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Morphometric studies of the different body parameters in Kenguri sheep

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Abstract

The present work was carried out to predict body weight from various body measurements in Kenguri sheep. Total of 150 animals with different age groups (0 - 6 months, 6 - 12 months and more than 12 months) Male and Female were taken for the present study in Veterinary college Bidar, KVAFSU, Karnataka and nearby villages of Bidar District. The measurements taken were body weight (BW), found to be significant at 6-12 month (Male 27.57 ± 0.75 kg and in female 20.05 ± 0.78 kg) and 12 and above (Male 46.20 ± 0.46 kg and female 32.04 ± 0.55 kg), body length (BL) was significant at 12 and above (male 22.21 ± 0.30 cm and female 20.91 ± 0.13 cm), heart girth (HG) was significant at 6-12 month (male 31.71 ± 0.80 cm and female 28.11 ± 1.90 cm), paunch girth (PG) found significant at the age 6-12 months (male 33.29 ± 0.60 cm and female 29.56 ± 1.80 cm) and above 12 months (male 36.44 ± 0.37 cm and female 35.24 ± 0.31 cm) and height at withers (HW) found significant at age 6-12 months (male 31.43 ± 0.29 cm and female 26.78 ± 1.23 cm) and above 12 months (male 32.52 ± 0.21 cm and female 30.05 ± 0.21 cm).

Keywords: Morphometry, Kenguri, body measurements

Introduction

India is a rich source of diverse ovine population with 74.26 million and about 13.8% of the total livestock population is contributed by sheep and it contributes 8% towards national economy by meat, processed products and their byproducts. Karnataka has 7 million sheep, Tumkur district has highest population of sheep with 10.68 lakh while Udipi district has the lowest number of sheep. In India, sheep are seen mainly in arid and semiarid agro-climatic zones. Maximum sheep population is seen in Andhra Pradesh, Karnataka and Tamil Nadu. There are 60 breeds of sheep, lesser known and some wild species and 42 recognized breeds of sheep in our country. A few breeds also exist in higher altitudes like Jammu and Kashmir and produce fine carpet wool of apparel quality. In general sheep rearing is very less in the areas of high rainfall, deep forest, water logging and Malnad area. The breeding of sheep is the backbone of the small and marginal farmers' economies. The state has sizable capacity for shared resources and pastures and pastureland is widespread. Kenguri breed is found in the district of Koppal, Raichur and the neighbouring district of Bagalkot and the district of Gulbarga. In both India and Karnataka, the majority of sheep breeds show low production and low growth. The sheep are large in size, body coat is dark brown or coconut coloured. In most cases, there is a white spot on the forehead and sometimes on legs and other body parts also. Some of the Kenguri sheep have black belly and are known as "JODKA". Ears are medium long and drooping. Males are usually horned and females polled. About 85% males and 6% females were observed as horned. Average horn length was 33.6 ± 0.97 cm in males and 10.2 ± 0.52 cm in females. Tail was short and thin with an average length of 10.1 ± 0.08 cm. The present study is under taken on the Kenguri breed of sheep record the different body parameters.

Materials and Methods

The body measurements of individual animals of different sexes (Male and Female) and age groups (0-6 months, 6-12 months and more than 12 months) were taken using a standard metallic and nylon tape. The live weight of the animal was taken using electronic Salter spring balance of 150 kg. In this study, the following body measurements were taken into consideration i.e. Live body weight, Body length, Heart girth, Paunch girth, Height at withers. The data for the present study was obtained in Kenguri sheep farm in Veterinary College Bidar

Karnataka state and nearby villages of Bidar district. The data were recorded on total of 150 animals and were divided in different age groups of 0 - 6 months, 6 -12 months and more than 12 months and Male and Female. The basic instruments used for the present study were measuring tape, measuring

scale and weighing machine. All body measurements were recorded in centimeters and live body weight was recorded in kilograms. The different body measurements studied along with their definition is given in the following table.

The different body measurements studied along with their definition is given in the following table

SL. No.	Body measurements	Definition
1	Live body weight	Body weight of individual animals were recorded in kilograms by using a digital weighing machine
2	Body Length	Distance from the point of shoulder to the pin bone in centimeters
3	Heart girth	Circumference of the chest just behind the point of elbow centimeters measured.
4	Paunch girth	Circumference of the abdomen just before the hind limbs in centimeters.
5	Height at withers	Vertical distance from ground to th highest point of wither in centimeters.
6	Body condition score	Body condition score was assessed by visual examination using a five-point scale



