A COMPARATIVE STUDY OF GRAZING BEHAVIOUR OF TEDDY GOATS VERSUS THALLI SHEEP

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Summary

Experiment involved range vegetation classified into three major classes: Xerophytic trees, shrubs and grasses. Among them samples of major plant species were collected and analysed for chemical composition. The experimental animals 20 each of Thalli sheep and Teddy goats, located at Livestock Experiment Station Rakh Kharewala district Layyah (Pakistan) were randomly drawn from the main flock. The grazing pattern data were collected from one animal of each species. The observations regarding the grazing behaviour, breeding efficiency and carcass quality were also determined. It was found that overall preference index of Teddy goats were higher for Khabble (*Cynodon dactylon*) indicated by percent of the total number of bites made on different plant species, while the bites on Lumb (*Aristida plumosa*), Mahabbat booti (*Cenchrus biflorus*), Dhaman (*Cenchrus ciliaris*) and Karera (*Elionorus hirsutus*) were found to be 1.28, 6.74, 0.32 and 3.87 percent. The browsing species as a whole were utilized more during the draught period. Among the grasses, sheep heavily utilized Khabble grass, with overall bite percentage of 89.27. Within browsing species Wan (*Salvadora oleoides*) and wind fallen dry leaves of Wan were considerably picked by the sheep showing 1.19 and 3.49 overall bite percentage respectively. The overall daily growth rates & dressing percentage for Teddy goats and Thalli sheep were 48.33, 39.00 and 51.00, 46.00 percent respectively. Moreover, among the experimental animals 50 percent goats exhibited signs of oestrus where as none of the sheep came into heat during the study period.

(**Key Words**: Grazing Behaviour, Thalli, Teddy, Grasses, Bites, Browsing Species)

Introduction

Livestock production is an essential agricultural activity in Pakistan. The share of livestock to GDP is around 8 percent and accounts for 29.4 percent of the agricultural value added. Pakistan is quite deficient in forest resources. Out of total geographical area of 79.61 million hectares, forests cover 3.0 million hectares or only 3.8 percent of the country area (Anonymous, 1989). The range land constitutes the single largest land use in Pakistan (Qureshi and Hanjra, 1969). Most of the land is unfit for agronomic crops due to unfavourable soil, under ground water or climatic conditions. Most of the livestock either wholly or partially is supported on these ranges. To a great extent the area is highly suited for raising sheep and goats because of peculiar topography. Moreover it is estimated that Pakistan range lands can support about 5 million animal units, while at present 15 million animal units are subsisting on range lands (Din, 1980).

Livestock, in general serve the mankind in various ways i.e. in form of food, clothes, employment, research etc. Among the various classes of livestock, small ruminants like sheep and goats are major contributors towards meat production. The consumption rates of sheep and goats are 47 and 54 percent respectively (Siddiqui, 1982). The increased consumption is due to people preferences for goat meat. Among the goats, Teddy goat has gained much popularity recently owing to its early maturity, prolificacy and meat quality, and increasing in number at much faster rate. Keeping in view its rapid multiplication rate, it is expected that it will be of great help to bridge over the gap of quality protein deficiency which has become a major problem in the way of physical and mental development of Pakistani manpower. This animal, however has not been studied much under range conditions in Pakistan. Thus the present study was planned to compare

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the grazing behaviour of Teddy goats with that of Thalli sheep.

Materials and Methods

The study was condducted at the Livestock Experiment Station, Rakh Kharewala, Distt Layyah (Pakistan). The grazing area were divided into several large exclosures. The range vegetation was classified and forage yield was determined by dipping method in 20 quadrates randomly picked up from the whole lot on the range. Samples of the major plant species prevailing on the range area were collected and analysed in the laboratory for their proximate contents. The experimental animals, 20 each of Thalli sheep and Teddy goats, were randomly drawn from the main flock being maintained at the station. Animals were weighed and identified by putting on numbered neck collars. Deworming and dipping were performed before putting the animals under observations. The experimental animals were weighed at 30 days interval and daily weight gain was calculated. The breeding efficiency was determined by the number of females covered out of the total animals exposed. Two animals of each species were slaughtered to get the carcass data.

The grazing pattern data were collected on one animal of each species, grazing with rest of the flock daily, each animal of each species was randomly drawn from the experimental flocks of both the species. The observations on these animals were taken for four consecutive days per month, starting from March 15, to July 15, 1984. The number of bites by each animal on each plant species were recorded twice daily for one hour, at onset of grazing (08:00 A.M.) and afternoon (05:00 P.M.). Bites were recorded by allowing the animals to graze freely and were observed with the help of binocular and counted the number of bites of an animal per plant species and the time on one plant species with the help of a stop watch (Quraishi and Ishaque, 1991). The seasonal preferences for each plant species were also recorded.

