



ISSN: 2456-2912

VET 2024; 9(1): 160-162

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www.veterinarypaper.com

Received: 19-10-2023

Accepted: 30-11-2023

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Economic analysis of feeding COFS-29 on performance of non-descriptive goat kids of Hassan under intensive system

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Abstract

The study was conducted to assess the growth potentiality of non-descriptive goat kids of Hassan reared under an intensive system of management. Goat kids aged 3-4 months were selected, to estimate dry matter intake fed with COFS-29 as a sole roughage *source ad libitum* and concentrate feed mixture to meet the requirements as per ICAR 2013 at maintenance level (T₁) and to support 25 g/d (T₂), 75 g/d (T₃), and 125 g/d (T₄) daily body weight gain. The production cost of fodder was estimated and the cost per kg of concentrate feed mixture was determined. Fodder intake and concentrate intake was recorded every day, the composition of both roughage and concentrate was estimated, the weekly body weight of animals were recorded to estimate body weight gain. Total investment and return at the end of the trial was determined to assess the benefit cost ratio. The total input cost for the experimental duration of 90 days for T₁, T₂, T₃ and T₄ groups was Rs. 3562.9, 3642.3, 3989.7 and 4135.4 respectively. The total returns from the sale of goat kids and manure sold in T₁, T₂, T₃ and T₄ was Rs. 4398.7, 4874.5, 5857.8 and 6479.2, respectively and the corresponding benefit cost ratio was 1.2, 1.3, 1.5 and 1.6 respectively. Therefore it is concluded that feeding of *ad libitum* roughage and concentrate feed mixture at 75g/d was economically better to ac body weight gains and economic returns.

Keywords: Growth potentiality, economics, Hassan, Non-descriptive goat kids, B:C ratio

Introduction

The size of land holdings is shrinking daily as a result of the rising population, and urbanization thus, an increasing number of farmers are losing their farms or becoming landless. The socio-economic development of our nation is significantly influenced by farming. Goats are among the first farm animals to be domesticated even today. They play an important role in rural communities by improving the livelihood of resource-challenged farmers, creating alternative employment opportunities, enhancing family income by sale of live animals and manure. Goats remain disseminated all over the world because of their great adaptability to varying environmental conditions and different nutritional regimes under which they were evolved and subsequently maintained. The amount of available feed and fodder in India is insufficient to meet the rising ruminant population's need for dry matter. Currently 5 to 6 kg of green fodder per animal per day is available in India, which provides 7-8% of the dry matter needed by milk and meat-producing animals (Bakshi and Wadhwa, 2012) [2]. There is currently a net shortfall of 41% concentrate feed components, 35.6% green fodder, and 26.6% dry fodder (crop remnants) in the nation and only 3.81 percent of the state's total DM availability is from concentrates (ICAR, 2012) [4]. Therefore most of the livestock reared on crop residues as such or by enriching it with urea to improve the quality of feed as the poor quality unconventional sugarcane trash when subjected for urea ammoniation improved digestibility of sugarcane trash as *in vitro* results showed increased metabolizable energy, truly digestible organic matter and microbial biomass production (Jaishankar *et al.*, 2018) [7].

The dry matter intake of sole fed sugarcane trash as sole roughage source in Narisuwarna x Kenguri sheep was 1.48 percent and total dry matter intake was 2.39 percent when fed unconventional sugarcane trash as sole roughage source (Jaishankar *et al.*, 2017) [6].

Among the different accessible feed resources, COFS 29 perennial fodder might be considered one of the most important prospective crop available for ruminant feeding in the country, it serves as a 4F (food, feed, fodder, and fuel) crop. The area designated for fodder crops has greatly increased in the 21st century as a result of the enormous rise in demand for animal products, particularly under the feed industry. Because of these reasons the study was conducted to access the economics of the project and to work out the feasibility when fed with *ad libitum* COFS-29 as roughage source and concentrate at maintenance, 25g/d, 75g/d and 125g/d body weight gain.

Materials and Methods

The study was conducted to assess the growth potentiality of non-descriptive goat kids of Hassan reared under an intensive system of management. Goat kids aged 3-4 months were selected, to estimate dry matter intake fed with COFS-29 as a roughage source and to assess the nutrient digestibility as per ICAR 2013 [5] standards to meet maintenance level (T₁) and to support 25 g/d (T₂), 75 g/d (T₃), and 125 g/d (T₄) daily body weight gain. During the study the feed intake, digestibility of nutrients, nutrient utilization, feed efficiency and growth performance of non-descriptive goat kids and chemical analyses, feeding trial and metabolism trials was conducted. The experiment was carried out at the Department of Animal Nutrition, Veterinary College Hassan in collaboration with Department of Livestock Farm Complex, Veterinary College, Hassan, Karnataka, India. The input cost and returns was recorded to estimate the benefit cost ratio.

