

Morphological Characterization of Bundelkhandi Goat Breeds and management strategies in Mahoba District

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ABSTRACT

The present study was conducted in Mahoba District of Bundelkhand region of Uttar Pradesh. This region is most suited for rearing of Bundelkhandi goat due to natural habitat and special survival and characterization the breeds. A sample of 240 farmers and their 566 buck and 1254 doe were randomly selected from all four blocks of Mahoba. The respondents were interviewed with the help of well structured interview schedule. The study covered age group wise and sex wise distribution, the group wise enumeration for goats 0 to 3 months, 3 to 6 months, 6-9 months, 9-12 months and above 12 months (adults) of the breed. Average body weight (Kg), body length (cm), body Height (cm). Maximum goat keepers 63.96 Per cent reared goats in semi-intensive system, 68.17 Per cent of accommodate their flocks in the (No house) own houses dwellings with the family member, mostly 74.36 Per cent is a grazing method utilized by farmers and 65.18 percent apply self medication in Mahoba. Semi-intensive systems can be profitable at rural areas in Mahoba.

Key words: Bundelkhandi goat, Mahoba, management practices, Rearing system.

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INTRODUCTION

Livestock sector plays an important role in rural economy of India. Goats are the most adaptable and geographically widespread livestock breeds and contribute significantly to rural economy when all other means of agriculture is a failure. The domestic goat (*Capra hircus*) is one of the oldest domesticated farm animals which provide multiple products like meat, milk, skin, fiber and manure. They efficiently survive on available crop residues, thorny shrubs and trees grown in low fertile lands where no other crops can be grown.

In India, goats are kept as a source of livelihood and additional income as well as insurance against natural disasters. Being, small in size, goats are easier to manage and require less space, easily handled even by children's and women's. Bundelkhand region of Uttar Pradesh is also most suited for goat rearing due to semi-arid climate, undulated topography, availability of thorny shrubs and trees as feed, etc. Bundelkhandi goats are widely domesticated in this region due to their special survival characters like hardy nature, long hair on body, long legs, bushy tail, large-sized and black-colored and narrow face and are able to survive in very low and high temperature in different seasons of this region. Keeping in view the present study was planned to evaluate the performance of Bundelkhandi goat under extensive, semi-intensive and intensive rearing management systems- in terms of morphological characterization and management practices in Mahoba district of Bundelkhand region of Uttar Pradesh.

MATERIAL AND METHODS

The research study was conducted in Mahoba district of Bundelkhand region of Uttar Pradesh due to availability of Bundelkhandi goat. For the survey regarding population of Bundelkhandi goats for breed's characterization included all the four blocks namely Jaitpur, Panwari, Charkhari and Kabrai of Mahoba. From each block 12 villages and 5 farmers from each village having up to 60 goats were randomly selected as sample. Thus, a total of 48 villages, 240 farmers and 1820 goats which comprised 566 buck and 1254 doe were selected as sample. For the collection of data from herd a tested schedule were used for the purpose of information collection in terms of morphological characterization and management practices in Mahoba. Tabular analysis technique was applied to data and derives meaningful findings. Statistical tools like mean, standard deviation, percentage, ratio and standard error for different traits were estimated with the help of RBD.

RESULTS AND DISCUSSION

Body Measurement

The parameters examined were body weight, body length and height at birth, 3 months, 6 months, 12 months and above 12 months were recorded.

Body weight

Body weight at 0-3 months of age

The mean body weight (kg) of 0-3 age male goat group of under the different rearing system as extensive, semi-intensive and intensive system 4.40 ± 1.18 , 4.57 ± 1.20 and 4.51 ± 1.22 kg, and female goat was 3.34 ± 1.16 , 4.09 ± 1.11 and 3.92 ± 1.10 kg, respectively Table 1.

