

Comparative Growth Performance of Deccani Lambs Under Various Rearing Systems in Agro-ecological Conditions of Konkan

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ABSTRACT

The experiment was carried out during winter season (Dec-March) to study comparative growth performance of Deccani lambs under different rearing systems. Twelve Deccani lambs of 3 months age were randomly allocated into three groups of four lambs each viz., T₁ (Grazing), T₂ (Semistallfed), T₃ (Stallfed). T₁ lambs were maintained on 6-7 hrs grazing (100%) with supplementation of concentrate mixture at night as maintenance ration. Both T₂ and T₃ lambs were reared on green roughages of green maize (*Zea mays*) and Shivan (*Gmelina arborea*) tree leaves with concentrate mixtures for maintenance. The dry matter intake, average daily gain in body weight, body length, body height, chest girth and total greasy fleece yield was significantly higher (P < 0.01) in stallfed system than grazing and semistallfed systems. The higher intake of dry matter in T₃ (Stallfed) lambs was observed than the lambs reared under the other two systems. Considering superior growth performance of Deccani lambs under stallfed system, present study concludes that, the sustainable lamb production could be promoted in stallfed (Intensive) system in Konkan region of Central India.

Keywords: Sheep, Housing system, Growth performance, Greasy fleece yield

INTRODUCTION

The central part of India has a much diversified climate. Majority of the area in this part falls under rainfed agriculture; hence there is a serious problem of uniform supply of fodder to the farm animal throughout the year. The sheep rearing has multiutility value and plays an important role in national economy. Sheep graze close to the ground so they are called as weed killers or ground cleaners, and also have a high digestibility. There is thus large scope in this farming for employment opportunities for skilled workers along with landless labours. Therefore, sheep farming is widely considered as one of the poverty elevating enterprise (Dastagiri and Rao 1990).

In Konkan region of India, sheep rearing is not practical on a large scale due to high rainfall and humidity conditions. However, it is observed that the shepherds migrate from upghat areas to Konkan region for grazing of sheep on natural pastures and stubbles in the field of paddy harvested crops. This indicates that profitable sheep rearing could be possible in this region, provided due care is taken especially during rainy season. Therefore, present

investigation was carried out to study the growth performance and economics of sheep rearing under three different rearing systems in Konkan region of India.

MATERIALS AND METHODS

The experiment was carried out during winter December 2008 to March 2009 in experimental farms of Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli (Dist. Ratnagiri); Maharashtra. The study was conducted on twelve (3 month old) Deccani lambs weighing between 14 to 16 kg. The lambs were housed in grazing, semistall and stallfed systems of rearing. The lambs were provided with good quality drinking water. Prophylactic measures against sheep diseases like sheep pox, ticks mites, lice, endo and ectoparasitic infestations were carried out. Further, the lambs were randomly allocated into three groups of four Deccani lambs (3 months of age) each namely, T₁ (grazing), T₂ (semi stallfed) and T₃ (stallfed) systems. Care was taken while grouping the animals to ensure that lambs were even aged and there were no significant

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changes between groups on average body weight before start of the experiment. T₁ group (grazing) was maintained purely (100%) on grazing for 6-7 hrs on surrounding hortipastoral areas. The T₂ lambs (semi stalled) were maintained on grazing (50%) and stall-fed (50%) conditions with supplementation of concentrate mixtures for maintenance. T₃ lambs (stallfed) were completely maintained in the shed with green maize (*Zea mays*) harvested at flowering stage used as green roughages and jowar kadbi as dry roughages. Shivan (*Gmelina arborea*) tree leaves were also provided as green roughages for T₂ (semistallfed) and T₃ (stalled) systems. The concentrate mixture was provided to the lambs under three systems in afternoon and evening for maintenance ration. The quantity of concentrate mixture was calculated at the rate of one third of the total dry matter required for their body weight.

The observations were recorded at weekly intervals for body weight of lambs, fortnightly for body length, body height and chest girth. The left over quantity of roughages and concentrate mixture were measured the next morning to get actual intake of feeds and only concentrate mixture for T₁ (grazing). The dry matter intake was calculated with help of actual intake of feeds and concentrate mixture was multiplied by the dry matter content of feeds offered in all three systems. The average greasy fleece weight was calculated in grazing, semistallfed and stallfed system after lambs attained six months of age i.e. slaughter age. The feed cost per kg gain in body weight under three systems was worked out, considering the current prices.

