

Growth performance of Sirohi kids with varying levels of concentrate supplementation under field condition

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Journal of Livestock Science (ISSN online 2277-6214) 13: 178-181

Received on 24/5/22; Accepted on 30/6/22; Published on 15/7/22

doi. 10.33259/JLivestSci.2022.178-181

Abstract

In order to assess the influence of concentrate feeding, thirty male kids were selected from schedule caste farmers and divided into three equal groups of ten animals each; kids of three groups were allowed grazing for 8h daily. Group1 (G-1) was the control group with no concentrate mixture was supplemented and kids of the G-2 and G-3 were fed concentrate mixture 1% and 1.5%, respectively of their body weight. The feeding of concentrate resulted in a significant increase ($P<0.05$) in live weight of group G-2 and G-3 in comparison to G-1. In the present study net return from body weight gain of kids in G-2 and G-3 groups were Rs 24,605 and Rs 25,395 respectively. The feeding of concentrate was economical and a cost benefit could be generated on concentrate supplementation. It may be concluded that concentrate supplementation @ 1.5% of live weight along with free grazing for 8h was effective to augment growth of kids under arid condition of western Rajasthan.

Keywords: Kids; Concentrate feeding; Grazing; Growth Performance.

Introduction

In the arid area, low and erratic rainfall, lack of irrigation facilities etc. compelled the farmers of arid areas to diversify from crop to livestock production to counter the risk of crop failure. Thus, livestock production is major economic activity of farmers in arid zone. Livestock population in the region is much higher than the carrying capacity of land. Due to frequent drought and over grazing, the productivity of natural grassland in the region steadily decreasing (Lavania and Kumar, 2016).

In the arid region of Rajasthan, Goats are reared mainly on community range land and stubble grazing on cropped land after harvesting. Majority of the arid farmers did not supplement concentrate to their animal even in critical physiological stages. Sirohi is one of the best goat breed for arid and semi arid region of country. Supplementary feeding involving top feeds and scarce nutrients often recommended upon poor quality feeds based small ruminant feeding system (Shah *et. al.* (2003). It is well established that concentrate supplementation to young animals during active growth phase have promoted growth performance and provided heavier carcass (Tripathi *et. al.* 2007). Intensive rearing of goats is not a profitability proposition as it raises the cost of production. Supplemental feeding to the grazing goats may be possible way out of this situation. By feeding of good quality of concentrate we can fulfill requirement of both protein and energy. However, supplementing concentrate in addition to traditional feeding and management can improve the meat production potential of the kids. The present study was undertaken to assess the growth performance and economics of Sirohi kids under grazing with varying level of concentrate feeding management at farmers flock in arid condition of western Rajasthan.

Materials and Methods

A farm trial was conducted on farmer's goat flock maintained on community property resources situated at 26.2389509^o Latitude and 73.024305^o Longitude of Keru village during January to March, 2022 in the arid environment of Jodhpur district, Rajasthan under Indian Council of Agriculture Research (ICAR, New-Delhi) sponsored Schedule Cast-Sub Plan (SC-SP) project for Entrepreneurship and to strengthen their livelihood and economic improvement of Schedule cast youth through scientific goat farming. The temperature in the region varies 7 to 8^o C during winter and 40 to 45^o C during summer. A total of thirty male kids owned by the farmers at 90d old were selected and divided into three equal groups of 10 animals each and were grazed 8h on natural range land followed by high shelter inside opened and improvised animal shed. The vegetative cover of range land was dominated by *Cynodondactylon cenchrusbiflorus* grasses, *Zizyphus nummularia*, *Calotropis sp.*, *Procerasp*. Shrubs and fodder trees *Acacia nilotica* and *Prosopis cineraria* and *Azadirachta indica* was lopped and fed to the kids during grazing. The three groups were categorized as control group without supplementation feeding group (G-1), Concentrate feeding @1 % of body weight (G-2) and Concentrate feeding@ 1.5% body weight (G-3) at defined rate individually were provided concentrate mixture (Bajra (65%), barley bran (15%), tumba seed-cake (*Citrullus colocynthis*) (17%), mineral mixture (2%) and salt (1%) (Karim & Santra, 1998 and Lavania & Kumar, 2016). All the kids were sent for grazing in the morning and after return they offered concentrate mixture. The chemical composition of concentrate mixture is presented in table-1. The clean drinking water was offered *ad.lib.* daily. The feeding trial was continued for 90d and traits recorded for growth performance were initial weight, final weight, total body weight gain and average daily gain (ADG). The cost and returns of kids in different groups were worked out at prevailing market rates at the end of experimental period.

Table-1: Chemical composition (% DM basis) of concentrate mixture

Particular	Nutritive value (%)
Crude protein(CP)	12
Ether Extract (EE)	24
Crude Fiber (CF)	10
Nitrogen Free Extract (NFE)	55.19
Lignin	5.55

Source: Prepared and analyzed by author(s)

The clean drinking water was offered *ad.lib.* daily. The feeding trial was continued for 90d and traits recorded for growth performance were initial weight, final weight, total body weight gain and average daily gain (ADG).

Results and Discussion

Feeding of concentrate mixture resulted in a statistically significant ($P < 0.05$) improvement in growth of the kids of group G-2 and group G-3. Initial body weight of Sirohi kids before start of the study were 8.17 ± 0.05 , 7.98 ± 0.05 , 8.2 ± 0.05 kg in G_1 , G_2 and G_3 respectively as presented in Table-2.

