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Utilization of perennial fodder COFS-29 as sole roughage source in Hassan sheep lambs under Intensive rearing system

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Abstract

Twenty sheep lambs of around 3 to 7 months of age with an average body weight of 10.91kg were selected and divided into four groups of five replicates each. Each group was randomly allotted to one of the four dietary treatments. This pilot study was carried out to assess the feed intake of Hassan sheep Lambs when fed with green fodder COFS 29 as a sole roughage source and concentrate separately to meet the requirements according to ICAR nutrient requirements 2013. 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. Daily roughage dry matter intake was 456.42 g, which was 4.18 percent body weight and 76.03g per kg metabolic body weight. Similarly the concentrate dry matter intake was 43.89 g per day, 0.4 percent body weight and 7.31 g per kg metabolic body weight. The total dry matter intake was 500.30g per day, 4.59 percent body weight and 83.34 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 Hassan Sheep lambs.

Keywords: CoFS 29, Hassan, intensive system, sheep lamb, intensive system

Introduction

In Karnataka, livestock is one of the most important subsistence occupations, contributing to agricultural revenue regardless of land holdings. Livestock progress and profitability are dependent on the availability of green fodder. Green fodder is necessary for sustained livestock production, but its production is being hampered for a variety of reasons. A crucial part is played by the lack of area for producing fodder, the lack of high-quality fodder, and the unfavorable climate conditions. 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) [6].

Indigenous breeds with qualities like heat tolerance, disease resistance, ability to survive and produce under stressful and low input conditions need to be conserved for future use as mentioned by (Hussain *et al.*, 2022) [3]. Hence sheep and goats are treated as “moving banks” at rural places for immediate cash revenue. Thus livestock plays a vital role in enhancing the economic viability and sustainability of farming systems. Therefore, lack of adequate balanced feeding is the main constraint in obtaining maximum productivity and profit from sheep farming in the extensive system. There is a need to generate information on growth performance in field conditions which will be helpful to as many individuals for the development of an entrepreneurial system for sheep by the larger stakeholders hence, the pilot study was conducted.

Materials and Methods

Twenty sheep lambs of around 3 to 7 months of age with an average body weight of 10.91kg were selected and divided into four groups of five replicates each. Each group was randomly allotted to one of the four dietary treatments. This pilot study was carried out to assess the feed intake of Hassan sheep lambs when fed with green fodder COFS 29 as a sole roughage source and concentrate separately to meet the requirements according to ICAR nutrient requirements 2013 wherein it included feeding trial and experimental trial which was conducted at Livestock Farm Complex. Uniform managemental care like deworming, vaccination etc., was under taken under stall fed condition.

Sorghum was used as a major roughage source it is closely related to maize in terms of composition, amino acid concentration, and nutritional value. Realising the importance sorghum was selected among non leguminous fodder crop and was cultivated in the LFC farm complex. The grown fodder was chopped around 4cm and utilized for animal trial as roughage source. The ingredients like maize, soybean meal, sodium bicarbonate, dicalcium phosphate, mineral mixture, toxin binder, salt and vitamin supplements for concentrate preparation were procured from local market. The roughage Sorghum green fodder was offered *ad libitum*, average roughage intake of individual animal, the quantity of concentrate feed supplied was adjusted to meet the specific growth requirements as recommended by ICAR (2013). The chemical composition of the roughage and the CFM were analyzed before commencement of feeding trial. The daily allowance of CFM was weighed and offered twice a day at 10:00 AM and 5:00 PM. The left over feed was recorded on the next day at 8.30 AM every day. Clean drinking water was provided at free of choice to all the animals thrice a day at 9.00 AM, 1.00 PM, and 5.00 PM

Results and Discussion

Chemical composition

The chemical composition (percent dry matter basis) of COFS- 29 green fodder and concentrate feed supplements were presented in Table1. The chemical composition includes proximate analysis. The proximate composition DM, ASH, AIA, EE, CF, CP, NFE was 30.33, 6.64, 2.09, 2.34, 34.27, 8.75, 48.00 and that of concentrate was 87.77, 6.28, 0.70, 3.67, 4.47, 24.79, 60.79 respectively. Ash, EE, NFE were 2.97, 6.94 and 61.24 comparable with the Sorghum, Another study from Olomu (1995)^[10]. revealed CP of Maize was 8.8 which was comparable with the green fodder COFS- 29 nutrient composition. DM varied because of the variation in stage of cut. Concentrate feed (90.7% DM) was prepared from 14.6% ground maize, 34.8% wheat bran, 49.6% noug

seed (*Guizotia abyssinica*) cake and 1% common salt (on DM basis) by Getahun *et al.*, 2020 ^[2] also revealed the same composition. the untreated sugarcane trash had 3% CP whereas the urea ammoniated sugarcane trash has higher crude protein (11.98) as reported by Jaishankar *et al.*, (2017) ^[5] which can be comparable with COFS-29 fodder.

