

*Original Research***Feeding Management Practices of Goats Adopted By Pantja Goat Keepers in Tarai Region of Uttarakhand****B. S. Khadda*, Brijesh Singh, D. V. Singh, S. K. Singh, C. B. Singh, J. L. Singh, D. S. Bisht and Aashaq Hussain Dar**

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Rec. Date:	Aug 14, 2017 16:50
Accept Date:	Feb 20, 2018 15:57
DOI	10.5455/ijlr.20170814045008

Abstract

A bench mark survey was conducted to collect the base line information from the Pantja goat rearers regarding to various feeding management practices with special reference to Pantja goats under field condition of Udham Singh Nagar and Nainital districts of Tarai region of the Uttarakhand during a period of two year (April, 2015 to March, 2017). The results of present study revealed that maximum goat rearers (65.58%) adopted semi stall feeding system and grazing was done mostly on community land (95.97%). The dry fodder was provided by majority (65.12%) of the goat rearers in summer season followed by 45.43% in rainy and 33.33% in the winter seasons in the surveyed area. Majority of goat keepers (79.22%) fed concentrate to all goats. The maximum goat rearers (78.24 %) provided concentrate to the goats during morning time and 89.24% fed concentrate to the goat as such. Majority of goat keepers (88.68%) practised special feeding to the female goats post kidding. Only 10.85 and 39.38 per cent goatherds fed mineral mixture and common salt supplements, respectively to the goats regularly. It can be concluded from the study that the scientific feeding practices are generally not followed by most of the farmers. Creation of awareness regarding scientific feeding practices will help in improving the productivity of goats and income of the farmers.

Key words: Concentrate, Feeding Management, Green Fodder, Goat Keepers, Mineral Mixture

How to cite: Khadda, B., Singh, B., Singh, D., Singh, S., Singh, C., & Singh, J., Bisht, D. & Dar, A. (2018). Feeding Management Practices of Goats Adopted by Pantja Goat Keepers in Tarai Region of Uttarakhand. International Journal of Livestock Research, 8(7), 109-115. doi: 10.5455/ijlr.20170814045008

Introduction

Livestock sector plays an important role in the national economy and in the socio-economic development of the country. The contribution of livestock sector to the national economy in terms of Gross Domestic Product is 3.9 per cent at current prices (BAHFS, 2013). Goats have been an integral component of

India's livestock economy, hence development of goat production is considered to be a pathway for inclusive agricultural growth as out of 138 million operational holdings, the small and marginal holdings (below 2.00 ha) together constituted 85% (GOI, 2014) and these holdings are the main custodian (> 75% of total goat population). There is significant growth in population of goats across the agro-climatic regions in India.

Feeding management is one of the most important area which needs an in depth probe because the whole gamut of goat rearing and their economic feasibility depends much upon the availability of feed and fodder and type of feed offered by the goat keepers to the goats. Given the genetic potential of the goats, its production depends mostly on the managerial practices, which exhibits high variation across agro-climates. Understanding the goat management practices followed by goat keepers is necessary to identify the strengths and weaknesses of the rearing systems and to formulate suitable intervention policies. Keeping in view, above a study was conducted to find out the existing feeding management practices followed by Pantja goatherds in *Tarai* region of Uttarakhand.

Materials and Methods

A bench mark survey was conducted to collect the base line information from the Pantja goat rearers regarding to various breeding management practices with special reference to Pantja goats under field condition of Udham Singh Nagar and Nainital districts of *Tarai* region of the Uttarakhand during a period of two year (April, 2015 to March, 2017). Multistage sampling method was adopted for the selection of respondents. Four clusters (Bhimtal, Tilpuri, Bara and Kunda) were selected from two districts (Udham Singh Nagar and Nainital). Total one hundred thirteen villages were surveyed on the basis of availability of Pantja goats. An individual farmer rearing Pantja goats formed the unit of a sample. A list of goat rearing families of the selected villages was prepared with the help of village Pradhan and Patvari and mostly all Pantja goat rearers were selected for survey from each village. Thus 645 selected respondents were interviewed and the desired information was collected. The data were collected by personal interview techniques through an interview schedule by administering a developed questionnaire and also by direct observation in the farmer's flocks. Before administering interview schedule to the sample subjects, specific objectives and the purpose of the survey was explicitly explained. The questions in the schedule were presented to them in their own dialect ensuring than they perceive the questions correctly. The existing management practices relating to feeding management were separately enlisted. Personal particulars of the respondents included name, category, age, village; Tehsil, religion, main occupation, education, number of family members, etc. were recorded. Feeding management is the most critical input in goat production. The following information was incorporated in the survey schedule pertaining to feeding practices regarding mode of feeding, grazing period, grazing site, green and dry fodder feeding,