Body weight at 3-6 months of age

The mean body weight (Kg) of 3-6 age male goat groups of 8.84 ± 1.12 , 9.42 ± 1.14 and 9.18 ± 1.16 and female goats was 7.59 ± 1.14 , 8.34 ± 1.19 and 8.02 ± 1.12 kg body weight respectively.

Body weight at 6-9 months of age

The mean body weight (kg) of 6-9 age male goat groups of 16.20 ± 1.18 , 18.26 ± 1.23 and 17.98 ± 1.17 kg, female goat was 14.88 ± 1.13 , 16.14 ± 1.17 and 15.81 ± 1.11 kg, respectively.

Body weight at 9-12 months of age

The mean body weight (kg) of 9-12 age male goats was 23.24 ± 1.14 , 25.08 ± 1.28 and 24.69 ± 1.29 kg, and female goat was 20.93 ± 1.16 , 22.72 ± 1.21 and 21.51 ± 1.14 kg, respectively.

Body weight at above 12 months of age

The mean body weights (Kg) of above 12 age male goat was 30.94 ± 1.20 , 32.24 ± 1.13 and 31.88 ± 1.16 kg, and female 26.59 ± 1.17 , 28.06 ± 1.18 and 27.17 ± 1.14 kg, respectively.

The findings were also higher than reports of Mandakmale *et al.* [8] in Kathewadi breed goat, Tyagi *et al.* (2015) for Surti goats. Higher body weights of male kids have also been reported in Jamunapari Rawat and Singh, [13]. Higher body weights in male kids are attributed to anabolic effect of male sex hormones, Hafez, [3].

Body length

Body length at 0-3 months of age

The mean body length (cm) of 0-3 age male goats group of under the different rearing system as extensive, semi-intensive and intensive system 33.10 ± 1.16 , 33.45 ± 1.12 and 33.28 ± 1.19 cm, and female was 30.21 ± 0.08 , 31.72 ± 1.16 and 31.51 ± 1.13 cm, respectively Table 2.

Body length at 3-6 months of age

The mean body length (cm) of 3-6 age male goats was 42.17 ± 1.10 , 43.18 ± 1.15 and 42.94 ± 1.14 cm, and female was 39.51 ± 1.17 , 40.04 ± 1.16 and 39.82 ± 1.11 cm, respectively.

Body length at 6-9 months of age

The mean body length (cm) of 6-9 age male goats was 51.92 ± 1.11 , 54.28 ± 1.13 and 53.13 ± 1.16 cm, and female was 47.76 ± 1.15 , 50.03 ± 1.19 and 49.94 ± 1.17 cm, respectively.

Body length at 9-12 months of age

The mean body length (cm) of 9-12 age male goats was 59.32 ± 1.19 , 61.86 ± 1.17 and 60.62 ± 1.14 cm and female was 53.47 ± 1.14 , 56.92 ± 1.12 and 55.79 ± 1.18 cm, respectively.

Body length at above 12 months of age

The mean body length (cm) of above 12 age male goat was 65.02 ± 1.10 , 68.26 ± 1.14 and 67.18 ± 1.17 cm, and female was 60.49 ± 1.15 , 65.89 ± 1.18 and 62.67 ± 1.11 cm, respectively.

The observed values were higher than the reports of mean body length by Kharkar *et al.* (2014) in berari goats, Mandakmale *et al.* (2016) in Kathewadi goat, the results were in close agreement with Shettar (2011). Dudhe *et al.* (2015) the estimates of Sirohi goat.

Body Height

Body Height at 0-3 months of age

The mean body height (cm) of 0-3 age male goat group of under the different rearing system as extensive, semi-intensive and intensive system 40.82 ± 1.67 , 42.08 ± 1.18 and 41.74 ± 1.12 cm, and female was 39.17 ± 1.04 , $40.86 \pm .96$ and 40.20 ± 1.17 cm, respectively.

Body Height at 3-6 months of age

The mean body Height (cm) of 3-6 age male goat was 49.05 ± 1.12 , 50.68 ± 1.20 and 49.84 ± 1.67 cm, and female was 47.67 ± 1.34 , 49.00 ± 1.02 and 48.12 ± 1.28 cm, respectively.

