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A study on growth performance of local lambs in Hassan district of Karnataka

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Abstract

The growth performance of local lambs of Hassan region was assessed in this study. Twelve lambs (born during the period from May, 2017 to April, 2018) from each agro-climatic zones were selected and recorded for their body weight starting from their birth up to nine months at fortnightly intervals. The data was categorised for 0-3, 3-6 and 6-9 months lambs and along with the birth weight, Average Daily Gain was analysed statistically to assess their growth rate. It was observed that the average ADG (g) recorded between 0-3, 3-6 and 6-9 months of age was 68.28 ± 1.48 , 52.34 ± 1.68 and 38.29 ± 1.58 , respectively and the average weight at birth, three months, six months and nine months were 2.51 ± 0.06 , 8.65 ± 0.17 , 13.3 ± 0.34 and 16.79 ± 0.50 kg respectively. The study revealed that the birth weight, ADG and growth rate varied significantly in Central Dry Zone in comparison with other two zones. Larger flock size, poor vegetation and early let out of ewes, less attention to lambs with respect to suckling and care by the mother were the reasons attributed to the reduced growth rate of lambs.

Keywords: ADG, birth weight, growth, Hassan, lambs

Introduction

The overall productivity of the sheep flock is determined by meat production in sheep and growth is an important trait for meat production in small ruminants (Gobena and Tona, 2017)^[5]. The various stages of growth particularly the early stage in lamb is highly affected by the breed, ewe's milk yield, availability of adequate quantity and quality of feed and the rearing environment or housing, the parity, weight of the ewe at breeding, type of birth, sex of the lamb and season of birth (Thiruvankadan *et al.*, 2008; Balasubramanyam and Kumarasamy, 2011)^[10, 11]. The different production systems significantly influence the production performance like overall body weight and Average Daily Gain in sheep (Sinha and Deoghare, 1996; Das *et al.*, 2008)^[9, 3].

Materials and Methods

The present study was undertaken to assess the growth performance of local lambs in the field flocks at Hassan district of Karnataka state. The study was carried out in three different agro climatic zones *viz*: Central Dry Zone (CDZ), Southern Dry Zone (SDZ) and Southern Transition Zone (STZ) of this region. Three categories of lambs *i.e.*, 0-3, 3-6 and 6-9 months old formed the study group from each zone and 12 lambs were selected randomly (six ewe lambs and six ram lambs) from each category for all the three zones *i.e.* 36 lambs from one zone and a total of 108 lambs were used for the study. The lambs born during the period from May, 2017 to April, 2018 were recorded for their body weight starting from their birth up to nine months at fortnightly intervals using 50 kg digital weighing balance and a specially designed weighing bag. The fortnightly body weight was used to arrive at Average Daily Gain (ADG) both during pre-weaning period and the post-weaning period.

Results and Discussion

a. ADG at various stages of growth

The Average Daily Gain/Absolute Growth rate recorded in lambs across the three Agro-climatic zones in the study area is presented in Table 1. It was observed that the average ADG recorded between 0-3, 3-6 and 6-9 months of age was 68.28 ± 1.48 , 52.34 ± 1.68 and 38.29 ± 1.58 g, respectively (Table 2 and Graph. 1 and 2). The corresponding values for male were 69.08 ± 2.22 , 53.69 ± 2.52 and 37.43 ± 2.27 g whereas, the same for female were 67.44 ± 2.00 , 50.92 ± 2.23 and 39.19 ± 2.25 g, respectively. There was non-significant difference observed between the male and female lambs with respect to ADG concurrent to this, Mandal *et al.*

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(2003) [6] reported non-significant influence of sex on growth rate in both post-weaning and pre-weaning stages in Muzaffaranagari sheep. On the contrary, Getie *et al.* (2017) [4]

opined that male sheep generally grow faster and were heavier with superior body conformation than female sheep. This feature was also reaffirmed by Markos *et al.* (2004) [7].

Table 1: Average Daily Gain (g) of lambs recorded across the Zones (Mean ± SE)

