



Effect of Different Feeding Systems on Growth Performance of Rohilkhandi Goat Kids

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ABSTRACT

The present study was conducted to see the effect of different feeding systems on the performance of kids. A total 21 local goat kids of Rohilkhand region weighing around 7-11 kg and ageing 4-5 months were selected and randomly made in to 3 groups. Group-I (Gr- I) was fed un-chopped green fodder in circular feeder (newly designed). Group-II (Gr- II) was fed un-chopped green fodder in linear feeder, similar to the existing farm practice. Group-III (Gr-III) was fed chopped green fodder in linear feeder (modified version). Amount of concentrate and dry fodder fed was kept constant. *Ad libitum* green fodder was fed and at the end left over was recorded. The ADG of kids in Gr I, Gr II and Gr III were 33g, 33g and 40 g respectively. Gr III had consumed significantly ($P<0.05$) higher than Gr-I and Gr-II at every fortnight both on fresh and dry matter basis. The green fodder wastage was significantly ($P<0.05$) higher for Gr I and lowest in Gr-III. The overall FCR was 1:9.46, 1:8.93 and 1:9.37 in Gr-I, Gr-II & Gr-III respectively. The total time required for feeding and cleaning of the pens was significantly higher in Gr I than Gr II and Gr III. It can be concluded that provision of un-chopped fodder in circular feeder did not give any advantage over linear feeding trough. Further chopped fodder did not help in body weight gain but helped in reducing the feed wastage.

Keywords: Chopped, Feeder, Feeding System, Rohilkhandi Kids, Growth Performance

Goat is being reared under different systems depending upon region breed and type of farmer. Keeping demand of goat in view, many progressive farmers started opening goat farms in and around the urban and peri-urban areas. Under this situation, intensive system /confinement are the only option due to scarcity of space and here goats are exclusively stall-fed (zero-grazed). Whether intensive or semi-intensive there should be some arrangement for feeding of goats as per the browsing behaviour of the animals. Very selective feeding behaviour is an essential component of goat behaviour because it enables goats to stay in difficult areas as well as to cope better with toxic plants (Duncan and Young, 2002). The experienced goats strongly modify their preferences and the vegetal stratum chosen and these changes are modulated by plant prehensibility, particularly plant height (Dziba *et al.* 2003b). OnGoats spend 26% of their time in feeding during the day. Goats naturally prefer to eat at the height of about 20 to 120 cm above the ground (Peacock, 1996)

in standing position. Thus if any feeding arrangement is not according to their behaviour, the possibility of wastage of fodder is more. Most of the feeders are available in the market are mostly linear or hexagonal. Similarly, earlier researchers (Mishra *et al.* 1992; Singh *et al.* 1992 and Van *et al.* 2005) have attempted to feed the green fodder in chopped form but they found that it resulted in variable intakes. Keeping above points in view, we have attempted to compare the performance of goats by feeding the un-chopped fodder in newly designed feeding trough and chopped fodder in modified linear feeder.

MATERIALS AND METHODS

Experimental site

The study was conducted on the kids of Rohilkhandi goat available at Sheep and Goat Farm, Indian Veterinary Research Institute, Izatnagar (UP), located between



28.22°N latitude, 79.22°E longitude and at an altitude of 568 feet above mean sea level. The climatic conditions of the place touch both the extremes viz. cold (approximately 5°C in winter) and hot (approximately 45°C in summer). The relative humidity ranges between 15 and 85%. The average annual rainfall is about 90 to 120 cm and most of which is received during the months of July to September.

Experimental animals

A total of 21 growing kids (7-11 kg) and ageing 4-5 months were selected and randomly divided in to 3 groups consisting 7 animals each.

Group-I/Gr-I (Circular)

All goats under this group were maintained on un-chopped fodder. This un-chopped fodder was fed using the circular feeder. This circular feeder was newly developed by farm workshop, Indian Veterinary Research Institute, Izatnagar with measurement of 94 cm in diameter (lower), 168 cm in height (total). This feeder was sufficient for feeding at least 7 goats. This feeder design also discouraged fight among the goats due to less contact of body.

Group- II/Gr-II (Linear)

The un-chopped fodder was fed in the linear feeder which measured 240 cm in length, 54 cm in breadth and 88 cm in height. This feeder was being used since long time in the farm.

Group III/Gr-III

Goats were fed chopped fodder in linear feeder having length 153 cm, breadth 46 cm, height 88 cm. However, the feeder was modified in such a way that only head of the animal could get into the manger not the whole animal. The length of chopped fodder was 1-2 inch for maize during the experimental period.

All the three groups were fed same amount of green fodder whose weight was taken before feeding. Amount of concentrate and dry fodder fed was kept constant for all the three groups subject to equal increment in accordance with their increasing age. Experiment was conducted for 3 months. Body weights and measurements were taken

every fortnight in the morning hours. Fortnight body weight gain and Average Daily Gain (ADG) and FCR were calculated. The daily intake of green fodder (Maize) was recorded. The duration of time for feeding and cleaning the residues left over was recorded daily using stop watch. This data was used to calculate the man power requirement for all the three groups in terms of man seconds per day. Physiological parameters comprising rectal temperature and surface temperature of head, neck and canon of each animal of all the three groups were recorded. The statistical analysis was done using SAS as per the standard procedure.