All the data were subjected to statistical analysis by using one way ANOVA. Statistical software SPSS 13.0 for windows (SPSS Inc. 2004) was used for overall statistical analysis. Differences between treatments were analyzed using ANOVA at a significance level of 0.05. Afterwards, Tukey HSD (Tukey's Honestly Significant Difference) test was used to find out the significant differences between mean values.

RESULTS AND DISCUSSION

Overall results are presented in Table 1. The total dry matter intake per day per lamb was found to be 573.27 + 10.25 g for grazing, 676.07+38.76 g for semistallfed and 710.35+ 31.19 g for stallfed

systems. The average dry matter intake per day per lamb was significantly higher ($P < 0.01$) in stallfed system than others. The dry matter intake per 100 kg body weight was observed to be maximum in stallfed system (3.86 + 0.156 kg.) followed by semistallfed (3.41 + 0.192 kg) and grazing (2.94 + 0.056 kg) system. Our results are in conformities with the results obtained by Krishnamohan and Naidu (1984) and Solanki (1990).

Table 1. Growth performance of Deccani lambs under different management systems

Parameters	Grazing	Semi-stallfed	Stallfed
Initial body weight (kg)	15.0 ± 1.64	14.92 ± 0.63	14.95 ± 1.17
Final body weight (kg)	17.02 ± 1.44	17.52 ± 0.62	18.40 ± 0.41
Total gain in body weight (kg)	2.02 ± 0.265 ^{bc}	2.02 ± 0.117 ^{ab}	3.45 ± 0.81 ^a
ADG in Body weight (g/day lamb)	22.50 ± 2.95 ^b	28.89 ± 1.30 ^{ab}	38.33 ± 8.99 ^a
Dry Matter Intake (g)	573.27 ± 10.25 ^b	676.07 ± 38.76 ^{ab}	710.35 ± 31.19 ^a
Dry Matter Intake (g), % Body weight (kg)	2.94 ± 0.056 ^b	3.41 ± 0.92 ^{ab}	3.86 ± 0.156 ^a
Body Measurement	8.77	9.07	9.92
Body length (cm)	± 0.32 ^b	± 0.56 ^{ab}	± 0.60 ^a
ADG in body length (cm/day/lamb)	0.097 ± 0.004 ^b	0.1008 ± 0.006 ^{ab}	0.11 ± 0.007 ^a
Withers height (cm)	8.90 ± 0.203 ^b	9.40 ± 0.26 ^{ab}	9.57 ± 0.25 ^a
ADG in height (cm/day/lamb)	0.099 ± 0.002 ^b	0.104 ± 0.003 ^{ab}	0.106 ± 0.003 ^a
Chest girth (cm)	9.15 ± 0.28 ^b	10.15 ± 0.31 ^{ab}	10.30 ± 0.127 ^a
ADG in chest girth (cm/day/lamb)	0.102 ± 0.009 ^b	0.113 ± 0.004 ^{ab}	0.114 ± 0.001 ^a
Total greasy fleece yield (kg)	0.924 ± 0.003 ^b	1.335 ± 0.005 ^{ab}	1.349 ± 0.002 ^a
Average greasy fleece yield (kg/lamb)	0.231 ± 0.0095 ^b	0.333 ± 0.039 ^{ab}	0.337 ± 0.040 ^a

Note: Different small letter after mean values indicate significant difference among rearing systems (Tukey's HSD, $P < 0.05$), ADG=Average Daily Gain

The average total body weight gain in 90 days was higher in stallfed system (3.45 + 0.81 kg/lamb) than semistall system (2.6 + 0.117 kg/lamb) and grazing system (2.025 + 0.265/lamb). The average daily gain in weight per lamb was significantly higher ($P < 0.01$) in stallfed (38.33 + 8.99 g) than the semistallfed (28.89 + 1.30 g) and grazing system (22.5 + 2.95 g).. The results of this study were in

agreement with findings of Johri and Talpatra (1997), Saini et al. (1986) and Jagtap and Naikare (1989).

The average total body length gain during experimental period was maximum in stallfed lambs ($9.92 + 0.601$ cm) followed by semistallfed lambs ($9.07 + 0.566$ cm) and grazing lambs ($8.77 + 0.32$ cm) [Table 1.]. The average daily gain in body length per lamb was significantly higher ($P < 0.01$) in stallfed system ($0.11 + 0.007$ cm) than the semistallfed ($0.1008 + 0.006$ cm) and grazing system ($0.097 + 0.004$ cm) (Table 1). The average body length gain of lambs in present study is similar to the growth performance of sheep as earlier findings of Dass (2007).

