

Performance of Bundelkhandi Goat in Terms of Productive and Reproductive Traits in Mahoba District of Uttar Pradesh

Sudhir Kumar Rawat¹, Sarju Narain² and S.P. Tyagi³

1. Scientist (Animal Husbandry), K. V. K. Mohoba, U.P., 2. Assistant Professor, Agril. Ext. Brahmanand PG College, Rath, Hamirpur, 3. Professor & Head, Deptt. of A.H. & Dairying, C.S.A.U.A.T. Kanpur, UP

Corresponding author e-mail: sudhirkvk@gmail.com

Paper Received on November 16, 2016, Accepted on January 12, 2017 and Published Online on January 28, 2017

ABSTRACT

The present study was purposively conducted in Mahoba District of Bundelkhand region of Uttar Pradesh during 2016. This region is most suited for rearing of Bundelkhandi goat due to natural habitat and special survival characteristics in the species. A sample of 240 farmers and their 566 buck and 1254 doe were randomly selected from all four blocks. The respondents were interviewed with the help of well structured interview schedule. The findings revealed that daily milk yield per day, lactation length (days), total lactation milk yield (l.), gestation length, number of kidding, number of kids (litter size) and sex ratio were higher under semi-intensive condition than intensive and extensive condition, while average age of first kidding, kidding interval and mortality rate were observed higher under extensive system than intensive and semi-intensive condition. The possible explanation for higher production, reproduction and profit of semi-intensive system than intensive and extensive systems were due to better feeding, proper grazing, control of mortality and diseases with better health care and good management practices followed by goat keepers. Thus, semi-intensive system was observed as profitable in rural areas of Mahoba.

Key words: Bundelkhandi goat; Rearing system; Performance; Reproductive and Productive traits;

Livestock sector plays most viable role in the economy of India. Goats are the most adaptable and geographically widespread livestock species 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/manmade disasters. Being small in size, goats are easier to manage and require less space, easily handled even by children and women. India has 135.17 million goats constituting 26.40 per cent of the total goats of the world and stands first in position. In India they produced 4.9 million tons of milk which constitutes 4 per cent of the total milk; 5.9 million tons of meat which constitutes

around 16% of total meat apart from skin and *Pashmina* (GOI, Livestock census, 2012).

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. (Mishra et al. 2012). Keeping in view the present study was planned to evaluate the performance of Bundelkhandi goat under extensive (goats graze 8-9 hrs/day over large area of marginal lands with little management), semi-intensive (combination of intensive and extensive system in which limited free range grazing is allowed with stall feeding) and intensive (stalls feeding on cultivated fodders and concentrates to meet their requirements.) rearing

management systems- in terms of Productive and Reproductive parameters in Mahoba district of Bundelkhand region of Uttar Pradesh.

METHODOLOGY

The research study was purposively conducted in Mahoba district of Bundelkhand region of Uttar Pradesh due to availability of Bundelkhandi goat and our working area as experts. For the purposive survey regarding population of Bundelkhandi goat for breed characterization included all four blocks of district namely Jaitpur, Panwari, Charkhari and Kabrai. 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 their 1820 goats which comprised 566 buck (male goat) and 1254 doe (female goat) were selected as sample. For the collection of data from tested schedule were used for the purpose of information collection in terms of productive and reproductive traits. Tabular analysis technique was applied to classify data and derive meaningful findings. Statistical tools like percentage, ratio and critical difference for different traits were estimated with the help of RBD.

RESULTS AND DISCUSSION

Productive Parameters of Bundelkhandi goats: The Productive Parameters considered for the assessment of productive performances of doe were as daily milk yield, lactation length and total lactation yield of Bundelkhandi goats in Mahoba as shown in Table 1.

