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Preetam Sangam

MVSc. Scholar, Department of Animal Nutrition, Veterinary College, Hassan, KVAFSU, Bidar, Karnataka, India

Hayavadana GR

MVSc. Scholar, Department of Animal Nutrition, Veterinary College, Hassan, KVAFSU, Bidar, Karnataka, India

Jaishankar N

Professor, Department of Animal Nutrition, Veterinary College, Hassan, KVAFSU, Bidar, Karnataka, India

Chethan KP

Associate Professor (i/c), Department of Livestock Farm Complex, HVC, KVAFSU, Bidar, Karnataka, India

Shivakumar MC

Dean (i/c), Veterinary College, Hassan, KVAFSU, Bidar, Karnataka, India

Naveen Kumar GS

Professor, Department of Animal Genetics and Breeding, VCH, KVAFSU, Bidar, Karnataka, India

Sathisha KB

Associate Professor (i/c), Livestock Research and information centre (Sheep), Nagamangala, Karnataka, India

Corresponding Author:

Preetam Sangam

MVSc. Scholar, Department of Animal Nutrition, Veterinary College, Hassan, KVAFSU, Bidar, Karnataka, India

Perennial fodder COFS-29 as sole roughage source in non-descriptive goats kids of Hassan under intensive rearing system

Preetam Sangam, Hayavadana GR, Jaishankar N, Chethan KP, Shivakumar MC, Naveen Kumar GS and Sathisha KB

Abstract

Twenty non-descriptive goats kids of Hassan (age: 3-4 months; average body wt. (7.97 kg) were housed in individual cages at the experimental animal shed, LFC, Veterinary College, Hassan. The pilot study was conducted for duration of 24 days. COFS-29 was freshly chopped daily and was fed to animals *ad libitum*. The daily allowance of 50g concentrate feed mixture was weighed and offered twice a day at 12.00 AM and 4.00 PM. Roughage and concentrate intake was recorded and total matter intake was calculated and presented per kg metabolic body weight and percent body weight. The nutrient composition was on par with maize fodder. Daily roughage dry matter intake was 136.99g, which was 1.68 percent body weight and 24.85g per kg metabolic body weight. Similarly the concentrate dry matter intake was 43.89 g per day, 0.5 percent body weight and 9.07 g per kg metabolic body weight. The total dry matter intake was 180.88 g per day, 2.23 percent body weight and 37.52 g per kg metabolic body weight was observed. The concentrate feed was restricted during the pilot study to maximize the roughage dry matter intake. the nutrients consumed could meet the maintenance requirement. Hence, concluded that the CoFS-29 fodder can be used as a sole roughage source to conduct further studies on assessment of growth potentiality of non-descriptive goat kids of Hassan.

Keywords: CoFS 29, Hassan, intensive system, non-descriptive goat kids

Introduction

The goat proves that it is "the poor man's cow." Goats have a shorter generational gap than cattle, which allows them to reach higher levels of productivity more quickly. They fit within the means of the low-income group due to their tiny size and relatively low individual price. Larger animals' rearing, such as cattle and buffaloes, is getting harder every day. Smaller animals with fewer needs, like goats, provide a profitable economy in this situation by supplying milk and meat. Natural grasslands, fertile wastelands, and unproductive fields have traditionally been India's primary sources of green fodder for livestock. However, the majority of India's grassland is home to grasses with poor nutritional value and little fodder-producing capacity. 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) [5]. Among the different accessible feed resources, CoFS 29 might be considered one of the country's most important protective crops available for ruminant feeding, 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 in the feed industry. Although sorghum is primarily grown for its grain and energy, it is also frequently utilized to produce forage and silage for animal feed because of its wider leaves and thin stem, highly palatable leaves, which supply green fodder for longer.

Materials and Methods

Twenty non-descriptive goats kids of Hassan (age: 3-4 months; average body wt. (7.97 kg)

were housed in individual cages at the experimental animal shed, LFC, Veterinary College, Hassan. The pilot study was conducted for a duration of 24 days. COFS-29 was freshly chopped daily and was fed to animals *ad libitum*. The daily allowance of 50 g concentrate feed mixture was weighed and offered twice a day at 12.00 AM and 4.00 PM. The leftover feed was recorded on the next day at 9.00 AM. Clean drinking water was provided to all the animals twice a day at 10.30 AM and 3.00 PM. All the goats were weighed once a week during morning hours on a digital electronic weighing balance of 200 kg capacity, weight was recorded each week before offering feed or water. The samples of feed offered were collected weekly for determination of dry matter.

Chemical analyses

The feed and fodder samples were analyzed for proximate analysis as per AOAC, 2005 [2].

Results and Discussion

Chemical composition

The chemical composition (percent dry matter basis) of COFS-29 and the concentrate feed mixture is presented in the table 1. The proximate composition DM, ASH, AIA, EE, CF, CP, and NFE for COFS-29 was 29.57, 6.64, 2.09, 2.34, 34.27, 8.75, and 63.24 and for concentrate mixture was 87.77, 6.28, 0.7, 3.67, 4.47, 24.79, and 91.56 respectively. Similar observations were noticed by Remya Nair *et al.*, (2019) [9] for concentrate mixture i.e 91.42%, 20.56%, 12.92%, 5.76%, 57.79%, and 7.80% for dry matter, crude protein, crude fiber, ether extract, nitrogen free extract, and total ash respectively. Bhoyarkar *et al.*, 2020 [3] analysed for Sorghum kadbi and found higher DM and TA i.e., 90.03 ± 0.04 and 9.73 ± 0.03 and lower values i.e 2.10 ± 0.05, 1.76 ± 0.02, 32.00 ± 0.04, 54.41 ± 0.06 in CP, EE, CF, and NFE respectively.