tree lopping, concentrate feeding and feeding of mineral mixture and common salt, etc. The responses to each of the question in the schedule were coded and tabulated respondent wise in a master sheet. The qualitative data were quantified accordingly and tabulated to draw meaningful inferences. Therefore, appropriate tables were prepared, keeping in view the specific objectives of the study. The collected data were subjected to basic statistical analysis as per Snedecor and Cochran (1994). Chi Square (χ^2) was used to observe the effect of districts on different goat management practices.

$$\chi^2 = \sum_{i=0}^p \sum_{j=1}^q \frac{(O_{ij} - E_{ij})^2}{E_{ij}} \sim \chi^2, (p-1)(q-1)$$

Where, statistic χ^2 has $(p-1)(q-1)$ d.f.; E_{ij} is the expected frequency corresponding to i^{th} , and j^{th} cell; O_{ij} is the observe frequency

Results and Discussion

The data related to existing feeding management practices followed by goat keepers are presented in Table 1.

Table 1: Feeding management practices followed by goat keepers district wise

Particulars	District U. S. Nagar (N=372)	Nainital (N=273)	Overall (N=645)	χ^2 $\varsigma\alpha\lambda\upsilon\epsilon$
Mode of feeding				
Stall	9(2.42)	3(1.10)	12(1.86)	1.697
Semi stall	240(64.52)	183(67.03)	423(65.58)	
Grazing	123(33.06)	87(31.87)	210(32.56)	
Grazing period				
a. Winter season				
< 4 hrs	166(44.95)	133(48.73)	299(46.36)	1.104
5-8 hrs	187(50.27)	128(46.87)	315(48.84)	
>8 hrs	19(5.11)	12(4.40)	31(4.81)	
b. Summer season				
< 4 hrs	26(6.99)	17(6.23)	43(6.67)	0.769
5-8 hrs	295(79.30)	224(82.05)	519(80.46)	
>8 hrs	51(13.71)	32(11.72)	83(12.87)	
c. Rainy season				
< 4 hrs	66(17.74)	41(15.01)	107(16.59)	1.08
5-8 hrs	244(65.59)	181(66.30)	425(65.89)	
>8 hrs	62(16.67)	51(18.68)	113(17.52)	
Grazing site				
Own land	10(2.69)	16(5.86)	26(4.03)	4.097*
Community land	362(97.31)	257(94.14)	619(95.97)	
Dry fodder fed during				
a. Winter season				
Yes	128(34.41)	87(31.87)	215(33.33)	0.457
No	244(65.59)	186(68.13)	430(67.67)	
b. Summer season				
Yes	249(66.94)	171(62.64)	420(65.12)	1.281
No	123(33.06)	102(37.36)	225(34.88)	
c. Rainy season				