Table-2 Growth performance and cost benefit analysis of kids

Attributes	G-1 Control	G-2 (1%)	G-3(1.5%)
Initial body weight (Kg)	8.17±0.05	7.98±0.05	8.2±0.05
Final body weight (Kg)*	12.02±0.03	14.50±0.04	15.61±0.04
Total body weight gain (Kg)*	3.85±0.24	6.52±0.32	7.41±0.46
Average daily gain (g)*	31.32±0.47	54.02±0.19	62.84±0.37
Concentrate mixture fed to kids in 90 days (Kg)	-	130	235
Cost of concentrate mixture @ ₹ 11.50/kg	-	1495	2703
Total live weight (Kid/gain)	120.2	145	156.1
Cost of live weight of kids @ ₹ 180/-kg	21,636	26,100	28,098
Net profit (₹)	21,636	24,605	25,395
Additional Income (₹)	-	2,969	3,759
Cost-benefit(₹/₹ spent)	-	1.99	1.39

*Group means differed statistically significant ($P < 0.05$)

It could be seen from the findings that the final body weight at the end of experiment was lowest in G-1 (12.02 ± 0.03 kg) and it was highest in G-3 (15.61 ± 0.04 kg). The average body weight gain at the end of experiment was higher ($P < 0.05$) in both the concentrate-supplemented kids than kids raised on grazing only, indicating the beneficial effect of feeding. The growth rate in the present study was higher than that reported in Mehsana male kids by Patel and Pande (2013). Mahanta *et al.* (2002) reported higher growth rate in local goats grazing in its native pasture supplemented with concentrate mixture. The lower body weight gain in the present study might be attributed to variability in experimental protocol mainly the quality and quantity of pastures available in the grazing area. Total body weight gain and average daily weight gain during this period increased with increasing concentrate offer up to 1.5% concentrate of their body weight. The results obtained in present trial are close proximity with Ryan *et al.* (2007) who reported the increasing concentrate levels in kid diet results in increased live weight, as well as carcass weight. In the present study net return from the body weight gain of ten kids in G-2 and G-3 group were ₹ 2,969 and ₹ 3,759, respectively. The feeding of concentrate was economical and a cost benefit could be generated on concentrate supplementation contrary to the general belief that feeding of concentrate increases the cost of production. Morales *et al.* (2000) also reported similar diminished production cost on account of concentrate supplementation in dairy goats.

Conclusion

The livelihood security of such resource poor farmers is real challenge. They have lack resources to initiate any venture besides the technical knowledge. The fear of risk involved with any live and capital intensive venture is beyond their capacity. This study was conducted to evaluate the effect of concentrate supplementation on growth performance and economics under field condition in Jodhpur district of Arid Rajasthan. On the basis of above results, it may be concluded that concentrate supplementation @ 1.5% of live weight along with free grazing for 8h was effective to augment growth of kids under field condition in arid conditions.

Acknowledgement

Authors are thankful to the principal Investigator of ICAR, New- Delhi funded Schedule Cast Sub Plan (SC-SP project), Agriculture University, Jodhpur for providing necessary facilities and logistics support for conducting this study. Authors are also thankful of goat breeders for participation in this study.

Conflict of Interest: Author declares that they have no conflict of interest

References

- 1) Choudhary, U.B., Das, A.K., Tripathi, P. and Tripathi, M.K. 2015. Effect of concentration of concentrate supplementation on growth performance, Carcass traits and meat composition of Sirohi kids under field condition. *Animal Nutrition and Feed Technology*, 15:251-260.
- 2) Karim, S.A. and Santra, A. 1998. Growth performance of Malpura and Malpura x Awassi Lamb on grazing with varying level of concentrate supplementation. Proceeding of the Golden Jubilee Seminar, Jaipur, India, 24th-26th April: 63-66.
- 3) Lavania, P. and Kumar, D. 2016. Effect of Concentrate feeding in Lamb. *Journal of Krishi Vigyan*, 5(1):26-28.
- 4) Mahanta, S.K., Pailan, G.H., Pachauri, V.C. and Verma, N.C. 2002. Influence of concentrate Supplementation performance of goats on rangeland. An On –farm study. *Animal Nutrition and Feed Technology*, 2:161-167.
- 5) Morales, A.R., Galina, M.A., Jimenez, S. and Haenlein, G.F.W. 2000. Improvement of bio sustainability of a goat feeding system with key supplementation. *Small Ruminant Research*. 35: 97-105.
- 6) Patel, A.C. and Pandey, D.P. 2013. Growth, Production and Reproduction Performance of Mehsana Goat. *Journal of Livestock Science* 4: 17-21
- 7) Ryan, S.M., Unruh, J.A., Corrigan, M.E., Drouillard, M.M. and Seyfert, M. 2007. Effects of concentrate level on carcass traits on Boer crossed bred goats. *Small Ruminant Research*, 73:67-76.
- 8) Shah, N., Mathur, M.M., Arora, N. and Mukherjee, S.K. 2003. The nutrient utilization and growth performance of Barbari kids fed tree leaves mixture with or without supplementation of concentrate mixture. *Animal Nutrition and Feed Technology*, 3: 2-7.
- 9) Tripathi, M.K., Chaturvedi, O.H., Karim, S.A., Singh, V.K. and Sisodiya, S.L. 2007. Effect of different level of concentrate allowances on rumen fluid PH, nutrient digestion, nitrogen retention and growth performance of weaner lambs. *Small Ruminant Research*, 72:78-186.