Body Height at 6-9 months of age

The mean body Heights (cm) of 6-9 age male goat was 55.98 ± 1.48 , 57.48 ± 0.85 and 56.75 ± 1.01 cm, and female was 54.49 ± 1.16 , 56.10 ± 1.46 and 55.23 ± 1.64 cm, respectively.

Body Height at 9-12 months of age

The mean body Height (cm) of 9-12 age male goats was 62.58 ± 1.36 , 63.96 ± 1.44 and 63.00 ± 1.58 cm, and female was 60.86 ± 1.17 , 62.14 ± 1.85 and 61.25 ± 1.87 cm, respectively.

Body Height at above 12 months of age

The mean body Heights (cm) of above 12 month age male goat was 70.05 ± 1.19 , 71.85 ± 1.20 and 70.93 ± 1.83 cm, and female was 67.77 ± 1.95 , 69.92 ± 1.58 and 68.81 ± 1.10 cm, respectively.

The observations of height in Bundelkhandi goats were found to be higher than various earlier reports viz; Kharkar *et al.* [6] reported that the berari goats. Mandakmale *et al.* [8] in Kathewadi breed of goat, Dudhe *et al.* [2] the estimate of Sirohi goat.

Management Practices

Rearing System

Table 4 shows the rearing systems of Bundelkhandi goats in Mahoba district was Maximum goat keepers 63.96 Per cent reared goats in semi-intensive system, followed 28.34 Per cent extensive system of rearing and 7.70 Per cent respondent followed intensive system of rearing. The reason less respondent of intensive system or rearing might be the initial high cost involvement and lack of knowledge about scientific goat rearing. Nearly similar result found that Islam [4], Stone [21] and with agreement Sakthivel *et al.* [17] and Jana *et al.* [4] reported that semi intensive system, respectively.

Housing practices

Table. 5 shows the housing systems of Bundelkhandi goats in Mahoba district was 29.24 per cent of respondents followed kachcha house while 2.59 per cent respondents kept their animals in the pucca house. Most of the respondents 68.17 Per cent of accommodate their flocks in the (No house) own houses dwellings with the family member. Flocks are kept in house at night and during the day when the heat intensity is high. The major reason for housing flocks at night with the family is to minimize attack by predators and to avoid theft. Similar observation was made by Sorathiya *et al.* [20], Dana *et al.* [1], Tudu *et al.* [23], Mohan *et al.* (2015) goats kept under Kaccha house, Similar findings were also reported by in Bundelkhand region Singh *et al.* [19]. Rawat and Singh [13] In mahoba goats were kept mostly in human dwellings,

Feeding systems

Three feeding systems namely stall feeding; Tethering and grazing were applied for three different groups of goats in Mahoba Table 6. Grazing goat keeping seems to be important for farmers in Mahoba. The first is a grazing method utilized by farmers 74.36 Per cent. Similar finding found that the Tanwar and Khem Chand [22 and Yadav and Tailor [25]. 7.24 Per cent farmers use a Stall feeding system. Similar observation was made by Lavania *et al.* (2014). Singh *et al.* [18] and Rawat and Singh [13] in mahoba. The third tethering system is a mix of the two, both grazing and stall feeding (intensive and extensive) used by farmers 18.40 Per cent. Patra [12] and Nandi *et al.* [12].

Health management

Table 7 shows the Households apply various methods of treatments for their flocks with health problems. 65.18 percent respondents apply Self medication (traditional treatments) using different parts of various plants (leaves, stems, roots), water, kerosene, soil and local extractions mixed in varying proportions or alone for different diseases and parasites and

flock structures. Respondents of 23.57 Per cent take their sick flocks to veterinary centers. Less adequately, flocks of about 11.25 Per cent respondents received vaccination. The results indicate the lack of awareness, less veterinary services and financial problem among the goat farmers about the proper hygienic measures to be adopted to be taken the goats. Similarly results were found by Dana et al. [1], Mohan et al. [9], Samuel et al. [16], Muhammad et al., [10], Lavania et al. [7] reported that in Rajasthan, Sabapara et al. [14] in Gujarat.