Daily Milk yield: Fortnightly milk recording was done at the farmers' house/herd in the adult lactating goats in the morning and evening and the milk yield per day under extensive, semi-intensive and Intensive system were found 510.19±21.62 ml, 580.36±10.54 ml and 552.24±12.47 ml respectively. Daily milk yield per day was observed higher in the semi-intensive than extensive system. There was no significant difference found between the each other. Prasad et al. (2013),

Bhowmik et al. (2014) and Singh et al. (2013) were also recorded similar results.

Lactation length: The average lactation length ranged between 80 and 120 days in most lactating goats. The average lactation length was estimated in under extensive System, semi-intensive and Intensive is 84.72±12.61, 108.24±6.79 and 96.65±5.14 days respectively. Lactation length was observed higher in the semi-intensive than extensive system. The difference were found to be significant ($p < 0.05$, CD = 10.68) effect. Further consideration of CD showed that the lactation length of semi-intensive, extensive and intensive differed significantly from each other. Similar results were also reported by Bhowmik et al. (2014), Kharkaret et al. (2014) and Singh et al. (2013).

Total Lactation yields: Total lactation milk yield in under extensive System, semi-intensive and Intensive system are 43.22±9.57 liters, 62.82±4.38 liters and 53.37±6.43 liters respectively. Total lactation milk yield was observed higher in the semi-intensive than extensive system. The difference were found to be significant ($p < 0.05$, CD = 7.31) effect. Further consideration of CD showed that the total lactation milk yield of semi-intensive, extensive and intensive system differed significantly from each other. Kharkaret et al. (2014), Prasad et al. (2013), Singh et al. (2013) are also reported similar results.

Total lactation milk yield was observed higher in the semi-intensive than extensive system due to grazing, feed ration and better management. Differences in management and nutritional status of the does might be responsible for variation in total lactation yield in this study. Poor nutrition in late pregnancy in addition to reduced weight and vigour of kids at birth can delay the onset of lactation. Moreover, consumption of milk by kids during lactation in scavenging production system may influence total yield of milk.

Reproductive Parameters of Bundelkhandi goats: The traits considered for the assessment of reproductive performances of doe were as age at first kidding (days),

Table: 1 Productive Parameters of Bundelkhandi doe in Mahoba (N=1254)

Parameter	System			Statistical Analysis-RBD	Critical Difference
	Extensive	Semi-Intensive	Intensive		
Daily milk yield (ml)	510.19±21.62	580.36±10.54	552.24±12.47	NS	-
Lactation length (day)	84.72±12.61	108.24±6.79	96.65±5.14	*	10.68
Total lactation yield (l)	43.22±9.57	62.82±4.38	53.37±6.43	*	7.31

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

number of kidding, kidding interval (days), number of kids, gestation length (days), mortality rate and sex ratio. Collected and analyzed data are presented in Table 2.

Age at first kidding: The average age at first kidding in Bundelkhandi doe was 670 ± 22.34 days under extensive condition, 610 ± 30.12 days under semi-intensive condition and 643 ± 25.42 days under intensive system. Age at first kidding was observed lowest in the semi-intensive than extensive condition system. There was no significant difference between each other. Similar results were also found by *Bhowmik et al. (2014)*, *Dana et al. (2015)* and *Dhara et al. (2016)*.

Number of kidding: Number of kidding of Bundelkhandi goats was 10.37 ± 2.1 , 11.5 ± 1.2 and 11.0 ± 1.6 under extensive, semi-intensive and Intensive system, respectively. Number of kidding of Bundelkhandi goat was higher under semi-intensive system than extensive system. However, on statistical analysis, the differences in these systems were found to be non-significant. This result was also supported by the findings of *Kidaneet al. (2014)* and *Asefa et al. (2015)*.

Kidding Interval: Average kidding interval was 328 ± 10.52 days under extensive system, 295 ± 26.48 days under semi-intensive system and 310 ± 20.68 days under intensive system. Average kidding interval was lower under semi-intensive system than extensive system. However, on the basis of statistical analysis, the differences in these systems were found to be non-significant. Similar findings were reported to be *Bhowmik et al. (2014)* and *Dhara et al. (2016)*.