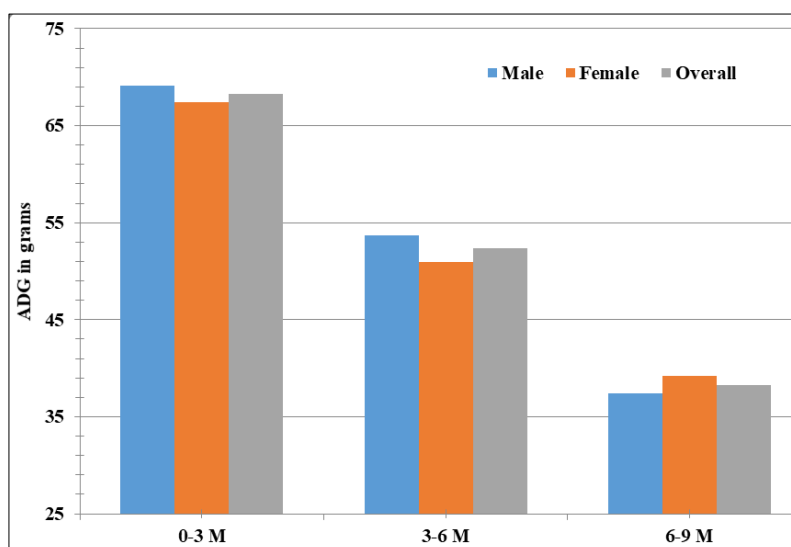
Age	Zones	Male	Female	Overall
0-3 M	CDZ	58.56 ± 3.39 ^b	55.72 ± 1.47 ^b	57.25 ± 1.77 ^b
	SDZ	72.78 ± 1.43 ^a	71.70 ± 1.17 ^a	72.24 ± 0.84 ^a
	STZ	77.04 ± 1.29 ^a	74.20 ± 0.77 ^a	75.62 ± 0.77 ^a
3-6 M	CDZ	40.37 ± 2.28 ^b	39.09 ± 2.27 ^b	39.78 ± 1.44 ^b
	SDZ	62.88 ± 1.98 ^a	58.74 ± 1.45 ^a	60.81 ± 1.22 ^a
	STZ	58.52 ± 1.45 ^a	53.62 ± 2.22 ^a	56.07 ± 1.35 ^a
6-9 M	CDZ	25.24 ± 1.23 ^b	27.50 ± 2.81 ^b	26.28 ± 1.32 ^b
	SDZ	44.14 ± 2.41 ^a	44.75 ± 1.45 ^a	44.45 ± 1.26 ^a
	STZ	43.81 ± 1.28 ^a	44.39 ± 2.65 ^a	44.10 ± 1.29 ^a

Note: Means between the zones, bearing different superscripts are statistically significant at $p < 0.05$

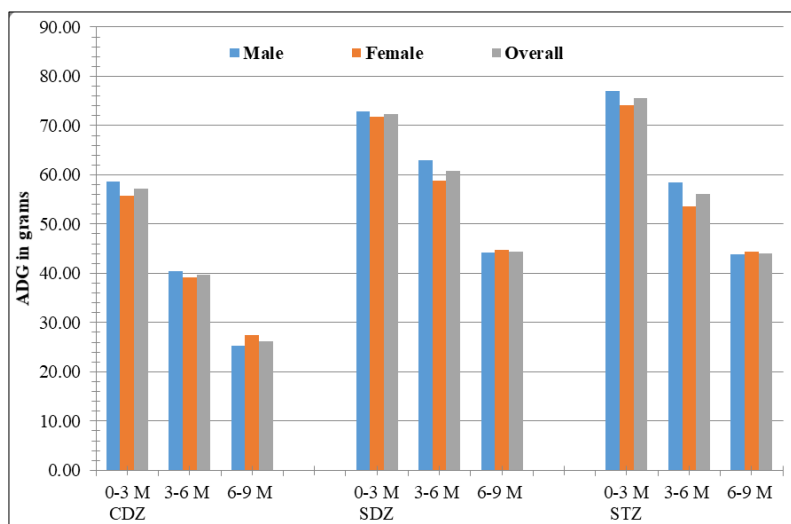
Table 2: Mean ± SE values of Average Daily Gain (g) of lambs (Pooled)

Age	0-3 M	3-6 M	6-9 M
Male	69.08 ± 2.22 ^{NS}	53.69 ± 2.52 ^{NS}	37.43 ± 2.27 ^{NS}
Female	67.44 ± 2.00 ^{NS}	50.92 ± 2.23 ^{NS}	39.19 ± 2.25 ^{NS}
Overall	68.28 ± 1.48	52.34 ± 1.68	38.29 ± 1.58

Note: NS – Non Significant (between rows)



Graph 1: Overall ADG (g) in Lambs recorded across the Zones



Graph 2: ADG in Lambs recorded in different zones

The zone wise ADG was analysed and found to be 57.25 ± 1.77 , 72.24 ± 0.84 g and 75.62 ± 0.77 g in CDZ, SDZ and STZ, respectively for 0-3 months of age. While for 3-6 months of age, the ADG was recorded as 39.78 ± 1.44 , 60.81 ± 1.22 and 56.07 ± 1.35 g in CDZ, SDZ and STZ respectively. The ADG recorded for 6-9 months of age across CDZ, SDZ and STZ was 26.28 ± 1.32 , 44.45 ± 1.26 and 44.10 ± 1.29 g, respectively. For all the three age groups, the statistical difference between SDZ and STZ were non-significant whereas, the difference between CDZ and other two zones was significant ($p < 0.05$). Balasubramanyam and Kumarasamy, (2011) [1] also observed that ADG varied significantly for the post weaning period and also between the seasons.