TABLE:1 Body weight (Kg) of Bundelkhandis goat in Mahoba district

Body Weight (Goats)			System						Statistical analysis	Critical difference
			Extensive		Semi-Intensive		Intensive			
Age (Month)	Sex	Total No	No	Mean	No	Mean	No	Mean		
0-3	Male	52	28	4.40±1.18	20	4.57±1.20	4	4.51±1.22	NS	-
	Female	69	37	3.34±1.16	26	4.09±1.11	6	3.92±1.10	*	0.21
3-6	Male	78	43	8.84±1.12	30	9.42±1.14	5	9.18±1.16	NS	-
	Female	148	72	7.59±1.14	67	8.34±1.19	9	8.02±1.12	*	0.68
6-9	Male	117	54	16.20±1.18	49	18.26±1.23	14	17.98±1.17	*	1.49
	Female	179	96	14.88±1.13	73	16.14±1.17	10	15.81±1.11	NS	-
9-12	Male	138	78	23.24±1.14	50	25.08±1.28	10	24.69±1.29	NS	-
	Female	232	124	20.93±1.16	96	22.72±1.21	12	21.51±1.14	NS	-
Above 12	Male	181	98	30.94±1.20	74	32.24±1.13	9	31.88±1.16	NS	-
	Female	626	370	26.59±1.17	225	28.06±1.18	31	27.17±1.14	NS	-
Total		1820	1000		710		110			

*Significant at 5% level (p<0.05), NS= non-significant

TABLE: 2 Body Length (cm) of Bundelkhandi goat in Mahoba district

Body Length (cm.)			System						Statistical analysis	Critical difference
			Extensive		Semi-Intensive		Intensive			
Age (Month)	Sex	Total No	No	Mean	No	Mean	No	Mean		
0-3	Male	52	28	33.10±.16	20	33.45±.12	4	33.28±.19	NS	-
	Female	69	37	30.21±.08	26	31.72±.16	6	31.51±.13	*	1.44
3-6	Male	78	43	42.17±.10	30	43.18±.15	5	42.94±.14	NS	-
	Female	148	72	39.51±.17	67	40.04±.16	9	39.82±.11	NS	-
6-9	Male	117	54	51.92±.11	49	54.28±.13	14	53.13±.16	NS	-
	Female	179	96	47.76±.15	73	50.03±.19	10	49.94±.17	NS	-
9-12	Male	138	78	59.32±.19	50	61.86±.17	10	60.62±.14	NS	-
	Female	232	124	53.47±.14	96	56.92±.12	12	55.79±.18	*	2.91
Above 12	Male	181	98	65.02±.10	74	68.26±.14	9	67.18±.17	NS	-
	Female	626	370	60.49±.15	225	65.89±.18	31	62.67±.11	*	3.74
Total		1820	1000		710		110			

*Significant at 5% level (p<0.05), NS= non-significant

TABLE: 3 Body Height (Height at withers) (cm) of Bundelkhandi goat in Mahoba district

Body Height (Height at withers) (cm)			System						Statistical analysis	Critical difference
			Extensive		Semi-Intensive		Intensive			
Age (Month)	Sex	Total No	No	Mean	No	Mean	No	Mean		
0-3	Male	52	28	40.82±1.67	20	42.08±1.18	4	41.74±1.12	NS	-
	Female	69	37	39.17±1.04	26	40.86±.96	6	40.20±1.17	*	1.46
3-6	Male	78	43	49.05±1.12	30	50.68±1.20	5	49.84±1.67	NS	-
	Female	148	72	47.67±1.34	67	49.00±1.02	9	48.12±1.28	NS	-
6-9	Male	117	54	55.98±1.48	49	57.48±0.85	14	56.75±1.01	NS	-
	Female	179	96	54.49±1.16	73	56.10±1.46	10	55.23±1.64	*	1.68
9-12	Male	138	78	62.58±1.36	50	63.96±1.44	10	63.00±1.58	NS	-
	Female	232	124	60.86±1.17	96	62.14±1.85	12	61.25±1.87	NS	-
Above 12	Male	181	98	70.05±1.19	74	71.85±1.20	9	70.93±1.83	NS	-
	Female	626	370	67.77±1.95	225	69.92±1.58	31	68.81±1.10	*	2.13
Total		1820	1000		710		110			