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

Proximate composition	COFS-29 fodder	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

Body weight and dry matter intake

The average body weight and dry matter intake of roughage and concentrate were presented in Table 2. The average body weight and metabolic body weight of 20 goat kids was 8.18 kg and 1.722 kg respectively. The average roughage dry matter intake, roughage DMI percent body weight and roughage DMI W^{0.75} was 136.99 g, 1.68 percent, 28.45 g/kg respectively. The average concentrate DMI, concentrate DMI percent body weight and concentrate DMI W^{0.75} was 43.89 g, 0.51 percent, 9.07g respectively. The average total DMI, total DMI percent body weight and total DMI W^{0.75} was 180.88 g, 2.23 percent, 37.52 g respectively. Higher daily weight gain was noticed by Ahmed *et al.*, 2020 [1] on 18 goats fed with *ad libitum* oat grass with T₁ - fed *ad libitum* oat grass reared intensively. T₂ - fed *ad libitum* oat grass and *ad libitum* Urea molasses straw (UMS) with concentrate supplementation (at 1.5% of body weight) and T₃ - was fed *ad libitum* developed

complete pellet feed reared intensively. The Daily weight gain (g) recorded was 33.80, 34.78, and 50.29 for T₁ T₂, and T₃ respectively but he noticed a lower DMI (kg/day) i.e 0.264, 0.245, and 0.272. The DMI (% body weight) was 3.25, 3.03, and 3.06 for T₁ T₂, and T₃ respectively.

The concentrate feed supplement is restricted to 50g per animal since, overfeeding of concentrate feed mixture can reduce roughage intake as reported by Jaishankar *et al.*, 2021 [6]. The total dry matter intake (g/d), on % body weight and on metabolic body weight (g/kg BW^{0.75}) were significantly improved as increase in the supplementation of concentrates to meet expected daily gains. But significantly lower DMI from roughage was observed with the increased proportion of CFM in the diets as this could not be avoided as roughage and CFM were fed separately in NariSuwarna × Kenguri F1lambs.

Table 2: DMI of COFS-29 in non-descriptive goat kids of Hassan

Average b.wt	8.18
Daily body wt gain (g)	7.87
RDMI (g)	136.99
RDMI % B.wt	1.68
RDMI W ^{0.75}	28.45
CDMI (g)	43.89
CDMI % B.wt	0.51
CDMI W ^{0.75}	9.07
TDMI (g)	180.88
TDMI % B.wt	2.23
TDMI W ^{0.75}	37.52

Bhoyarkar *et al.*, 2020 [3] noticed lower average body weight gain (kg) was i.e 1.11, 1.21, and 1.25 when fed with T₁ - 50 percent DCP from green Maize fodder ± 50 percent DCP from Concentrate mixture ± *ad lib* Sorghum *kadbi*, T₂ - 50 percent DCP from green Marvel grass ± 50 percent DCP from Concentrate mixture ± *ad lib* Sorghum *kadbi*, and T₃ - 50 percent DCP from green DHN-6 fodder ± 50 percent DCP from Concentrate mixture ± *ad lib* Sorghum *kadbi*. Higher DMI was noticed when Khaing *et al.*, 2015 [8] allotted Fifteen Boer crossbred male goats with diet consisting of 60% forage and 40% concentrates. The five treatment groups were made up of the various proportion of Napier grass - G and whole corn plant silage - CS: T₁ - 100:0, T₂ - 75:25, T₃ - 50:50, T₄ - 25:75 and T₅ - 0:100. The Daily DMI (g, DM) was 276.8, 338.9, 380.7, 406.6, and 464.4 this was due to higher palatability, good fermentation characteristics and due to the chemical composition of the whole corn plant silage which had lower cell wall content and high amount of fermentable carbohydrate and energy, which increased the digestibility. The dry matter intake of sole fed sugarcane trash as roughage source in Narisuwarna x Kenguri sheep was 1.48 percent and total dry matter intake was 2.39 percent. Whereas, in complete diets the total dry matter intake was 3.36 percent, that indicates the poor quality roughage source like sugarcane trash can be used as roughage source as such or in mixed diets to prevent scarcity of fodder (Jaishankar *et al.*, 2017) [4].

Table 3: Nutrient requirements for goat kids as per ICAR 2013

	Body Weight (kg)	CP(g)	TDN (g)	DMI (g)
Maintenance	8.18	27.89	145.45	296.83
25g/d		39.54	186.00	296.88
75g/d		61.99	265.90	314.32
125g/d		86.01	336.14	355.18
Nutrients consumed per animal during pilot study				
Nutrients met during pilot study		22.87	153.74	180.88

Conclusion

The nutrient requirements level as per ICAR 2013 for the average 8.18 body weight from the preliminary study for 25, 75, and 125 gain/day are presented in Table 3 and the requirements (g) met by the kids under this preliminary study is 22.87, 153.74, 180.88 g for crude protein, total digestible nutrients and dry matter intake respectively. Therefore, from pilot study it is concluded that, the perennial fodder can be used as sole roughage source to feed livestock, further studies are required to assess the digestibility of nutrients and nutritive value of roughage source.

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