Plate 1: Measurement of body weight in Kenguri sheep



Plate 4: Measurement in paunch girth in Kenguri sheep



Plate 2: Measurement of body length in Kenguri sheep

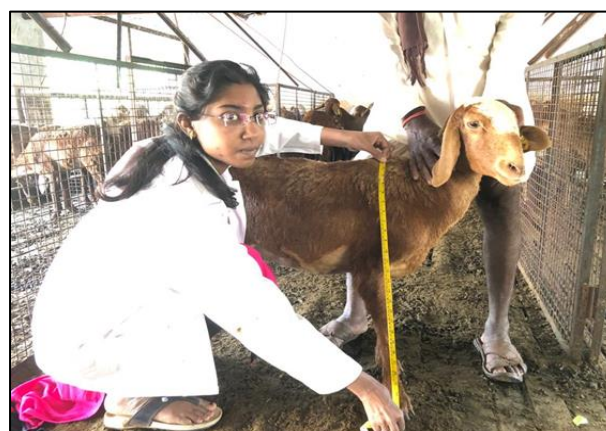


Plate 5: Measurement of height at withers in Kenguri sheep



Plate 3: Measurement of heart girth in Kenguri sheep

Results and Discussion

The present study was done for the measurement of body weight and body measurements of Kenguri sheep. Morphological data of Kenguri sheep was recorded and subjected to statistical analysis with the following results.

Body measurements of Kenguri sheep

Body Weight

The mean of body weight of males and females Kenguri sheep of different age groups viz 0 to 6 months, 6 to 12 months and above 12 months are presented in Table 1. In 0 to 6 months of age groups, the mean body weight was calculated as 12.27 ± 1.09 kg in males and 9.40 ± 0.96 kg in females respectively whereas, the mean body weight in 6 to 12 months of age groups was 27.57 ± 0.75 kg in males and 20.05 ± 0.78 kg

in females. In above 12 years of age group, the mean body weight in males and females appraised as 46.20±0.46 kg and 32.04±0.55 kg respectively. The present research revealed that the mean body weight of males was higher than the females in all age groups. The 0 to 6 months age groups were statistically significant ($p < 0.05$). However, during 6 to 12 months and above 12 months age groups were statistically non-significant ($p > 0.05$) at 5% difference level. Present results are in agreement with Singh *et al.* (1984) [17], Prakasam *et al.*, 1987 [11], Misra and Koratkar, 1994 [9], Sahana *et al.* (2001) [15], Poonia *et al.* (2004) [10], Appannavar *et al.* (2010) [2], Dayanand *et al.*, (2013) [6], Jain Anand *et al.* (2021) [6], Tekade Sachin *et al.* (2019) [18] and Arora *et al.* (2007) [7] who reported that Sex of lambs was to influence body weight lambs during their growth.

Table 1: Average body weight in different age groups

Sl. no	Age group	Male	Female	P value
1	0-6 Months	12.27±1.09	9.40±0.96	0.064
2	6-12months	27.57±0.75	20.05±0.78	0.00
3	Above 12 Months	46.20±0.46	32.04±0.55	0.00
Non-significant ($p > 0.05$) **, significant ($p < 0.05$) *5% difference				

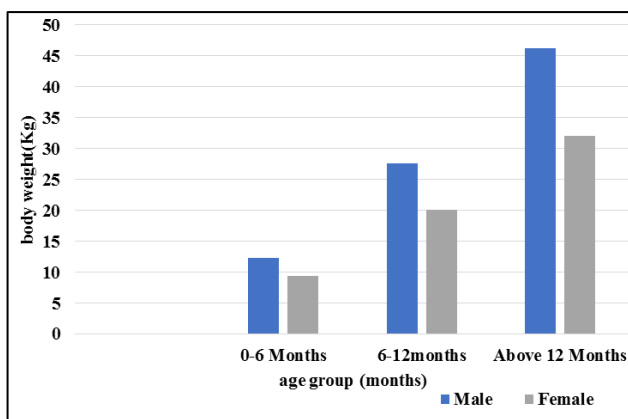


Fig 1: Average body weight in different age groups

Body length (cm)

The mean of body length of males and females Kenguri sheep at 0 to 6 months, 6 to 12 months and above 12 months of age group were depicted in Table 2. The mean body length at 0 to 6 months of age groups was calculated as 15.09±.41 cm in males and 15.00±0.60 cm in females respectively. Correspondingly, the mean body length of males and females during 6 to 12 months of age groups was 21.00±0.95 cm and 19.78±0.95 cm. In above 12 years of age group, the mean body length in males and females appraised as 22.21±0.30 cm and 20.91±0.13 cm respectively. The present study showed that the mean body length of males was higher than the females in different age groups. The 0 to 6 months and 6-to-12-month age groups were statistically non-significant ($p > 0.05$). However, above 12 months age groups were statistically significant ($p < 0.05$) at 5% difference level. Similar results were found with Bhat, 1988, Misra and Koratkar, (1994) [9], Rao and Patro (2004) [13] and Dixit *et al.* (2005) [7] who observed that body length was higher in male group of different ages. Whereas this result is in contrary to Sahana *et al.* (2001) [15] who reported that the average body length (cm) of Garole sheep breed of India at 3 month, 6 month, 12 month, 18 month, 24 month and more than 24 month for male is 30.00±2.12, 40.81±0.95, 45.78±0.70, 50.00±2.77, 50.00±2.77 and 58.00±0.0 respectively and for