Yes	177(47.58)	116(42.49)	293(45.43)	1.645
No	195(52.42)	157(57.51)	352(54.57)	
Mode of dry fodder feeding				18.250**
Chaffed	106(42.57)	56(32.75)	162(38.57)	
As Such	49(19.68)	66(38.60)	115(27.38)	
Both	94(37.75)	49(28.65)	143(34.05)	
Green fodder fed during				
a. Winter season				
Yes	245(65.86)	186(68.13)	431(66.82)	0.366
No	127(34.14)	87(31.87)	214(33.18)	
b. Summer season				1.505
Yes	249(66.94)	170(62.27)	419(64.96)	
No	123(33.06)	103(37.73)	226(35.04)	
c. Rainy season				0.798
Yes	239(64.25)	166(60.81)	405(62.79)	
No	133(35.65)	107(39.19)	240(37.21)	
Mode of green fodder feeding				3.313
Chaffed	44(17.67)	40(21.51)	84(19.31)	
As Such	94(37.75)	79(42.47)	173(39.77)	
Both	111(44.58)	67(36.02)	178(40.92)	
Tree lopping				15.249**
Yes	278(74.73)	238(87.18)	516(80.00)	
No	94(25.27)	35(12.82)	129(20.00)	
Concentrate feeding to goats				0.098
Yes	234(62.90)	175(64.10)	409(63.41)	
No	138(37.10)	98(35.90)	236(36.59)	
If yes then fed to				0.414
All goats	184(78.63)	140(80.00)	324(79.22)	
During lactation	41(17.52)	27(15.43)	68(16.62)	
During breeding	9(3.85)	8(4.57)	17(4.16)	
Time of concentrate feeding				3.679
Morning	191(81.62)	129(73.71)	320(78.24)	
Evening	43(18.38)	46(26.29)	89(21.76)	
Mode of concentrate feeding				1.448
As such	206(88.04)	159(90.86)	365(89.24)	
Soaked	24(10.26)	15(8.57)	39(9.54)	
Cooked	4(1.71)	1(0.57)	5(1.22)	
Source of concentrate				9.196**
Home	112(47.86)	110(62.86)	222(54.28)	
Market	35(14.96)	17(9.71)	52(12.71)	
Both	87(37.18)	48(27.43)	135(33.01)	
Special feeding- post kidding				1.647
Yes	335(90.05)	237(86.81)	572(88.68)	
No	37(9.95)	36(13.19)	73(11.32)	
Feeding of mineral mixture				3.568
Yes	33(8.87)	37(13.55)	70(10.85)	
No	339(91.13)	236(86.45)	575(89.15)	
Feeding of common salt				21.599**
Yes	118(31.72)	136(49.82)	254(39.38)	
No	254(68.28)	137(50.18)	391(60.62)	

Figure in parenthesis indicate percentage and *Significant ($P < 0.05$), **Significant ($P < 0.01$)

The results of present study revealed that maximum goat rearers (65.58%) adopted semi stall feeding system followed by those who adopted complete grazing (32.56%) and stall feeding system (1.86%). Present findings are in agreement with those reported by Gurjar *et al.* (2009), Sabapara (2010) Kumar

