EFFECT OF CONCENTRATE SUPPLEMENTATION ON BROWSING BEHAVIOUR OF BERARI KIDS
Feeding behaviour in Berari kids

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Abstract: Present experiment was carried out with the objective to study the effect of concentrate supplementation on browsing behaviour of Berari kids. Eighteen Berari kids (4 to 6 month of age) were allowed for browsing on natural vegetation around the farm premises from 10.00 -16.00 hours (6 hours daily). The kids were randomly distributed into three groups of equal number viz., T_0, T_1 and T_2. Kids of Gr-T_0 were allowed to browse on natural vegetation only. Kids of Gr-T_1 were supplemented grain mixture (16% crude protein and 65% total digestible nutrients) along with browsing whereas, Gr-T_2 were supplemented commercial concentrate feed (16% crude protein and 65% total digestible nutrients)) in addition to browsing. The behaviour of animals was recorded once a week for 24 hours by direct visual observation. The kids of Gr-T_0 showed significantly ($P<0.01$) higher time on browsing activity (28.02 min/day) as compared to Gr-T_1 (23.38 min/day) and Gr-T_2 (22.69 min/day). A significant difference ($P<0.01$) was found in browsing time and ranged from 218.40 min/day in Gr-T_2 to 231.58 min/day in Gr-T_0. The ruminating time varied significantly ($P<0.01$) from 301.16 min/day in Gr-T_2 to 332.90 min/day in Gr-T_0. It was concluded that the concentrate supplementation reduced the grazing time, browsing time and ruminating time in kids.

Keywords: Behavior, Berari, Concentrate, Supplementation

Introduction: Major behaviours of goats when let loose for browsing in pasture are browsing, grazing, standing, idling, walking, ruminating, interaction and other drinking, scratching, self-grooming etc. The differences exist between in these behavioral activities across the breeds and within breed. These factors influence the amount of food consumed and therefore the net amount of nutrients available for metabolic ration. The present study was undertaken to record the behavior of recently registered Berari kids while grazing and in shelter.

Materials and Methods: The present experiment was conducted at "Berari Goat and Deccani Sheep Research, Demonstration and Training Centre, Borgaon Manju, Akola (Maharashtra). Eighteen Berari kids of 4 to 6 months age were selected irrespective of sex and randomly distributed into three equal groups. The kids were housed under loose housing system and let loose for browsing on natural vegetation around the farm premises for six hours (10:00 am – 4:00 pm). Kids of Gr T_0 were allowed to graze / browse on natural vegetation only. T_1 group was fed grain mixture (16% crude protein and 65% total digestible nutrients) along with grazing/browsing, whereas T_2 group was supplemented commercial concentrate (16% crude protein and 65% total digestible nutrients) in addition to grazing/browsing. Drinking water was provided *ad libitum* during the confined hours of the day to all the kids. The experiment was conducted for a period of two months during April and May (summer).

Behavioural recording (on 24 hr basis) was done once a week by direct visual observation. The activities like grazing, browsing, ruminating and grazing: browsing ratios were recorded in terms of total time spent by individual kid (min/day).The data were analyzed with factorial completely randomized design (Snedecor and Cochran, 1994).

Results and Discussion: The meteorological observations during experimental period were presented in Table 1. The kids of Gr T_0 spent significantly ($P<0.01$) higher grazing and browsing time as compared to groups supplemented concentrate mixture (Table 2). It might be due to partial fulfillment of the dry matter requirement in groups (T_1 and T_2) by the concentrates. The grazing time showed decreasing trend during the progression of experiment. The increased environmental temperature might have been responsible for the gradual decrease in grazing time. Bordi et al. (1991) also reported higher grazing activity in control group (without any supplementation) than supplemented animals. The average browsing time was also lower in supplemented groups compared to control group. There was weekly significant decrease in average browsing time in all groups. On an average Berari kid spent 0.5% time on grazing and 35% time on browsing. Sharma et al. (1998) reported that Jamunapari and Barbari goats spent more time (52.9-62.0%) on browse during summer. Animut et al. (2005) found that time spent on browsing was 52.7% of active feeding time in sheep and goats when grazed together at three different stocking rates. Njoka-Njiru et al. (2001) also concluded that in the behaviour like feeding in dry period per 12 hrs observation time was 7.26 hrs in Toggenberg goats in subhumid Kenya.

Table 1. Meteorological observation during experimental period

Weeks	Ambient temperature (°C)		Sunshine hours
	Minimum	Maximum	
1	25.2	40.9	12.00
2	27.3	41.4	12.00
3	28.1	42.5	12.15
4	28.1	43.2	12.20
5	30.2	43.5	12.40
6	30.8	44.0	13.00
7	31.0	44.7	13.00
8	30.6	44.8	13.00

Table 2. Mean (±SE) grazing and browsing time of Berari goat kids fed during 10:00 am – 4:00 pm daily