The observations regarding the grazing behaviour of both Teddy goats and Thalli sheep were analysed on percentage basis. Thus, percent bites on each plant species were used to determine the preference pattern by the experimental animal of each species. Similar method was used to determine monthly overall, and morning evening preferences. The data regarding daily weight gain were subjected to analysis of variance technique as described by Steel and Torrie (1982).

Results

Plant cover and soil type

Experimental area is a part of Thal desert. Most of its area is composed of huge loamy sand dunes and small interdunal valleys of similar material. The dunes bear shrubs, grasses and small trees. The annual rainfall recorded during the study period was 241 mm. The temperature varied from zero to 49.4°C. The range vegetation of the area can be classified in to three major classes namely Xerophytic trees, shrubs and grasses. Visual appraisal revealed that 60 to 70 percent of the range area is covered by palatable grass species, out of which 60 percent is constituted by Khabble. The forage yield by dipping method in 20 quadrates randomly picked up was determined as 984 kg/hectare on air dry basis.

Grazing Behaviour

The results of this study showed that overall preference index of Teddy goat was high for Khabble grass which was 40.57 percent of the total number of bites made on different plant species during the study period. This preference index increased from 28.33 percent in the month of March to 56.65 percent in July. Grasses as usual remained coarse during the month of March, April and May, resulted in to low preference index but with the onset of rainfall, Teddy goats liked Khabble grass and preference index was almost doubled in the month of June and July, when the grass was lush green. The overall preference index for Mohabbat booti, Karera, Lumb and Dhaman were 6.74, 3.87, 1.28 and 0.32 percent respectively. The goats preferred these grasses in March but a significant decrease in preference was observed in the month of July. The goats picked up the green parts of these grasses at the expanse of Khabbale and Mohabbat booti, but when rainfall started, there was plenty of Khabble and Mohabbat booti, goats then shifted to these grasses. Among the browsing species Phog, Babli, Jandi, Wan, dry leaves of

Wan and Beri as a whole were utilized more in March when the grasses were dry. The overall percentage of the total number of bites for the above mentioned browsing species were 13.0, 9.13, 7.64, 6.27, 4.28, 0.61, respectively. Phog was utilized more (23.20%) in March at the expanse of dry grasses because of new sprouting and availability of lush green material to the goats.

Among the grazing plant species Bhakhra was picked up more in the months of June and July, because growth of the Bhakhra started in June after rainfall and thus its utilization was more in June, when it was lush growing.

The results are in agreement with those of McMahan (1964) who suggested that goats diet should consist of over 50 percent browse during all seasons of year. Grasses were utilized more heavily in spring when it was young and succulent. The results of this study indicated that 70 to 80 percent of the bites were made on young and succulent grasses when available to goats. The results of the present study have also indicated that Teddy goats have higher selection index for Phog (Calligonam polygonoides) as compared to other browsing species. Goats picked up more Khabble, when it was in luxurious growth and it made up a major portion of their diets. It was also concluded from the results that goats tend to utilize variety of plant species including grasses, shrubs and trees. Generally it is considered that goats are browsers but the results of this study has shown that goats utilized less browsing species than other grazing plant species and demonstrated themselves as graziers rather than browsers as it is evident from the fact that 58.06 percent of bites were made on grazing species during the study and remaining number was given to browse. The present findings are substantiated by those of Gall (1981). The results are in a way in accordance with those of Wilson et al. (1975) who in a review suggested that goats diets consisted largely of browse with the leaves of rose wood (Heterodendrum olcifolium). Regarding sheep, they utilized Khabble grass heavily throughout the study. The bites percentage for Khabble was 70.65 in March which registered a gradual increase per month and reached to 97.46 in July. Sheep was found to have maximum preference for Khabble grass in the month of July as compared to Teddy goat (97.46% vs. 56.65%).

Among other grasses, Lumb was utilized more. Within the browsing species Wan and dry leaves of Wan were considerably picked up by the sheep in March, when the grasses were dry and bites percentages were 7.85 and 9.84 respectively. But as the green palatable grass was available, this percentage was reduced to 0.14 and 0.15 respectively in July. This information also supports the idea about the sheep as graziers and thus tended to browse only in case when young and succulent Khabble was not available. All other plant species were relished slightly by the sheep throughout the study. The results are in accordance with the earlier findings (Anonymous, 1970) in which sheep were observed to graze on young, tender and bottom grasses. When young grasses are not available, sheep browse on bushes, shrubs and trees. Based on the results of the present study it could be inferred that sheep diets are mainly dependent upon Khabble grass which was consumed by 89.27 percent bites. Sheep browsed only under the conditions when coarse and dry leaves were available.