*Significant at 5% level ($p < 0.05$), NS= non-significant

TABLE: 4 Rearing System of Bundelkhandi in Mahoba

Rearing System	Frequency	Percentage
Intensive system	18.48	7.70
Semi intensive system	153.50	63.96
Extensive system	68.02	28.34

GRAPH:1 Rearing System of Bundelkhandi goats in Mahoba

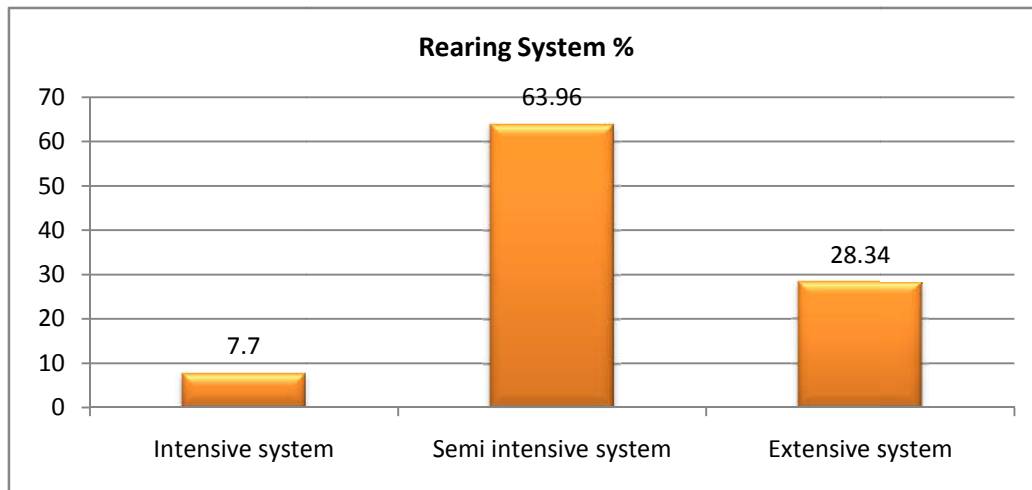


TABLE: 5 Housing practices of Bundelkhandi goats in Mahoba

Housing practices	Frequency	Percentage
No house (own house)	163.60	68.17
Kachcha	70.18	29.24
Pucca	6.22	2.59

GRAPH: 2 Housing practices of Bundelkhandi goat farmers in Mahoba

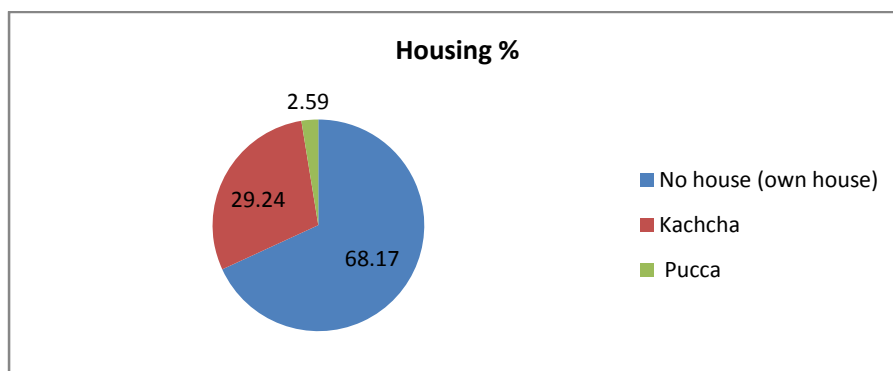


TABLE: 6 Feeding systems of Bundelkhandi goats in Mahoba

Feeding systems	Frequency	Percentage
Tethering	44.16	18.40
Grazing	178.46	74.36
Stall feeding	17.38	7.24

