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Economic analysis of feeding perennial fodder COFS-29 as sole roughage source on performance of Hassan sheep lambs

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Abstract

The present study was conducted for a period of 90 days with twenty Hassan sheep lambs aged 3- 4 months age divided into four groups of five animals each. Each group was randomly allotted to one of the four dietary treatments in a complete randomized design. Under stall-fed conditions, uniform management care like as deworming and vaccinations were administered as per the standard procedures. To assess the growth potential of Hassan sheep lambs reared under an intensive system of management. The experimental animals were fed in accordance with ICAR, (2013), at maintenance levels (T₁) and to support daily body weight gains of 50 (T₂), 100 (T₃), and 150 g (T₄). The required nutrients was supplied through multicut fodder sorghum (CoFS-29) as a sole source of roughage and compounded feed mixture with varying quantities based on the previous week's DM intake. The total investment and the return generated was recorded and the calculated benefit cost ratio was 1.3, 1.4, 1.6 and 1.5 respectively in T₁, T₂, T₃ and T₄ groups. Benefit cost ratio was higher in T₃ and T₄ when compared to T₁ and T₂. It was concluded that the growth potentiality of Hassan sheep lambs was 90.69 g/d. Hence, recommended to feed Hassan sheep lambs to achieve 100 g gain per day as per ICAR, (2013) under intensive system with good management practice for better economic returns.

Keywords: Hassan lambs, growth potentiality, economics, Hassan, B:C ratio

Introduction

The proper supply of feed and fodder is required for the growth of the animals. Forages typically make up the majority of ruminant feeds, and high-quality nutritious green fodder is needed to exploit potentiality of ruminants was opined by (Datta, 2013) [3]. It is very much necessary to overcome forage shortage to meet the demand of current livestock production and ensure green fodder availability throughout the year. 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]. Hence cultivation of newer varieties of perennial fodders with higher biomass per unit area and the preservation of excess forage as silage was opined by Khaini *et al.*, (2015) [8], High protein diets are necessary for lambs to ensure high production and rapid growth. The higher concentrate diet with larger energy content, enable lambs to express their full genetic potential for growth and have quick rates of body protein deposition, which leads to early lean deposition and enhanced body fat deposition. Indian lambs produce 40 to 50 g of Average Daily Gain in their most active growth phase using conventional settings without planned inputs (Shinde *et al.* 2008) [11]. COFS-29 green fodder was cultivated and used as a sole roughage source along with compounded feed mixture, according to ICAR (2013) at maintenance levels and to support daily body weight gains of 50, 100, and 150 g/d. The economics of the project was assessed to work out the feasibility of the entire project.

Materials and Methods

The experiment was carried out at the experimental animal shed, Department of Animal Nutrition, Veterinary College Hassan in Collaboration with Livestock Farm Complex, Veterinary College, Hassan to assess the growth performance of Hassan sheep lambs and also to evaluate the economic feasibility of the project. The experiment was conducted for a duration of 90 days in twenty Hassan sheep lambs and divided into four dietary treatment groups of five lambs each. Each group were randomly allotted to one of the four dietary treatments T₁, T₂, T₃, and T₄ in a complete randomised design. Uniform managerial care like deworming, vaccination etc., were done as per standard procedure under Intensive rearing system. *Ad libitum* roughage was fed to lambs and concentrates supplemented as per ICAR (2013) to meet maintenance levels and to support daily body weight gains of 50, 100, and 150 g respectively in T₁, T₂, T₃ and T₄ group.

Results and Discussion

Chemical composition

The chemical composition of roughage COFS-29 and CFM prepared for feeding experimental Hassan sheep lambs during the growth trial is presented in Table 1.