(2011) Jana *et al.* (2014), Singh *et al.* (2014) and Sorathiya *et al.* (2016). Majority of the goat keepers (80.46%) grazed the goats on an average 5-8 hrs followed by those who grazed the animals for more than 8 hrs (12.87%) and those who grazed the goats for less than 5 hrs during summer season (6.67%). The corresponding values of winter and rainy season were 48.84, 4.81 and 46.36 and 65.89, 17.52 and 16.59 per cent, respectively. The grazing was done mostly on community land (95.97%). On the other hand, remaining 4.03 per cent goat rearers used their own land for grazing of the goats. Similar findings were also reported by Gokhale *et al.* (2002), Sabapara (2010), Kumar (2011), Jana *et al.* (2014) and Singh (2015).in their study area. The dry fodder was provided by majority (65.12%) of the goat rearers in summer season followed by 45.43% in rainy and 33.33% in the winter seasons in the surveyed area. More or less similar findings were also reported by Pathodiya (2003), Sharma (2005), Kumar (2011) and Jana *et al.* (2014). Majority of goat rearers (38.57%) used chaffed dry fodder followed by 34.05% goat keepers who used both (chaffed and unchaffed) and 27.38% using unchaffed dry fodder to feed the goats. Majority (66.82 %) of goat rearers provided green fodder to the goats in winter season followed by 64.96% and 62.79% of farmers who provided green fodder to the goats in summer and rainy seasons, respectively. Majority of goat rearers (40.92 %) used chaffed and unchaffed fodder (both) to feed the goats followed by 39.77% who fed the fodder unchaffed and 19.31% who fed chaffed green fodder to the goats. The information collected on tree lopping for feeding the goats revealed that maximum (at 80.00 per cent) goat rearers followed this practice while 20.00 per cent of the surveyed population did not practice lopping of trees. The maximum proportion of respondents who practiced lopping of trees belonged to Nainital district. Majority of goat owners (63.41%) fed concentrate to the goats. Majority of goat keepers (79.22%) fed concentrate to all goats followed by 16.62% who fed concentrate only to lactating goats whereas 41.6% fed concentrate to the goat during breeding. These findings are in agreement with the results obtained by Gurjar *et al.* (2009), Kumar (2011), Singh *et al.* (2014), Sabapara and Kharadi (2015) and Sorathiya *et al.* (2016). The maximum goat rearers (78.24 %) provided concentrate to the goats during morning time followed by those offering it during evening (21.76 per cent). Majority of goat rearers (89.24%) fed concentrate to the goat as such followed by those (9.54%) who soaked the feed and then by those (1.22%) who also cooked the feed. Most (54.28%) of the respondent fed homemade concentrate mixture to the goats followed by those feeding a mixture of home prepared and readymade (33.01%) and then by those feeding readymade concentrate mixture purchased from market (6.25%). Present findings are in agreement with those reported by Gurjar *et al.* (2009) and Jana *et al.* (2014). The data related to special feeding post kidding were encouraging, because majority of goat keepers (88.68%) practised special feeding to the female goats post kidding but 11.32 per cent goat rearers did not adopt this practice. Energy rich jaggery, wheat (*Triticum aestivum*), barley (*Hordeum vulgare*), paddy (*Oriza sativa L.*) and coconut (*Cocos nucifera*) mixed with ajuvayan (*Trachyspermum*

ammi), Sowa (*Anethum sowa*) and Methi (*Trigonella foenum-graecum*) were fed to the goats to prevent stress and to provide sufficient energy for freshening and increasing milk production. This was a good practice adopted by goat keepers because just after kidding does require more energy to relieve stress. Present findings are an indication of successful communication by the technical agencies working in this area which has resulted in adoption of this practice by the farmers. Only 10.85 per cent goatherds fed mineral mixture supplements to the goats regularly. It might be due to the fact that the goat rearers were not aware about the benefits of mineral mixture feeding and unwillingness in its use due to additional cost of mineral mixture involved. Maximum goat rearers at 60.62 per cent did not use common salt feeding practice whereas, 39.38 per cent goat rearers were aware of feeding common salt with concentrate to the goats. The maximum (49.82%) proportion of respondents who practiced feeding of common salt belonged to Nainital district as compared to U.S. Nagar (31.72%). The reason behind this might have been that in Nainital district goiter in goats had a higher incidence due to deficiency of iodine, therefore extension functionaries had advised the goat keepers to feed iodized common salt to avoid this problem. The overall data revealed that average concentrate fed per goat was found to be 98.35 ± 4.26 g/ day, it was maximum in Nainital district (101.87 ± 5.46 g) and minimum in U.S. Nagar district (94.84 ± 4.70 g). The maximum proportion of goat rearers (43.26%) fed 100-200g concentrate per goat per day followed by 12.40% who fed less than 100g concentrate/day/goat, while few goat rearers (7.75%) fed more than 200g concentrate/day/goat. A good number of beneficiaries (36.59%) never used concentrate mixture (Table 2) to feed the goats. Present findings are in agreement with those reported by Gurjar *et al.* (2009), Kumar (2011), Singh *et al.* (2014a) and Singh (2015).