Number of kids (Litter size): In the present study the average Number of kids (Litter size) found was 1.29 ± 0.17 days under extensive system, 1.47 ± 0.13 days under semi-intensive system and 1.40 ± 0.11 days under

intensive system. Average Number of kids were higher under semi-intensive system than extensive system. The difference were found to be significant ($p < 0.05$, $CD = 0.11$) effect. On consideration of CD showed that the number of kid in semi intensive group was higher than the extensive system and intensive system at par to semi-intensive. Similar results were found that the *Miahet al. (2016)*, *Dana et al. (2015)* and *Hasan et al. (2015)*.

Gestation Length: Average gestation length was a 149 ± 2.46 days under extensive systems, 146 ± 2.13 days under semi-intensive systems and 147 ± 3.48 days under intensive system. Average gestation length was lower under semi-intensive system than extensive system. However, on statistical analysis, the differences in these systems were found to be non-significant. Similar results found that the *Bhowmik et al. (2014)*, *Miahet al. (2016)* and *Dhara et al. (2016)*.

Mortality rate: Average mortality was 15.25 ± 2.29 , 11.07 ± 4.12 and 13.36 ± 3.40 per cent under extensive, semi-intensive and intensive system, respectively. Mortality rate of goat was higher under extensive system than semi-intensive system. Further consideration of CD showed that the mortality rate of extensive, semi-intensive and intensive system differed significantly from each other. Similar results found that the *Paul (2012)*, *Prasad et al. (2013)*, *Singh et al. (2013)* and *Hasan et al. (2012)*.

Sex ratios: The sex ratio of male kid was 51.82 ± 2.45 , 57.34 ± 1.54 and 55.47 ± 1.71 under extensive, semi-intensive and Intensive condition. Sex ratio of male Bundelkhandi goat was higher under semi-intensive condition than extensive condition. However, on statistical analysis, the differences in these systems were found to be non-significant. The sex ratio of female kid

Table: 2 Reproductive Parameters of Bundelkhandi Goat in Mahoba

Parameter	System			Statistical Analysis-RBD	Critical Difference
	Extensive	Semi-Intensive	Intensive		
Age at first kidding	670 ± 22.34	610 ± 30.12	643 ± 25.42	NS	-
Number of kidding	10.37 ± 2.1	11.5 ± 1.2	11.0 ± 1.6	NS	-
Kidding interval	328 ± 10.52	295 ± 26.48	310 ± 20.68	NS	-
Number of kids	1.29 ± 0.17	1.47 ± 0.13	1.40 ± 0.11	*	0.11
Gestation length	149 ± 2.46	146 ± 2.13	147 ± 3.48	NS	-
Mortality	15.25 ± 2.29	11.07 ± 4.12	13.36 ± 3.40	*	1.43
Male	51.82 ± 2.45	57.34 ± 1.54	55.47 ± 1.71	NS	-
Female	48.18 ± 3.11	42.66 ± 2.62	44.53 ± 1.83	*	4.17

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

was 48.18 ± 3.11 , 42.66 ± 2.62 and 44.53 ± 1.83 under extensive, semi-intensive and Intensive condition. Average sex ratio of female kid was higher under extensive system than semi-intensive system. The difference were found to be significant ($p < 0.05$, CD = 4.17) effect. On consideration of CD showed that the female kids sex ratio of extensive system higher than the semi intensive system and intensive system at par to extensive system. Therefore, from the above results it may suggest that the variation of sex ratio was not due to breed of goat. Similar results were found by Hasan (2012) in Black Bengal goats in Bangladesh were 56:44 under semi-intensive condition and 55: 45 under extensive condition.