RESULTS AND DISCUSSION

The mean body weight of kids at fortnightly interval at different stages of the experiment has been presented in (Table 1). The mean body weight (kg) of kids from the beginning to the end of the experiment were statistically non significant.

Table 1: Growth and performance of Rohilkhandi kids under different feeding systems

Attributes	Gr I	Gr II	Gr III
Mean body weight change (kg) ^{NS}	10.226 ± 0.34	11.200 ± 0.34	11.370 ± 0.42
Mean body weight gain (kg) ^{NS}	0.50 ± 0.06	0.49 ± 0.05	0.60 ± 0.07
Mean ADG gain (kg) ^{NS}	0.033 ± 0.004	0.033 ± 0.004	0.040 ± 0.005
Mean fodder intake (kg)*	4.42 ^a ± 0.04	4.66 ^b ± 0.04	5.42 ^c ± 0.08
Mean fodder wastage (kg)*	4.49 ^c ± 0.04	4.25 ^b ± 0.04	3.49 ^a ± 0.08
Mean Total dry matter intake (kg)*	4.01 ^a ± 0.02	4.13 ^b ± 0.03	4.51 ^c ± 0.05
FCR	9.46	8.93	9.37
Mean Total labour requirement (man-sec)*	123.33 ^c ± 1.76	115.69 ^b ± 1.29	87.50 ^a ± 1.07
Rectal temperature (C)*	38.80 ^a ± 0.08	38.20 ^b ± 0.07	38.69 ^a ± 0.10
Head surface temperature (C) *	29.78 ^a ± 0.56	29.01 ^b ± 0.47	30.71 ^c ± 0.39
Neck surface temperature (C) *	29.63 ^a ± 0.54	27.53 ^b ± 0.58	29.14 ^b ± 0.54

Canon surface temperature (C) *	25.90 ^a ± 0.70	22.78 ^b ± 0.68	22.67 ^b ± 0.67
Head surface temperature (C) *	29.78 ^a ± 0.56	29.01 ^b ± 0.47	30.71 ^c ± 0.39
Neck surface temperature (C) *	29.63 ^a ± 0.54	27.53 ^b ± 0.58	29.14 ^b ± 0.54
Canon surface temperature (C) *	25.90 ^a ± 0.70	22.78 ^b ± 0.68	22.67 ^b ± 0.67

Where, *: P 0.05; and NS: Non-Significant

The results indicated that, neither chopped nor un-chopped or linear or circular feeder had any adverse on growth. The total body weight gain was found to be non-significant in Gr-III (0.60 ± 0.07 kg) compared to other two groups, however it was relatively higher body weight gain. The body weight gain in Gr-I and Gr-II was not significantly different from each other. Comparatively higher body weight gain in kids of Gr- III might be due higher intake of solid feed (stem portion) which was encouraged through higher intake of stem portion.

The ADG (Table 1) in all the three groups was comparable and hence, type of feeder and presentation of fodders did not cause any adverse effect on ADG. The intervention made by using circular feeder in Gr I and providing three dimensional arrangements of stems to allow browsing of leaves did not improve the ADG which may be due to fewer intakes and more wastage of fodder. Stems once fallen and contaminated with dung and urine were not consumed at all.

As goats are selective feeders by natural habit, they do not eat once the feed is dropped on the ground and stamped (Peacock, 1996). Similarly in Gr II, there was comparatively less intake and more wastage, though higher than Gr III but lower than Gr I. In Gr III, Provision of chopped fodder led to higher intake, longer feeding time and consequently the animal spent less time ruminating.

Less mean retention time might be the reason for comparable average daily gain in Gr III. These results are contrary to the findings of Welch (1982) who reported that animals, which can ruminate more roughage during the 8 or 9 h of rumination, might be able to consume more roughage, but goats have been found to be a notable exception among the ruminants studied (cattle, sheep, goats) with high rumination efficiencies. The total time required for feeding and cleaning of the pens was highest in Gr I (123.33 ± 1.76 secs) and lowest in Gr III (87.50

± 1.07 secs) which differed significantly. Higher time in Gr I could be due to difficulty in placing the un-chopped fodder vertically in trough and higher feed wastage. The lower time required in G III could be due to easy handling of chopped fodder and less wastage due to spillage. However time required for chopping the green fodder was not included. The overall rectal temperature of kids in Gr I, Gr II and Gr III were 38.80 ± 0.08, 38.20 ± 0.07 and 38.69 ± 0.10°C respectively. The rectal temperature in Gr II was significantly (P<0.05) lower than other two groups The overall surface temperature at canon of kids in Gr I, Gr II and Gr III were 25.90 ± 0.70, 22.78 ± 0.68 and 22.67 ± 0.67°C respectively. The canon temperature in Gr I was significantly higher than other two groups. The similar pattern was also observed for surface temperature at head. However, the surface temperature at neck did show the same trend but the overall values did not differ significantly.

CONCLUSION

It can be concluded that provision of unchopped fodder in circular feeder did not give any advantage over linear feeding trough. Further chopped fodder did not help in body weight gain compared to unchopped fodder. However, chopping helped in reducing the feed wastage.

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