Table 2: Means and their SE (g) for quantity of concentrate fed to goats by goat keepers

Concentrate feed /day (g)	Districts						Overall (N=645)		
	U.S.Nagar (N=372)			Nainital (N=273)					
	Mean $\pm$ SE	N	%	Mean $\pm$ SE	N	%	Mean $\pm$ SE	N	%
Nil	0.00	138	37.10	0.00	98	35.90	0.00	236	36.59
< 100	71.04 $\pm$ 1.67	49	13.17	84.14 $\pm$ 2.51	31	17.71	77.59 $\pm$ 1.63	80	12.40
100-200	146.38 $\pm$ 2.96	162	43.00	151.36 $\pm$ 2.91	117	66.86	148.87 $\pm$ 2.56	279	43.26
> 200	271.89 $\pm$ 4.06	23	6.18	264.14 $\pm$ 4.14	27	15.43	268.02 $\pm$ 2.93	50	7.75
Overall	94.84 $\pm$ 4.70	372	100	101.87 $\pm$ 5.46	273	100	98.35 $\pm$ 4.26	645	100

The association between district and feeding management practices followed by goat keepers' viz., mode of feeding, grazing hours, feeding of dry and green fodder, mode of green fodder feeding, concentrate feeding, time and mode of concentrate feeding, provision of special feeding post kidding, feeding of mineral mixture and was found to be non-significant whereas, grazing site, mode of dry fodder feeding, tree lopping, source of concentrate, common salt feeding was significant.

Conclusion



Based on results of present study it was concluded that the goat keepers of the region were not fully aware about improved feeding management practices. It can be achieved by following improved husbandry practices, which will not only improve the production performance of the goats but also improve the socio-economic conditions of the goat rearers.

Acknowledgement

The authors are thankful to the Director Experiment, G. B. Pant University of Agriculture & Technology, Pantnagar, Uttarakhand for encouragement and providing facilities for the study.

References

1. BAH & FS, 2013. Basic Animal Husbandry and Fisheries Statistics 2013. Ministry of Agriculture, Department of Animal Husbandry, Dairying and Fisheries, Krishi Bhawan, New Delhi.
2. GOI. 2014. Agriculture Census 2010-11. All India Report on Number and Area of Operational Holdings. Agriculture Census Division, Department of Agriculture and Cooperation, Ministry of Agriculture.
3. Gokhale SB, Gokhale RB, Phadke NL. and Desale RJ. 2002. Status of village goat management practices in Maharashtra. *Indian Journal of Animal science*. 72 (9): 810-814.
4. Gurjar ML, Pathodiya OP. and Tailor SP. 2009. Feeding practices of goats adopted by the farmers of Mewar region of southern Rajasthan. *Indian journal of small Ruminants*, 15 (1): 68-73.
5. Jana C, Rahman FH, Mondal SK. and Singh AK. 2014. Management practices and perceived constraints in goat rearing in Burdwan district of West Bengal. *Indian Research Journal of Extension Education*, 14 (2): 107-110.
6. Kumar V. 2011. Study on goat management practices in north-west semi arid region of Rajasthan. M.V.Sc. thesis Rajasthan University of Veterinary and Animal Sciences, Bikaner (Rajasthan).
7. Pathodiya OP. 2003. Annual report (2002-03) All India coordinated Research Project on Goat improvement (Sirohi Field Unit), Livestock Research station Vallabhnagar (MPUAT, Udaipur) Raj. India, pp. 8-9.
8. Sabapara G. P. and Kharadi VB. 2015. Adoption improved goat rearing practices in Southern Gujarat. *Indian Journal of Small Ruminants*. 21(2):367-369.
9. Sharma MC. 2005. Genetic investigation of body weight and Morphometry traits of Sirohi goats in the field. Ph.D. thesis Maharana Pratap University of Agriculture & Technology, Udaipur (Rajasthan).
10. Singh MK, Rai B, Dixit AK, Singh R and Singh SK. 2014. Management practices of goats in Bundelkhand region. *Indian Journal of Small Ruminants*, 20(2): 99-105.
11. Singh B. 2015. Annual report (2014-15), All India coordinated research project on goat improvement (Pantja field unit), G. B. Pant University of agriculture and Technology, Pantnagar (Uttarakhand).
12. Sorathiya LM, Fulsoundar AB, Tyagi KK, Patel MD and Bhamsaniya HB. 2016. Management practices of goat followed by Ahirs in heavy rainfall zone of Gajarat. *The Indian Journal of Small Ruminants*, 22(1): 92-96.
13. Snedecor GW and Cochran WG. 1994. Statistical Method, 7th Edn. Oxford and IBH Publishing Co., Calcutta, India.