The average daily gain recorded between 0-3, 3-6 and 6-9 months age were significantly ($p < 0.05$) different between CDZ and other two zones. The variation recorded could be attributed to the type of nutritional input, the animal received in this zone. CDZ being totally arid and dry with no facilities of irrigation, the kind of vegetation was sparse and scanty all through the year in comparison to the same in other two zones which were better in terms of vegetation and nutritional inputs. Moreover, the type of vegetation and topography of CDZ compel the sheep farmers to go on long distances in search of feed and water *i.e.*, sheep in this zone were grazed over long distances with low nutritive value forages owing to its agro-climatic features.

The ADG recorded especially during 0-3 months was comparatively low in CDZ since, the average flock size was more, the care received by the young ones was less *i.e.*, there was inverse relation between the neonatal care and the flock size.

b. Birth weight of lambs

The average weight at birth, three months, six months and nine months were 2.51 ± 0.06 , 8.65 ± 0.17 , 13.3 ± 0.34 and

16.79 ± 0.50 kg, respectively (Table 3 and 4).

Table 3: Mean \pm SE values of Body weight (kg) of Lambs recorded across the zones at different stages of growth

Age	Zones	Male	Female	Overall
Birth	CDZ	2.81 ± 0.09^b	2.57 ± 0.13^b	2.70 ± 0.07^b
	SDZ	2.45 ± 0.07^a	2.35 ± 0.09^a	2.40 ± 0.05^a
	STZ	2.45 ± 0.06^a	2.40 ± 0.13^a	2.42 ± 0.06^a
3 M	CDZ	8.08 ± 0.24^b	7.59 ± 0.18^b	7.85 ± 0.15^b
	SDZ	9.00 ± 0.17^a	8.80 ± 0.10^a	8.90 ± 0.09^a
	STZ	9.38 ± 0.14^a	9.08 ± 0.16^a	9.23 ± 0.10^a
6 M	CDZ	11.71 ± 0.23^b	11.11 ± 0.26^b	11.43 ± 0.17^b
	SDZ	14.66 ± 0.15^a	14.09 ± 0.10^a	14.37 ± 0.11^a
	STZ	14.65 ± 0.12^a	13.90 ± 0.23^a	14.28 ± 0.15^a
9 M	CDZ	13.99 ± 0.23^b	13.58 ± 0.08^b	13.80 ± 0.13^b
	SDZ	18.63 ± 0.22^a	18.11 ± 0.06^a	18.37 ± 0.12^a
	STZ	18.59 ± 0.15^a	17.90 ± 0.24^a	18.24 ± 0.16^a

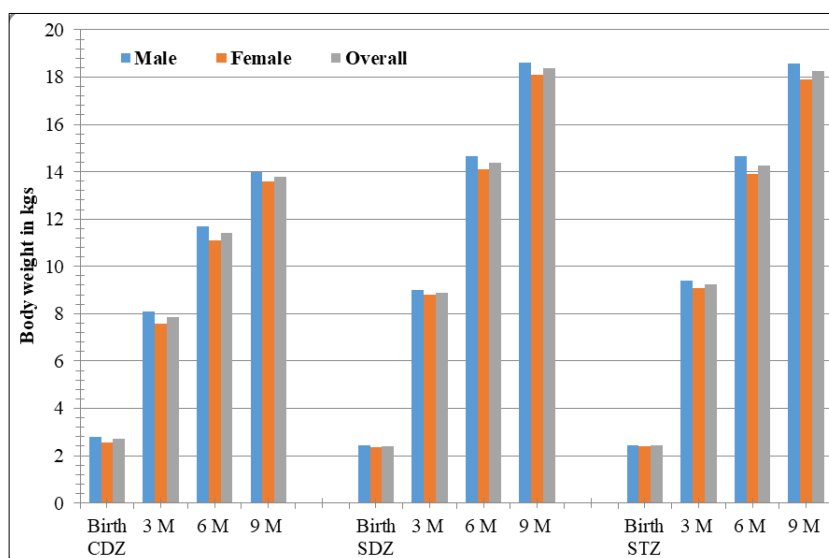
Note: Means between the zones, bearing different superscripts are statistically significant at $p < 0.05$