Week	Grazing time (min/day)				Browsing time (min/day)			
	T_0	T_1	T_2	Overall	T_0	T_1	T_2	Overall
1	33.81±1.53	30.87±0.46	30.02±0.78	31.57±0.92^{d}	256.86±1.32	242.72±2.07	244.80±4.11	248.13±2.50^{e}
2	30.58±1.07	27.30±0.62	28.83±1.22	28.90±0.97^{c}	239.22±3.71	230.28±2.58	226.12±1.56	231.87±2.61^{d}
3	29.79±2.03	26.12±1.20	26.89±0.96	27.60±1.39^{c}	239.49±4.68	229.80±2.56	230.12±1.15	233.14±2.69^{d}
4	28.48±1.53	22.96±1.28	22.43± 1.01	24.62±1.27^{b}	231.38±5.29	221.86±4.05	219.86±2.91	224.36±4.08^{c}
5	26.95±1.49	21.89±1.49	19.97±1.24	22.94±1.40^{b}	228.27±4.95	211.62±3.01	210.35±1.18	216.74±3.04^{b}
6	25.86±2.13	19.26±1.58	18.44±1.00	21.18±1.53^{a}	224.95±3.82	207.49±4.05	210.47±1.72	214.30±3.19^{b}
7	23.65±1.98	19.06±1.21	16.96±0.52	19.89±1.23^{a}	216.65±2.76	208.40±2.39	206.52±2.22	210.52±2.45^{a}
8	25.07±1.68	19.62±0.80	17.98±0.58	20.89±3.06^{a}	215.79±2.26	205.24±0.87	198.99±2.06	206.67±1.73^{a}
Overall	28.02±1.17^{b}	23.38±1.53^{a}	22.69±1.84^{a}	24.70±1.51	231.58±4.79^{b}	219.68±4.81^{a}	218.40±5.24^{a}	223.22 ±4.95

Means bearing similar superscript does not differ significantly (P<0.01)

The overall grazing: browsing ratio for Berari kids when let loose for grazing during 10:00 am – 4:00 pm was 1: 8.29 for T_0, 1: 9.47 for T_1 and 1: 9.73 for T_2. As presented in Table 3, kids spent more time on browsing in supplemented groups (T_1 and T_2). Raats (1988) found that with abundant forage, time spent browsing during the mornings is more than four times that of grazing (1: 4.2) and when forage is limited it decrease to equal time spent on browsing and grazing in South Africa.

Table 3. Total feeding (grazing + Browsing) time (min/day) of kids under different groups

Group	Week							
	1	2	3	4	5	6	7	8
T_0	290.68	269.80	269.29	259.86	255.23	250.81	240.31	240.87
T_1	273.59	257.58	255.92	244.83	233.51	226.75	227.46	224.87
T_2	274.83	254.95	257.01	242.29	230.33	228.91	223.49	216.98

The overall average rumination time of Berari kids (Table 4) under grazing only group (T_0) was higher compared to the supplemented groups (T_1 and T_2). Forage intake has significant effect over the rumination time. As forage intake increased, there was significant increase in rumination time and when concentrate intake increased, there was reduction in rumination time (Shinde et al., 1997). The kids under grazing only group (T_0) spent more time for grazing and browsing compared to supplemented groups (T_1 and T_2), it might lead to more consumption of forage than the other groups (T_1 and T_2) and therefore the time spent by kids in control group for rumination was more. Moon et al. (1994) studied the rumination behaviour over a 24 hr period with supplementary feeding of concentrate at various level and concluded that rumination time in was also significantly (P<0.01) affected by concentrate supplementation.

Table 4. Average Ruminating time (min/ day) of Berari goat kids

Week	T_0	T_1	T_2	Overall
1	357.88±3.82^{f}	344.02±2.70^{e}	352.65±3.64^{e}	351.52±3.30^{e}
2	348.28±3.54^{e}	327.91±3.77^{d}	330.40±3.83^{d}	335.53±3.71^{d}
3	347.52±5.60^{e}	312.52±3.28^{c}	300.83±4.40^{b}	320.29±4.42^{c}
4	327.86±3.65^{d}	294.49±3.74^{b}	291.06±5.91^{a}	304.47±4.43^{b}
5	319.93±2.06^{c}	293.91±4.12^{b}	288.00±2.72^{a}	300.61±2.96^{a}
6	321.18±2.99^{c}	290.89±2.20^{a}	282.96±2.43^{a}	298.34±2.54^{a}
7	316.42±2.88^{c}	289.78±3.92^{a}	285.53±3.81^{a}	297.24±3.53^{a}
8	324.16±2.02^{d}	283.59±3.64^{a}	281.49±2.86^{a}	296.41±2.84^{a}
Overall	332.90±5.59^{b}	304.64±7.58^{a}	301.16±9.20^{a}	313.05 ±7.46

Means bearing similar superscript does not differ significantly (P<0.01)

It was concluded that the grazing time, browsing time and ruminating time were reduced in

concentrate supplemented kids. This might be because of adverse effect of environmental condition.

Authors are thankful to

Acknowledgements: Associate Dean, Post graduate institute of veterinary and animal sciences, Akola for financial support and to Deputy Director (Research), Berari Goat and Deccani Sheep Research, Demonstration and Training Centre, Borgaon Manju Dist. Akola for granting permission and facility for research work.

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