female is 36.30±1.98, 42.70±1.09, 47.62±0.91, 45.00±0.82, 51.50±1.06 and 60.64±0.93 variation within certain measurements suggests absence of selection, or the parts respond more to the environment than others (Salako, A. E *et al.* 2006) [16].

Table 2: Average body length

Sl. no	Age group	Male	Female	P value
1	0-6 MOnths	15.09±.415	15.00±0.60	0.902
2	6-12months	21.00±0.951	19.78±0.95	0.388
3	Above 12 Months	22.21±0.300	20.91±0.13	0.000
Non-significant ($p > 0.05$) **, significant ($p < 0.05$) *5% difference				

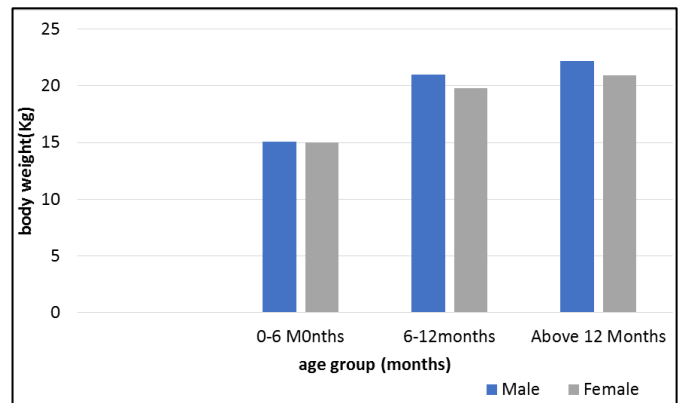


Fig 2: Average body length (cm)

Chest girth (cm) or heart girth

The mean of chest girth of male and female Kenguri sheep aged 0 to 6 months, 6 to 12 months and above 12 months are presented in Table 3. In 0 to 6 months of age groups, the mean chest girth was calculated as 21.27±0.63 cm in males and 21.55±0.87 cm in females respectively whereas, the mean chest girth in 6 to 12 months of age groups was 31.71±0.80 cm in males and 28.11±1.90 cm in females. In above 12 years of age group, the mean chest girth in males and females appraised as 33.49±0.35 cm and 32.78±0.21 cm respectively. The calculation revealed that the mean chest girth of males was higher than the females in different age groups. The 0 to 6 months, 6 to 12 month and above 12 months age groups were statistically nonsignificant ($p > 0.05$) at 5% difference level. These results are in agreement with Dixit *et al.* (2005) [7], Arora *et al.* (2007) [7], Ahmad *et al.* (2009) [1], Chandran *et al.* (2009) [5], Devendran *et al.* (2009) [14] and Yadav *et al.* (2011) [19] who observed that chest girth of males was higher than the females. Whereas Mandal *et al.* (2000) [8] studied on Muzaffarnagari sheep breed of India found a contrary result where he observed that heart girth of male and female 0 -7 days, 15-30 days, 3 months, 6 months, 12 months and Adult was (cms) 36.3±0.88 and 37.3±0.63, 43.0±0.98 and 41.3±0.80, 58.8±1.05 and 58.9±2.70, 66.4±0.82 and 66.2±0.64, 70.8±3.71 and 71.4±1.99, 75.2±1.09 and 82.5±0.35 respectively this might be due to heart girth measurements are usually affected by gut fill (Salako, A. E *et al.* 2006) [16].

Table 3: Average chest girth

Sl/no	Age group	Male	Female	P value
1	0-6 MONTHS	21.27±0.63	21.55±0.87	0.804
2	6-12MONTHS	31.71±0.80	28.11±1.90	0.137
3	ABOVE 12 MONTHS	33.49±0.35	32.78±0.21	0.089
Non-significant ($p > 0.05$) **, significant ($p < 0.05$) * 5% difference				