Results and Discussion

Chemical composition

The detailed chemical composition of COFS-29 and concentrate feed supplements used in growth trial are presented in Table 1. The chemical composition for COFS-29 were in accordance to Senthilkumar *et al.* (2009) [10] for crude protein (8.38%) and ether extract (2.62%) whereas Dombar *et al.* (2021) [3] reported similar results for dry matter (29.95%). Similar chemical composition was noticed by Ramachandra *et al.* (2002) [9] for sorghum stover for crude fiber (33.05%) and total ash (6.22%). The conventional perennial COFS-29 fodder composition is better against the proximate

composition of DM, OM, CP, EE, CF, NFE, TA, NDF, ADF and ADL content of unconventional sugarcane trash was 92.7, 88.6, 3.0, 1.5, 34.7, 49.4, 11.4, 79.1, 50.3 and 20.8 percent respectively (Jaishankar *et al.*, 2017) [6].

Table 1: Chemical composition (% DMB) of COFS-29 fodder and CFM

Proximate composition	COFS-29	Compounded feed mixture
DM	29.57	87.77
OM	93.36	93.72
CP	8.75	24.79
EE	2.34	3.67
CF	34.27	4.47
NFE	48.00	60.79
ASH	6.64	6.28
AIA	2.9	0.70

Economics of the project

The detailed economics of the projects presented in Table 2. The body weight gain were 1.41, 2.68, 5.09 and 6.69 in T₁, T₂, T₃ and T₄ respectively. As the concentrate feeding increased linearly there was a gradual decrease in roughage intake. The same trend was followed by Jaishankar *et al.* (2021) [4] on Kenguri lambs due to linearly increase in CFM proportion to meet the required gain. The total feed cost for T₁, T₂, T₃ and T₄ group was Rs. 316, 385.4, 717.8 and 848.5 per kg respectively. The total input cost for the experimental duration of 90 days for T₁, T₂, T₃ and T₄ groups was Rs. 3562.9, 3642.3, 3989.7 and 4135.4 respectively. The total returns from the sale of goat kids and manure sold in T₁, T₂, T₃ and T₄ was Rs. 4398.7, 4874.5, 5857.8 and 6479.2, respectively and the corresponding benefit cost ratio was 1.2, 1.3, 1.5 and 1.6 respectively.

The results indicated that benefit cost ratio was higher in T₃ and T₄ when compared to T₁ and T₂ as feeding animal at 75 and 125g gain per day in T₃ and T₄ groups respectively which shown better growth performance and was more economical for commercial goat production under stall fed condition, and farmers would be more benefited rather than using sole roughage source in growing goat kids. Similar findings were observed by Ahmed *et al.*, 2020 [1] under stall fed condition when fed in the form of complete pellet feed.

Table 2: Economics of feeding non-descriptive goat kids of Hassan during feeding trial

Particulars	T-1	T-2	T-3	T-4
Average initial BW (kg)	9.25	9.24	9.26	9.25
Final BW (kg)	10.66	11.91	14.34	15.94
BW gain. kg for 90 days	1.41	2.68	5.09	6.69
variable cost				
Kids cost (3 m age) Rs.	3000.0	3000.0	3000.0	3000.0
Labour cost for 90 d (1hr/day, wages @350/day) Rs.	196.9	196.9	196.9	196.9
Roughage intake kg/kids for 90 d	130.0	133.2	108.7	104.0
CFM intake kg/kids for 90 d	1.6	3.4	14.3	18.3
Roughage cost Rs.2/kg DM	260.0	266.4	217.5	208.0
CFM@R35 /kg	56.0	119.0	500.3	640.5
Total feed cost in Rs.	316	385.4	717.8	848.5
Vet, cost & miscellaneous	50.0	60.0	75.0	90.0
Total variable cost	3562.9	3642.3	3989.7	4135.4
Revenues				
kids sold value @Rs.400/kg live BW	4264.0	4764.3	5738.0	6377.0
Manure cost@Rs.5/kg	134.7	110.2	119.8	102.2
Total revenues in Rupees	4398.7	4874.5	5857.8	6479.2
Total gross margin in Rs.	835.8	1232.2	1868.1	2343.8
Benefit cost ratio	1.2	1.3	1.5	1.6

Conclusion

The perennial fodder COFS-29 can be utilized as a good quality roughage source having no adverse effects on goats kids. As the concentrate feeding increased to meet the growth requirements the roughage intake was reduced. The B:C ratio was higher in T₃ and T₄ treatment groups for 75g/d and 125g/d body weight gain. Therefore it is concluded that feeding of *ad libitum* CoFS-29 as roughage source and concentrate feed mixture to meet 75g gain/day as per ICAR 2013 [5] was economically better to achieve higher body weight gains for better economic returns.

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