

Research Article

Battisi goat: a lesser known goat population of northern IndiaA.K. Mishra^{1*}, Amod Kumar¹, Reena Arora¹, Avnish Kumar Bhatia¹ and Avneesh Kumar²¹ICAR-National Bureau of Animal Genetic Resources, Karnal-132001, Haryana, India²DUVASU Mathura-281001, Uttar Pradesh, India**ABSTRACT**

The present study was undertaken to characterize a lesser-known goat population of Uttar Pradesh popularly known as Battisi. It is a dual type goat inhabiting Mathura district of UP and bordering areas of Rajasthan and Haryana. Battisi animals are medium to large in size. The white coat color with black or brown patches on face, abdomen and legs are the important characteristics of Battisi goat. The nose line is typical Roman type. Ears are medium to large in size and the length ranged from 8 to 25 cm. The average adult body weight of males and females' animals were 45.58 ± 4.19 and 35.68 ± 0.65 kg, respectively which varies from 38 to 61.4 kg in males and 28 to 48 kg in females. The overall body length, height, chest girth, face length, face width, ear length and tail were 71.73 ± 0.77 , 80.42 ± 0.76 , 79.83 ± 0.66 , 21.69 ± 0.23 , 14.12 ± 0.14 , 20.77 ± 1.14 and 13.79 ± 0.44 cm, respectively. Body weight of lambs in the age groups of 1-3, 3-6 and 9.12 months ranged between 7-33, 22-30 and 22-74 kg respectively. The goats are primarily maintained on grazing (extensive system) with zero input. Goat rearing constituted a vital component of livelihood security and economy of the farmers maintaining this goat population. Majority of the farmers have been rearing this population for more than 30-40 years. The primary study reveals that the Battisi goat is phenotypically different from other registered goat breeds of the region.

Key words: Battisi goat, Body biometry, Body weight, Phenotypic characterization***Corresponding author:** anilmishra65@gmail.com**INTRODUCTION**

Goat is an important species under the small ruminant category and India is gifted with rich diversity in goat genetic resources represented by 39 registered breeds (ICAR- NBAGR, 2023). These breeds are well adapted to different production systems of the country and play significant role in Indian agriculture. The characterization of goat genetic resources under zero non-descript mission of the country is the priority of ICAR – National Bureau of Animal Genetic Resource, Karnal. Apart from registered breeds, there are some populations which deserve to be registered as new breeds and Battisi is one of them which is popular in Mathura district of UP and bordering area of Rajasthan and Haryana. The present research work was undertaken to study the home tract, management practices, growth performance and production performance of Battisi goat.

MATERIALS AND METHODS

The present study was conducted in Mathura district of Uttar Pradesh in the month of February 2022. The body biometric traits viz. body weight (BW), body length (BL), height at wither (HW), chest girth (CG), paunch girth (PG), ear length (EL), face length (FL), face width (FW), and tail length (TL) of the Battisi goats were measured. The body weight was recorded using spring weighing balance and the biometric traits

were recorded using measuring tape. Information related to breeding and reproduction, management practices, diseases prevalence and mortality etc. were collected through interaction with the goat farmers on a proforma developed for phenotypic characterization of goat genetic resources of India. The morphological observations and morphometric traits were recorded as per the breed descriptor developed by ICAR- NBAGR. Various physical traits, coat colour pattern, head profile, ear orientation, production performance, reproduction management practices were collected by physical observation and interviewing goat farmers. The data were statistically analyzed using one way Analysis of Variance technique (Snedecor and Cochran, 1989).

RESULTS AND DISCUSSION

Battisi is a dual type goat population used for both its milk and meat, inhabiting Mathura district of UP and bordering area of Rajasthan and Haryana. Mathura, situated along the banks of the river. The climate of Mathura is tropical extreme having very hot summers with temperatures rising beyond 44 °C, and cold and foggy winters with the temperature dipping to 5 °C. The average rainfall is 793 mm, received mostly during the monsoons from July to September.

Battisi animals are medium to large in size (Fig.1 and 2). The white coat color with black or brown patches on face, chest, abdomen and legs are the important

characteristics of Battisi goat. The nose line is typical Roman type. The ears are medium to large in size and their length ranged from 8 to 25 cm, with pendulous orientation. The udder is medium sized and developed with medium teats. Majority of the farmers informed that they were rearing this population since 30-40 years.

The average body biometry of adult Battisi goat is given in Table 1. The average adult body weight of males and females' animals were 45.58 ± 4.19 and 35.68 ± 0.65 kg, respectively which varies from 38 to 61.4 kg in males and 28 to 48 kg in females. The overall body length, height, chest girth, face length, face width, ear length and tail were 71.73 ± 0.77 , 80.42 ± 0.76 , 79.83 ± 0.66 ,

21.69 ± 0.23 , 14.12 ± 0.14 , 20.77 ± 1.14 and 13.79 ± 0.44 cm, respectively. There is significant difference between male and female for all the biometric traits under study except ear length which are in accordance with some previous studies (Verma *et al.*, 2009, Sharma *et al.*, 2020). The body weight and body biometry of Battisi are higher than Barbari distributed in Mathura and Bundelkhandi goats (Verma and Mishra 2014) distributed in Bundelkhand region of Uttar Pradesh. Body weight of Battisi kids in the age groups of 1-3, 3-6 and 9-12 months ranged between 7-33, 22-30 and 22-74 kg respectively. The body weight and biometry of 6 months kids and adult animals showed that Battisi goat is ideal for chevon production.



