proportionate to the body. Nose line is straight. The ears are of medium size, erect and are placed horizontally. The horns in females are shorter, pointed, directed upward and then backward while that of males are thicker, longer, orienting upward and backward. The wattles and beard are present in majority of goats. Muzzle is generally black. The colour of horns and hooves is grey. The belly and legs below knee joint are black. Udder is bowl shaped and teats are small and cone type. The udder in some cases were hairy (fig. 4). The Nagaland long hair goats have different phenotype than the long hair goats of J&K and Himachal Pradesh states of India which have been characterized by Aggarwal *et al.*, (2005) and Mishra *et al.*, (2010).



Figure 3: Face features of long hair goats

Biometric traits: The body measurements indicate the skeletal growth of the animals. Body length and height at withers gives an idea about bone growth while chest girth is a measure of development of



Figure 1: Nagaland state showing sampling areas



Figure 4: Hairy udder and conical teats

muscles, bones and fat and it has close relationship with the live weight. The measurements of eight different biometric traits were recorded on animals belonging to different age groups and flocks and average values are given in table 1. The average measurements for height at withers, body length, Chest/heart girth, paunch girth, face length, horn length, ear length and tail length in 3 months aged animals were 32.44 ± 0.83 , 40.48 ± 0.87 , 46.96 ± 0.99 , 52.15 ± 1.26 , 11.41 ± 0.23 , 1.80 ± 0.17 , 8.81 ± 0.31 , 7.00 ± 0.26 respectively; for 6 months it was 33.75 ± 0.64 , 45.77 ± 0.66 , 52.84 ± 0.75 , 58.19 ± 1.06 , 12.48 ± 0.20 , 2.90 ± 0.35 , 9.77 ± 0.19 , 7.84 ± 0.32 respectively; for 9 months 41.76 ± 0.64 , 49.38 ± 0.79 , 58.00 ± 0.78 , 65.38 ± 0.75 , 13.90 ± 0.37 , 5.05 ± 0.46 , 10.55 ± 0.41 , 8.86 ± 0.28 respectively. The values for the same parameters, in adult animals (more than 18 months), were 46.12 ± 0.45 , 56.94 ± 0.50 , 68.49 ± 0.66 , 77.77 ± 0.70 , 15.81 ± 0.15 , 8.44 ± 0.53 , 11.64 ± 0.18 , 9.50 ± 0.16 . The average body weights (kg) in the age groups of 3 month, 6 month, 12 month and adult animals were 7.89 ± 0.42 , 12.97 ± 0.39 , 16.62 ± 0.26 and 27.69 ± 0.73 respectively. The values for body weight determining parameters like height, length and chest girth were generally more in male animals than their female counter parts. The difference was more prominent in respect of height at withers, body length, chest girth and horn length of adult animals.

The average measurements for height at withers, body length, Chest/heart girth, paunch girth, face

length, horn length, ear length and tail length of adult long haired Sumi-Ne male goats are 48.43 ± 1.52 , 58.62 ± 1.73 , 71.24 ± 2.21 , 75.71 ± 2.20 , 16.19 ± 0.45 , 13.43 ± 1.74 , 10.70 ± 0.38 , 9.71 ± 0.29 cm respectively whereas for females the measurements for the same traits are 45.71 ± 0.61 , 56.35 ± 0.81 , 68.71 ± 1.03 , 77.44 ± 1.40 , 15.59 ± 0.28 , 7.79 ± 0.71 , 11.77 ± 0.35 , 9.24 ± 0.23 cm respectively. The overall average measurements irrespective of sex are 46.75 ± 0.71 , 57.22 ± 0.83 , 69.67 ± 1.06 , 76.78 ± 1.20 , 15.82 ± 0.24 , 9.98 ± 0.88 , 11.35 ± 0.27 , 9.42 ± 0.18 cm respectively. The average body weights for adult males and females are 31.48 ± 2.45 kg and 25.79 ± 1.05 kg respectively.

Long hair goats are found similar in size to its other variants. The difference in average measurements of pooled population and long hair goat population is not significant. The biometry of Sumi-Ne goats is also comparable with Changthangi of J&K state and Chegu of Himachal Pradesh. The values reported in Changthangi adult male for body length, heart girth, height at withers and body weight are 52.04 cm, 65.20 cm, 51.60 cm and 31.02 kg respectively and for adult female goats it is 49.80, 63.00, 49.00 cm and 25.72 kg respectively (Acharya, 1992). The body length, height at withers and chest girth average measurements for adult chegu males are 72.9 ± 5.1 , 66.2 ± 6.70 , 86.7 ± 7.00 cm respectively and for females 65.5 ± 3.9 , 58.1 ± 3.3 and 73.9 ± 3.80 respectively (Kaul *et al.*, 1990). The adult body weight is 39.9 ± 13.4 kg in males and 27.8 ± 10.3 kg in females.

Management: Information on management practices of Nagaland goats were collected through direct interview of farmers. The preliminary information recorded from the breeding tract indicated that these goats are mostly maintained on extensive management by small and marginal farmers. The animals are taken to hill forests in the morning and are brought back in the evening. The management practices for rearing goats is more or less similar to that of Sikkim goats (Verma *et al.*, 2015, 2015a) In the night they are kept in a temporary enclosures. The flock size with individual farmer ranged from 2 to over 20 consisting of kids and adults of both sexes.