Table 1: Chemical composition of (%DMB) of roughage and compounded feed mixture

Proximate composition	Roughage COFS-29	Compounded feed mixture
DM %	30.33	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	2.09	0.7

The results of the proximate analysis of the green fodder COFS-29 were comparable to values for wheat straw reported by Bendary *et al.* (2002)^[2]; Akinfemi *et al.* (2009b)^[1] noticed nutrient profile for maize which was lesser in its chemical composition compared to sorghum used in the present study. Similar results were observed by Kalyana Chakravarthi *et al.* (2017)^[7], Manjunath *et al.* (2014)^[9], However Ram Rajitwad *et al.* 2020^[10], reported that the proximate composition of perennial fodder sorghum (Heera variety) was comparable with COFS-29 sorghum. The untreated sugarcane trash had only 3% CP whereas the four per cent urea treated urea ammoniated sugarcane trash has higher crude protein (11.98) as reported by Jaishankar *et al.*, (2017)^[4] which can be comparable with COFS-29 fodder.

Economics of the project

The detailed economics of the project as total investment and returns were presented in Table 2. The body weight gain in various treatments were 2.1, 3.7, 7.7, 8.3 kg respectively in T₁, T₂, T₃ and T₄. As the concentrate feeding increased linearly there was a gradual decrease in roughage intake. The same trend was followed by Jaishankar *et al.* (2021)^[6] on Kenguri lambs due to linearly increase in CFM proportion to meet the required gain. Welday (2014)^[12] conducted trial on male Black head Ogaden sheep (561.9 g/d to 367.2 g/d) found similar trend in RDMI. The total gross margin was 1090.9, 1730.9, 2973.0 and 2969.6 rupees per animal respectively in

T₁, T₂, T₃ and T₄. The Benefit cost ratio in the order highest to lowest as 1.6, 1.5, 1.4 and 1.3 respectively in T₃>T₄>T₂>T₁ group. Feeding Hassan sheep lambs for 100 g daily gain as per ICAR (2013) is more economical and also profitable compared to other treatment groups.

Table 2: Economics of the project

Particulars	T ₁	T ₂	T ₃	T ₄
Average initial BW (kg)	11.5	12.3	12.3	12.3
Final BW (kg)	13.6	16.0	19.9	20.6
BW gain. kg for 90 days	2.1	3.7	7.6	8.3
Variable cost				
Lamb cost (3 m age) in Rs	3500.0	3500.0	3500.0	3500.0
Labour cost for 90 d (1hr/day, wages @ Rs 350/day)	197.0	197.0	197.0	197.0
Roughage intake kg/lambs for 90 d	308.6	298.2	280.5	209.9
CFM Intake kg/lamb for 90 d	3.2	13.1	23.5	34.7
Roughage cost 2/kg DM	617.3	596.5	561.0	419.7
CFM @ R35 /kg	112.0	457.6	823.0	1213.4
Total feed cost	729.3	1054.1	1384.0	1633.1
Vet, cost & miscellaneous	50.0	50.0	50.0	80.0
Total variable cost	4476.3	4801.1	5131.0	5410.1
Revenues				
lambs sold value @ 400/kg live BW	5438.0	6409.0	7970.0	8239.0
Manure cost @ 5/kg	129.2	123.0	134.0	140.6
Total revenues	5567.2	6532.0	8104.0	8379.6
Total gross margin	1090.9	1730.9	2973.0	2969.6
Benefit cost ratio	1.3	1.4	1.6	1.5

^{abcd} Mean values in a row bearing different superscripts differ significantly ($p < 0.05$)

Conclusion

The perennial fodder COFS-29 can be utilized as a good quality roughage source having no adverse effects on Hassan sheep lambs. As the concentrate feeding increased to meet the growth requirements the roughage intake was reduced. The maximum body weight and average body weight gains was observed in T₄ (90.69 g/d) when fed to gain 150 g/d. Benefit cost ratio was higher in T₃ and T₄ when compared to T₁ and T₂. It was concluded that the growth potentiality of Hassan sheep lambs was 90.69 g/d. Hence, recommended to feed Hassan sheep lambs to achieve 100 g gain per day as per ICAR, (2013) under intensive system with good management practice for better economic returns.

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