GRAPH: 3 Feeding systems of Bundelkhandi goats in Mahoba

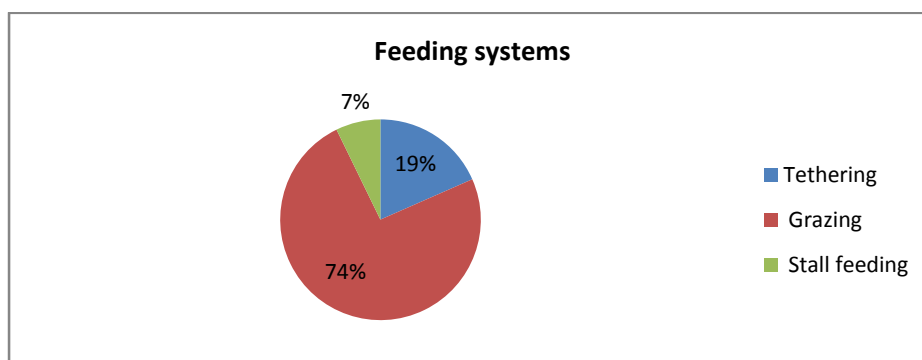
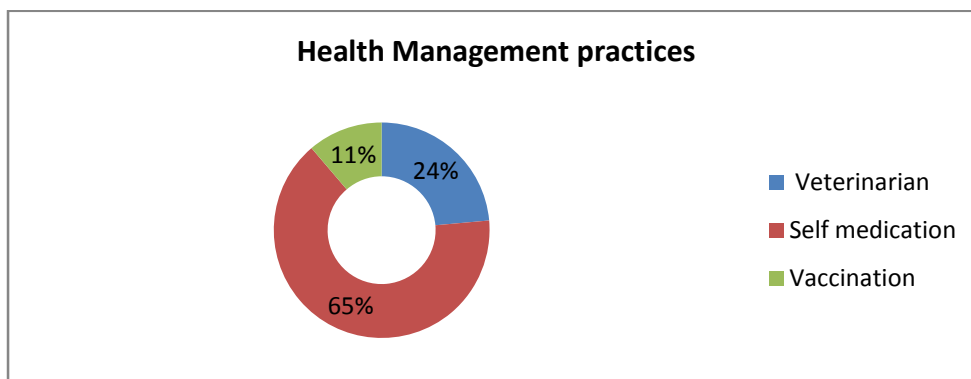


TABLE: 7 Health Management practices of Bundelkhandi goats in Mahoba

Health Management practices	Frequency	Percentage
Veterinarian	56.57	23.57
Self medication	156.43	65.18
Vaccination	27.00	11.25

GRAPH: 3 Health Management practices of goat in Mahoba



CONCLUSION

Semi-intensive systems perform better than intensive and extensive system in Mahoba District. Average body weight (Kg), body length (cm) and body Height (Height at withers) (cm) was higher under semi-intensive condition than extensive condition; it may be due to concentrate feeding, more grazing and also good management system. The observed values for body weights in the present study are an indication that Bundelkhandi goats have a good genetic potential for growth and have the ability to produce good quantity of meat.

As extensive system goats did not receive any feed supplements, their growth was lower than in semi-intensive system goats and thus, these goats showed a lower body weight with advancement of age. The reason less respondent of intensive system or rearing might be the initial high cost involvement and lack of knowledge about scientific goat rearing. Semi-intensive systems can be profitable at rural areas in Mahoba, which may help in improved economical condition and alleviating poverty.

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