CONCLUSION

Semi-intensive systems perform better than intensive and extensive system in case of Bundelkhandi goat in Mahoba District. The possible explanation for higher production and reproduction among semi-intensive systems was due to better feeding, proper grazing, control of mortality and diseases with better health care and good management practices followed by goat keepers. Semi-intensive systems can be profitable at rural areas in Mahoba. This study can be beneficial for those who are interested to establish goat farm in the rural areas in Mahoba, which may help in improved economical condition and alleviating poverty.

REFERENCES

- Asefa, B., Kebede, K. and Effa, K. (2015). Assessment of production and reproduction system of indigenous goat types in Bale Zone, Oromia, Ethiopia. *Academia Journal of Agricultural Research*, **3** (12): 348-360.
- Bhowmik, N., Mia, M. M., Rahman, M. M. and Islam, S. (2014). Preliminary Study on Productive and Reproductive Performances of Jamunapari, Black Bengal and Crossbred Goats at Chittagong Region of Bangladesh. *Iranian Journal of Applied Animal Science*, **4** (1): 89-93.
- Dana, S.S., Kaul, P.N., Bandyopadhyay, U.K. and Ghosh, A. (2015). Goat production practices of santal tribe for improving their socio-economic condition and household nutrition. *Indian Journal of Animal Sciences*, **85** (10) : 1123–1125
- Dhara, K. C., Ray, N., Bandyopadhyay, P. K., Biswas, S. and Goswami, A. (2016) Influence of Gastrointestinal Parasites on Productive and Reproductive Performances of Black Bengal Goat under Farm Condition. *International Journal of Livestock Research*, **6** (2) : 25-36.
- Government of India (2012). Livestock Census, Directorate of Economics and Statistics, Ministry of Agriculture, New Delhi.
- Hasan, J. (2012). Reproductive Performance of Black Bengal Goat under Semi-Intensive and Extensive Condition in Rajshahi District, Master of Science Bangladesh Agricultural University, Mymensingh.
- M. J., Ahmed, J. U., Alam, M. M., Liaquat, M., Mojumder, O. and Ali, M. S. (2015). Reproductive performance of Black Bengal goat under semi-intensive and extensive condition in Rajshahi district of Bangladesh. *Asian J. Med. Biol. Res.*, **1** (1), 22-30
- Kharkar Hasan, K., Kuralkar, S. V. and Kuralkar, P. (2014) Growth, production and reproduction performance of berari goats in their native tract, *Indian Journal of Small Ruminants*, **20** (1):12-15
- Kidane, A., Melaku, S. and Haile, A. (2014). Characterization of goat population and breeding practices of goat owners in gumara-maksegnit watershed-north Gondar, Ethiopia. *Agriculture journal*, **9** (1): 5-14
- Miah, G., Das, A., Bilkis, T., Momin, M. M., Uddin, M. A., Alim, M. A., Mahmud, M. S. and Miazi, O. F. (2016). Comparative Study on Productive and Reproductive Traits of Black Bengal and Jamnapari Goat under Semi-Intensive Condition. *Scientific Research Journal*, **4**:2 :1-7.
- Mishra, P., Ali, A. S. and Verma, N. K. (2012). Phenotypic, biometric and genetic characterization of Bundelkhandi goats. *Indian Journal of Animal Sciences*, **82** (11): 1442–1445
- Paul, C. R. (2012). Studies on production and reproduction parameters of Black Bengal Goat. M.Sc Thesis, Department of Animal Breeding and Genetics, Bangladesh Agricultural University, Mymensingh.
- Prasad, R., Singh, A.K. and Singh, L. (2013). Economic viability of goat breed improvement programme (Barbari × non-descript) at farmer's flock in Uttar Pradesh. *Indian Journal of Animal Sciences*, **83** (6): 656–660.
- Singh, M. K., Dixit, A. K., Roy, A. K. and Singh, S. K. (2013). Goat Rearing: A Pathway for Sustainable Livelihood Security in Bundelkhand Region. *Agricultural Economics Research Review*, **26**: 79–88.