It is evident from the data given in table 1 that Teddy goat and Thalli sheep relished all plant species in the morning with the exception of Khabble grass, which was picked up more in the evening by Teddy goat. It was perhaps due to their increased demands for plants from browsing species in the morning rather than in evening. The overall percentage of bites in morning and evening of both Teddy goat and Thalli sheep were 58.54, 41.46 and 57.52, 42.48 respectively. Overall bites percentages of various plant species are given in table 1 for the general information.

Growth Rate

The overall average daily growth rates for both Teddy goats and Thalli sheep in the experiment were 48.33 and 39.00 gm respectively. There was lack of precipitation in the month of March, April and May, and thus the animals were supplemented with green fodder in March. Teddy goats showed a steady increase in growth rate in the first three month as shown in the table 2. Although young and succulent grasses were available but there was sudden depression in growth rate during the month of July. It indicated that goats utilized browse material more efficiently and gained more in terms of weight during the draught period. The sudden drop in

TABLE 1. GRAZING BEHAVIOUR OF ANIMALS (PERCENT BITES PER PLANT SPECIES)

Plant species	Overall percentage			Overall percentage		
	Teddy goat	Morning	Evening	Thalli sheep	Morning	Evening
Khabble (*Cynodon dactylon*)	40.57	18.55	22.02	89.27	52.20	37.08
Dhaman (*Cenchrus ciliaris*)	0.32	0.20	0.12	0.15	0.01	0.15
Karera (*Elionorus hirsutus*)	3.87	2.09	1.79	0.11	0.04	0.06
Lumb (*Aristida plumosa*)	1.28	0.79	0.49	3.03	1.83	1.20
Mohabbat booti (*Cenchrus biflorus*)	6.74	5.14	1.60	0.03	0.01	0.02
Khawwi (*Cymbopogon jawarencusa*)	0.70	0.47	0.23	0.76	0.53	0.23
Wan (*Salvadora oleoides*)	6.72	4.31	1.96	1.19	0.84	0.35
Dry leaves (*Wan*)	4.28	2.68	1.60	3.49	2.09	1.40
Phog (*Calligonum polygonoides*)	13.00	7.43	5.57	0.45	0.28	0.17
Babli (*Acacia jacquemontii*)	9.13	6.18	2.95	0.40	0.40	–
Beri (*Zizyphus jujuba*)	0.61	–	0.61	–	–	–
Jandi (*Prosopis spicigera*)	7.64	5.55	2.09	–	–	–
Bui (*Kochia indica*)	0.67	0.50	0.17	0.96	0.25	0.71
Aak (*Calotropis procers*)	0.33	0.21	0.12	0.03	0.01	0.02
Bakhra (*Tribulus aiatus*)	4.46	3.31	1.15	0.13	0.07	0.05
Dhodak (*Euphorbia microphylla*)	0.03	0.03		–	–	
Overall percentage (%)		57.44	42.47		58.54	41.46

TABLE 2. WEIGHT GAIN TREND OF EXPERIMENTAL ANIMALS

Months	Teddy goats		Thalli sheep	
	Average monthly weight gain (kg)	Average daily weight gain (gms)	Average monthly weight gain (kg)	Average daily weight gain (gms)
March	1.50	50.00	1.80	60.00
April	1.70	56.67	0.90	30.00
May	2.00	66.67	0.70	23.33
June	0.85	28.33	0.65	21.67
July	1.20	40.00	1.80	60.00
Overall average	1.45	48.33	1.17	39.00

the growth rate in the month of June and July was probably, due to the shifting of goats from browsing material to the grasses and thus gained less.

On the other hand sheep exhibited better growth rate during March when fodder was supplemented, but with the onset of drought season, a decline in growth rate was observed. When luxurient grasses were available, the gain was boosted up. Minimum weight in June is due to the fact that grasses were just sprouting after rainfall. Study concluded that Teddy goats utilized the rangeland during the drought period more efficiently and thus grew at faster rate.

The dressing percentage of Teddy goats and sheep was 51.0 and 46.0 respectively. Physical texture, juiciness, tenderness and flavour of goat meat was better than that of sheep meat.

Breeding Behaviour

Out of 20 Teddy females, 10 females exhibited signs of oestrus in the month of June and were served. Only one female was recorded to be the repeater.

Out of 20 sheep, none showed signs of oestrus. These observations are in line with the results of earlier Anonymous, 1982. Overall dressing percentage for castrated and non castrated Teddy males were reported to be 49.9±2.33 and 47.19+3.7 respectively (Anonymous, 1982). This information is in line with those of Khan (1971) who reported that dressing percentage in Salt range sheep raised on rangeland was 46.03.

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