Fig. 1: Battisi male



Fig. 2: Battisi female

Table 1: Body weight (kg) and biometry (cm) of adult Battisi goat

Traits	N	BW	BL	Height	CG	PG	FL	FW	EL	TL	HL
Overall	50	36.67 ± 0.82	71.73 ± 0.77	80.42 ± 0.76	79.83 ± 0.66	80.95 ± 0.74	21.69 ± 0.23	14.12 ± 0.14	20.77 $\pm$ 1.14	13.79 ± 0.44	12.40 ± 0.59
Sex		**	**	**	**	**	**	**	NS	**	**
Male	05	45.58 ± 4.19	78.74 ± 2.54	88.14 ± 2.49	86.61 ± 2.52	88.39 ± 1.63	24.63 ± 0.65	14.99 ± 0.25	22.54 $\pm$ 1.08	17.78 ± 0.40	20.07 ± 2.32
Female	45	35.68 $\pm$ 0.65	70.95 ± 0.73	79.56 ± 0.69	79.08 ± 0.59	80.12 ± 0.71	21.36 ± 0.19	14.03 ± 0.15	20.06 $\pm$ 1.15	13.34 $\pm$ 0.44	11.49 ± 0.43
Range M		38-61.4	71-86	83-97	82-96	83-93	22-26	14-15	20-25	16-19	14-25
F		28-48.5	62-80	69-100	72-91	71-91	17-25	11-15	8-25	5-17	5-19

** Significant at $p \leq 0.01$; NS = non-significant.

The average flock size is 41 (range: 11 to 120). The flocks consist of 433 Battisi and 3 other goats. Battisi goat flocks comprising 11 adult male, 24 adult females and 6 kids. According to majority of the farmers, rearing of the Battisi goat is only a source of income for their livelihood.

The goats are primarily maintained on grazing (extensive system). However, all the farmers provide concentrate to goats especially during breeding season, pregnant does, kids and during scarcity period.

Only 20% of farmers (Table 2) kept animals in open area and majority of farmers grazed their goat from 8 AM to 5 PM (9 hrs). The distance covered by majority of farmers was 4 to 6 km. The marketing age of male kids was reported as 3 -4 months by 50% goat farmers (Table 3). The cost of surplus kids was reported as ₹ 4000 to ₹ 5000 by 90% of the farmers. The cost of adult ewes was around 12000 to 15000. The average milk yield was approximately 3 kg with a lactation period of 90 days.

Table 2: Feeding and housing management practices adopted by Battisi goat farmers

Particulars	Items	% of farmers
Management	Extensive system	100%
Feeding	Concentrate and fodder supplementation	100%
Grazing: Distance travelled	4 to 6 Km	100%
Grazing hours Time: 8 AM to 5 PM	9 hrs	100%
Housing pattern		
Type of housing	Open	20% (2/10)
	closed	80%

Table 3: Marketing and disposal age and cost of live animals

Particulars	Items	% of farmers
Marketing age	< 3 months	30.0% (3/10)
	3 – 4 months	50.0% (5/10)
	> 4 months	20.0% (2/10)
Lamb cost at marketing age (₹)	3000/-	10.0% (1/10)
	4000 to 5000/-	90.0(9/10)
Adult cost/culled animals cost (₹)	Ewes: rearing	12000 – 14000/- (50%)
		14000-15000/- (50%)

The does are bred through natural service, the bucks per flock were observed to be 1.5 with a buck:doe ratio of 1:27.13. In all the studied flocks only Battisi bucks are being used for breeding purpose. The breeding males are either selected from their own flock or procured/exchanged with the other breeders. Some farmers also exchange their bucks after 2 to 3 years of use. The farmers selected breeding bucks based on body conformation and size, and use pure Battisi buck for breeding. The females show sexual maturity at about 8 to 10 months of age. The age at first mating in bucks was about 12 months as reported by majority of the goat breeders. The main kidding season is December to January. Twinning in this population was reported to be 40 to 90% by the farmers.

The present study reveals that Battisi goat is phenotypically different from other registered breeds of the region and farmers preferred them for mutton production. This new goat population may be considered for registration as a new goat breed of India.

ACKNOWLEDGEMENT

The authors are thankful to Director, ICAR-National Bureau of Animal Genetic Resources, Karnal for providing facilities and sincere gratitude to all goat

keepers for allowing measurements of their animals. We also sincerely thank the Director, Animal Husbandry, Govt. of Uttar Pradesh.

REFERENCES

- ICAR-NBAGR. 2023. <https://nbagr.icar.gov.in/en/breeds-registered-dec23/>.
- Sharma R, Vij PK, Aggarwal RAK, Chandran PC, Kamal Reena Kumari, Dey A, and Tantia MS. 2020. Characterization of a new potential goat breed (Palamu) from Jharkhand, India. *Indian Journal of Animal Sciences*, 90(12):1606 – 1611.
- Snedecor GW, and Cochran WG. 1989. *Statistical Methods*, 8th edn., Iowa State University Press, Iowa, USA.
- Verma NK, and Mishra Priyanka. 2014. Goat Genetic Resources of India: Bundelkhandi Gopat- an important germplasm of Bundelkhand region, published by ICAR-National Bureau of Animal Genetic Resources, Karnal – 132001, pp 18.
- Verma NK, Dixit SP, Dangi, Aggarwal RAK, Kumar S, and Joshi BK. 2009. Malabari goat: Characterization, management, performance and genetic variability. *Indian Journal of Animal Sciences*.