The average body height was found maximum in stallfed system ($9.57 + 0.25$ cm) followed by semistallfed ($9.4 + 0.26$ cm) and grazing ($8.9 + 0.203$ cm). Present study revealed that the average daily gain in body height per lambs were significantly higher ($P < 0.01$) in stallfed lambs ($0.106 + 0.003$ cm) than semistallfed ($0.104 + 0.003$ cm) and grazing ($0.099 + 0.002$ cm). The findings of Mali et al. (1985) revealed that Deccani sheep showed similar types of body measurements during the growth period of sheep.

The present study showed that the average total gain in chest girth of $9.15 + 0.28$ cm, $10.15 + 0.31$ cm and $10.30 + 0.127$ cm were observed in grazing, semistallfed and stallfed systems, respectively. The average daily gain in chest girth per lamb was significantly higher ($P < 0.01$) in stallfed ($0.114 + 0.001$ cm) than semistallfed ($0.113 + 0.004$) and grazing ($0.102 + 0.003$ cm). The relationship of body measurements like body length, height, chest girth of Deccani sheep was also observed by Mali et al. (1985).

The average total greasy fleece yield during experimental period (lambs attained slaughter age) was higher in stallfed system ($1.349 + 0.002$ kg) than semistallfed ($1.335 + 0.005$ kg) and grazing ($0.924 + 0.003$ kg) system. The average greasy fleece yield per lamb was significantly higher ($P < 0.01$) in stallfed lambs ($0.337 + 0.040$ kg) than semistallfed ($0.333 + 0.039$ kg) and grazing system ($0.231 + 0.0095$ kg). This effect of body weight and wool production in Deccani and crossbred sheep were observed by Thorat et al. (1990). Therefore the greasy fleece production was more in Deccani lambs reared in stallfed system.

The cost per unit live weight gain in different management systems are tabulated in Table.2. It is observed that the total cost of feed per lamb per day was Rs. 1.43 in grazing, Rs. 2.63 in semistallfed and Rs. 4.11 in stallfed systems. The data pertinently showed that feed cost per kg live weight gain was Rs. 0.70, 1.00 and 1.19 per lamb per day in grazing, semistallfed and stallfed systems, respectively. The results revealed that stallfeeding is more economical than the grazing and semistall feeding considering feed cost/kg live gain in weight. In the present findings, the feed cost/kg live weight gain was more economical than the other two systems. Similar results obtained by Singh et al. (1986) also proved that sheep reared under stallfed was more beneficial considering feed cost/live weight gain during the growing period of Chokla and Merino sheep.

Table 2: Cost per unit live weight gain in different management systems

Particulars	Grazing	Semi-stallfed	Stallfed
	90 days	90 days	90 days
Total Experimental Period	90 days	90 days	90 days
Initial body weight (kg)	15.00	14.92	14.95
Final body weight(kg)	17.02	17.52	18.40
Total weight gain (kg)	2.02	2.60	3.45
Average daily gain in weight (g)	22.50	28.89	38.33
Feed intake per lamb/day			
1)Roughage (kg)			
i)Green maize (kg)	-	0.321	0.767
ii)Jowar kadbi (kg)	-	0.261	0.575
2)Conc. Mixture(kg)	0.150	0.150	0.150
Cost of roughage (Rs.)			
i)Green maize* (Rs.)	-	0.160	0.383
ii)Jowar kadbi* (Rs.)	-	1.044	2.30
Cost of conc.	1.43	1.43	1.43
** Mixture(Rs.)			
Total feed cost per lamb/day (Rs.)	1.43	2.63	4.11
Cost/kg gain /lamb /day(Rs.)	0.70	1.00	1.19

* Green maize, Rs.50/- per qtl. * Jowar kadbi, Rs.400/- per qtl., **Conc. Mixture, Rs.958/- per qtl.

CONCLUSIONS

The more intake of dry matter in stallfed lambs than the grazing and semistallfed group resulted in

the superior growth performance with respect to gain in body weight and body measurements in stalled group over the other systems. Present study suggested that the sustainable lamb production could be promoted in the agro climatic conditions of Konkan region by supplementation of concentrate mixture and nutritive feeds to the lambs under the stalled management system.

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