Table 1. Estimated means and SE for different biometric traits and body weight in different age groups of Nagaland goats

TRAITS	AGE GROUP											
	3 Months			6 Months			12 Months			Adults (> 18months)		
	Females (16)	Male (22)	Overall (38)	Females (15)	Male (17)	Overall (32)	Females (9)	Male (12)	Overall (21)	Females (86)	Male (23)	Overall (109)
HW	30.7±1.46	33.6±0.89	32.44±0.83	37.3±1.00	37.75±0.84	33.7±0.64	42.1±1.31	41.5±0.60	41.7±0.64	45.3±0.41	48.6±1.40	46.12±0.45
BL	39.4±1.95	41.1±0.63	40.4±0.87	45.5±1.21	46.0±0.61	45.7±0.66	49.7±1.04	49.0±1.17	49.3±0.79	56.27±0.49	58.87±1.52	56.94±0.50
CG	46.0±2.21	47.5±0.75	46.9±0.99	52.87±1.09	52.8±1.08	52.84±0.75	57.22±1.39	58.5±0.91	58.0±0.78	67.52±.62	71.6±1.98	68.49±0.66
PG	48.5±2.20	54.6±1.19	52.1±1.26	58.5±1.45	57.8±1.59	58.19±1.06	65.3±0.97	65.42±1.12	65.3±0.75	77.8±0.75	75.7±2.07	77.77±0.70
FL	11.3±0.49	11.4±0.22	11.4±0.23	12.8±0.30	12.1±0.26	12.48±0.20	14.0±0.53	13.8±0.53	13.9±0.37	16.49±0.84	16.3±0.43	15.8±0.15
HL	1.68±0.32	1.88±0.20	1.8±0.17	2.8±0.70	3.0±0.24	2.9±0.35	4.5±0.63	5.42±0.65	5.0±0.46	7.14±0.43	13.1±1.60	8.44±0.53
EL	8.91±0.39	8.73±0.47	8.81±0.31	9.79±0.21	9.75±0.31	9.77±0.19	11.7±0.49	9.7±0.49	10.5±0.41	11.9±0.30	11.0±0.40	11.64±0.18
TL	6.82±0.44	7.13±0.31	7.0±0.26	7.27±0.33	8.38±0.52	7.84±0.32	8.78±0.46	8.92±0.36	8.8±0.28	9.48±0.19	9.65±0.34	9.50±0.16
B.wt	7.31±0.77	8.32±0.47	7.89±0.42	12.87±0.63	13.06±0.50	12.97±0.39	16.67±0.44	16.5±0.34	16.62±0.26	26.39±0.64	31.87±2.14	27.69±0.73

HW-Height at withers, BL- Body length, CG- Chest girth, PG- Paunch girth, FL- Face length, HL- Horn length, EL- Ear length, TL- Tail length, B.wt- Body weight

Table 2. Average body measurements of adult Long haired Sumi-Ne goats

Traits	Adults		
	Females (34)	Male (21)	Overall (55)
Body Height	45.71±0.61	48.43±1.52	46.75±0.71
Body Length	56.35±0.81	58.62±1.73	57.22±0.83
Chest Girth	68.71±1.03	71.24±2.21	69.67±1.06
Paunch Girth	77.44±1.40	75.71±2.20	76.78±1.20
Face Length	15.59±0.28	16.19±0.45	15.82±0.24
Horn Length	7.79±0.71	13.43±1.74	9.98±0.88
Ear Length	11.77±0.35	10.70±0.38	11.35±0.27
Tail Length	9.24± 0.23	9.71±0.29	9.42±0.18
Body Weight	25.79±1.05	31.48±2.45	28.22±1.26

Housing: Goat houses are made of mud, concrete, bamboo sticks and wooden logs with no proper arrangement of electric and water supply. Goat houses are made on the ground as well as on the elevated platform raised from the ground at 3-4 ft level (fig.5). A wooden ramp is made outside the house for entry and exit of the animals. The goat house with raised flooring help in keeping the house neat and clean as droppings and urine do not accumulate on the floor but come down the space below the floor of house. The raised flooring also provides good ventilation and prevents the animals from infections.

**Figure 5:** Types of goat house

Feeding: Goats depend on local vegetation available in the jungle. There are plenty of barren and fallow pastureland with plenty of wild grasses and other vegetation which are easily accessible to the goats.

**Figure 6:** Browsing and stall feeding

Goats can climb easily and browse in such difficult mountain slopes. Stall fed goats are kept on local grass, crushed maize and tree leaves (fig. 6). The animals love salt licking also.

Performance: Breeding in these goats is through natural mating. The litter size varies from 1 to 4 (

**Figure 7:** Singlet, triplet and Quadruplets

fig.7), twinning being very common, triplets rare but tetraplets are exceptions. The first kidding generally delivers singlet, however, the litter size increases in subsequent kiddings. Twinning was recorded in more than 50% cases. Age at first service in males is around one year whereas the age at first kidding varies from 15 to 18 months. The average gestation period like other goat breeds is about five months. Since these goats are reared mainly for meat purpose, the milk yield is very less (0.3 to 0.5 liters per day). The milk is not drawn but left for kids. The udder and teats are also not well developed.

Utility of goat hair: Goat hair obtained from the Sumi-Ne goats has commercial utility for the tribal people. It is used for beautification purpose in garments, ornaments and weaponry. The hair are processed locally and dyed using organic colour extracted from plants/flowers. The articles made with the use of goat hair are depicted in fig 8.



Figure 8: Utility of goat hair

CONCLUSION

Sumi-Ne goats is an important germplasm of Nagaland state having significant contribution in the livelihood of tribal people. The population of true to breed animals is about 8000. Since this goat population has been registered as new goat breed of the country, there is a need to propagate the population using the good genetically pure breed bucks. The breeding bucks can be raised at state goat farm and distribute to the farmers to enhance the goat population in the field. The genetic improvement and conservation of this breed is equally important and can be initiated simultaneously.

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