Table 1: Chemical composition of CoFS-29 green fodder and Concentrate feed mixture

Proximate composition	Roughage	Concentrate
DM %	30.33	87.77
ASH	6.64	6.28
AIA	2.09	0.70
EE	2.34	3.67
CF	34.27	4.47
CP	8.75	24.79
NFE	48.00	60.79

Body weight and dry matter intake

The mean body weight and dry matter intake of roughage and concentrate is given in the Table 2. DMI of green fodder CoFS-29 and CFM by Hassan sheep lambs. The mean body weight, daily weight gain, RDMI, CDMI, TDMI were 10.91kg, 158.75g, 456.42g, 43.89g and 500.3g respectively. The mean RDMI % B.wt and RDMI W^{0.75} similarly, CDMI % B.wt and CDMI W^{0.75} were 4.18 and 76.03; 0.40 and 7.31 respectively. the total dry matter intake percent body weight was 4.59% and 83.34 g /kg metabolic body weight. These results were corroboration with several authors type of the feed offered to the animal is the major factor in the variation of DMI. Results were similar to Jaishankar *et al.*, (2021) ^[7] who studied on effect of unconventional sugarcane trash based complete diets on performance of sheep.

According Khalasi *et al.*, (2010) ^[8] to fed a control diet of Rhodes grass hay (RGH) plus a commercial concentrate: Average daily hay intake was 454g which was comparable with this study. Fayed *et al.*, (2009) ^[1] studied on effect of feeding Olive Tree Pruning Pruning by-products wherein CFM +olive leaves and twigs treated with urea and Daily gain was - 143.66 due to effect of urea or biological treatments on microbial productivity and the digestion of organic matter is what causes an increase in daily gain was comparable. Also Getahun (2014) ^[2] studied on effect of wheat straw urea treatment and *Leucaena Leucocephala* foliage hay supplementation growth of Ethiopian highland lambs. (T-2) urea treated wheat straw total DMI was 566.7, Dry matter intake was seemed to be higher with the lambs fed on sole urea treated straw comparatively and also supplementing LL in the diet increased CP, ash, EE, Ca, P and fiber fractions.

Table 2: Dry matter intake of COFS-29 in Hassan Sheep Lambs

Average b.wt	10.91
Daily body wt gain (g)	158.75
RDMI (g)	456.42
RDMI % B.wt	4.18
RDMI W ^{0.75}	76.03
CDMI (g)	43.89
CDMI % B.wt	0.40
CDMI W ^{0.75}	7.31
TDMI (g)	500.3
TDMI % B.wt	4.59
TDMI W ^{0.75}	83.34

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) [5].

Table 3: Nutrient requirements for Hassan Sheep Lambs as per ICAR 2013

	Body Weight (kg)	CP(g)	TDN (g)	DMI (g)
Maintenance	10.91	44.6	233.8	419.6
50g/d		62.8	263.1	431.0
100g/d		85.6	311.6	453.5
150g/d		109.0	359.5	513.5
Nutrients consumed per animal during pilot study				
Nutrients met during pilot study		50.83	351.12	500.3

The nutrient requirements level as per ICAR 2013 for the average body weight of 10.91kg for 50, 100, and 150g gain/day are presented in Table 3 and the requirements(g) met by the Hassan sheep lambs under this preliminary study is 50.83, 351.12, and 500.3 g for crude protein, total digestible nutrients and dry matter intake respectively.

Conclusion

The report of pilot study in Hassan sheep lambs with *ad libitum* intake of CoFS-29, the roughage dry matter intake itself was 4.18% body weight with restricted feeding of concentrate at the rate of 50g per animal per day. Which was sufficient to meet 50 g gain per day as per nutrient requirements specified by ICAR 2013. Therefore, it is concluded that, the perennial fodder CoFS-29 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 in Hassan sheep lambs.

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