Table 4: Pooled Bodyweight (kg) of lambs at different stages of growth

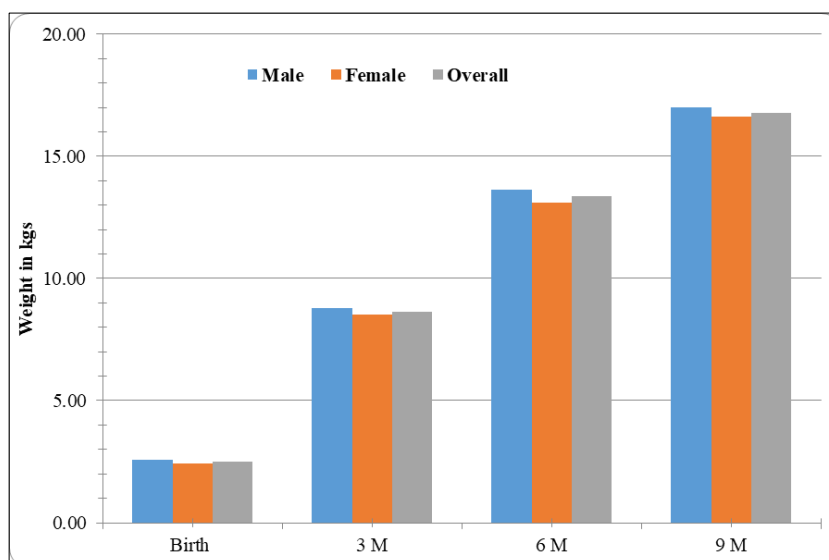
	Birth	3 M	6 M	9 M
Male	2.51 ± 0.05^{NS}	8.79 ± 0.16^{NS}	13.62 ± 0.32^{NS}	16.99 ± 0.49^{NS}
Female	2.44 ± 0.07^{NS}	8.51 ± 0.17^{NS}	13.09 ± 0.34^{NS}	16.61 ± 0.49^{NS}
Overall	2.51 ± 0.06	8.65 ± 0.17	13.37 ± 0.34	16.79 ± 0.50

Note: NS – Non Significant (between columns)

The same were depicted graphically in Graph 3 and 4. The female and male weights at these stages of growth were statistically non-significant ($p > 0.05$). This was supported by Belete *et al.* (2014) [2] who, opined that birth weight and weaning weight were not affected by the season, sex, birth type and parity whereas, Patro *et al.* (2006) [8] reported that body weight at different ages differed significantly between the sexes.



Graph 3: Body weight of Lambs recorded at different age group across the zones



Graph 4: Overall Body weight of Lambs recorded at different age group

The zone wise comparison of body weight of lambs revealed that the birth weight in CDZ, SDZ and STZ were 2.70 ± 0.07 , 2.40 ± 0.05 and 2.42 ± 0.06 kg, respectively. The same values at 3, 6 and 9 months of age were 7.85 ± 0.15 , 8.90 ± 0.09 and 9.23 ± 0.10 ; 11.43 ± 0.17 , 14.37 ± 0.11 and 14.28 ± 0.15 ; and 13.80 ± 0.13 , 18.37 ± 0.12 and 18.24 ± 0.16 kg, respectively in CDZ, SDZ and STZ.

The overall body weights, the body weight of males and females across the zones followed the similar statistical trend where in the values recorded for CDZ were significantly different ($p < 0.05$) in comparison to the values in SDZ and STZ while, non-significant difference was observed between SDZ and STZ with respect to body weight at various stages of growth.

The average birth weight of lambs were recorded across the zones were though comparable, the post-weaning and pre-weaning growth rate differed significantly in CDZ. This phenomenon was suggestive of the fact that pre-natal care of ewes was uniform across all zones whereas, post-natal care of both ewes as well as lambs differed. As it was evident that the ewes were sent out for grazing early in their post-lambing phase led to deprived nutrition to the lambs which consequently resulted in lower growth rate in lambs. Various other factors including the breed, ewe's milk yield, quantity and quality of feed available, parity *etc.*, were also considered as they influenced the growth rate and birth weight of lambs (Gobena and Tona, 2017; Thiruvankadan *et al.*, 2008) ^[5, 10].

Conclusion

The performance of sheep across different agro-climatic regions was studied in terms of absolute growth rate/ADG to assess the status of performance where in it was found that the overall ADG was satisfactory. The ADG and growth rate varied significantly in Central Dry Zone in comparison with other two zones. The comparative birth weight was even better but owing to larger flock size, poor vegetation and early let out of ewes, the lambs received less attention with respect to suckling and care by the mother, consequently resulting in reduced growth rate. The productive performance of sheep has got ample scope for improvisation as the ADG observed was too low especially in the Central Dry Zone for which managerial intervention in terms of educating the farmers regarding post-natal care and management of lambs by better feeding and restricting the ewes along with the lambs initially to attain better milk feeding shall be advocated.

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