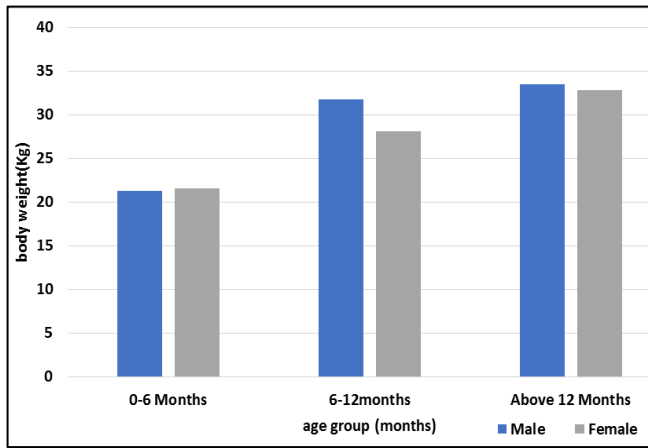


Fig 3: Average chest girth

Paunch Girth

The mean of paunch girth of male and female Kenguri sheep aged 0 to 6 months, 6 to 12 months and above 12 months are presented in Table 4. In 0 to 6 months of age groups, the mean paunch girth was calculated as 22.82±1.01 cm in males and 22.91±0.95 cm in females respectively whereas, the mean paunch girth in 6 to 12 months of age groups was 33.29±0.60 cm in males and 29.56±1.80 cm in females. In above 12 years of age group, the mean paunch girth in males and females appraised as 36.44±0.37 cm and 35.24±0.31 cm respectively. The presented calculation revealed that the mean paunch girth of males was higher than the females in different age groups. The study revealed that the mean paunch girth of males was higher than the females in different age groups. The 0 to 6 months, 6 to 12 month and above 12 months age groups were statistically nonsignificant ($p > 0.05$) at 5% difference level. The results are in agreement with Ravimurugan and Devendran (2009) [14], Yadav *et al.* (2011) [19]. Higher paunch girth is due to male has higher metabolic rate due to hormonal effect.

Table 4: Average paunch girth

Sl/no	Age group	Male	Female	P value
1	0-6 M0nths	22.82±1.01	22.91±0.95	0.949
2	6-12months	33.29±0.60	29.56±1.80	0.101
3	Above 12 Months	36.44±0.37	35.24±0.31	0.015

Non-significant ($p > 0.05$)*, significant ($p < 0.05$)* 5% difference

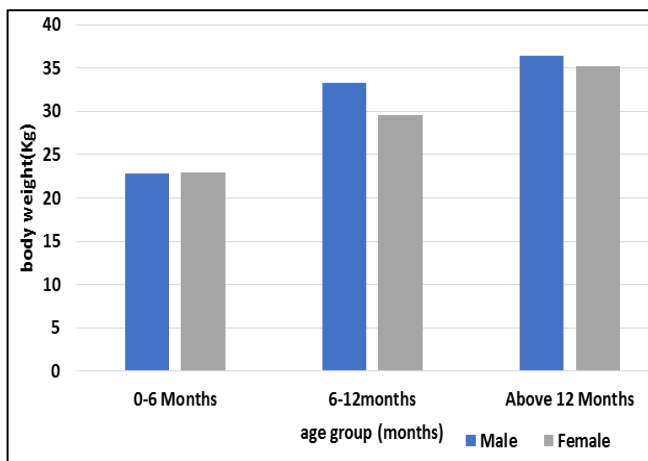


Fig 4: Average paunch girth

Height at withers

The mean of height at withers of male and female Kenguri

sheep aged 0 to 6 months, 6 to 12 months and above 12 months are presented in Table 5. In 0 to 6 months of age groups, the mean height at withers was calculated as 21.55±0.65 cm in males and 21.18±0.61 cm in females respectively whereas, the mean height at withers in 6 to 12 months of age groups was 31.43±0.29 cm in males and 26.78±1.23 cm in females. In above 12 years of age group, the mean height at withers in males and females appraised as 32.52±0.21 cm and 30.05±0.21 cm respectively. The present calculation revealed that the mean height at withers of males was higher than the females in different age groups. The mean height at withers of males was higher than the females in different age groups. The 0 to 6 months age groups were statistically non-significant ($p > 0.05$) however the 6 to 12 month and above 12 months age groups were statistically significant ($p < 0.05$) at 5% difference level. Present finding are in similar with Kushwaha *et al.* (1999), Dixit *et al.* (2005) [7], Arora *et al.* (2007) [7], Chandran *et al.* (2009) [5], Devendran *et al.* (2009) [14], Yadav *et al.* (2011) [19], Raja *et al.* (2012) [12] and Dayanand *et al.* (2013) [6] who observed that height at whither was high in male than in female. The result was in contrary with Salako, A. E *et al.* 2006 [16].

Table 5: Average height at withers

Sl/no	Age group	Male	Female	P value
1	0-6 M0nths	21.55±0.65	21.18±0.61	0.689
2	6-12months	31.43±0.29	26.78±1.23	0.006
3	Above 12 Months	32.52±0.21	30.05±0.21	0.000

Non-significant ($p > 0.05$)*, significant ($p < 0.05$)* 5% difference

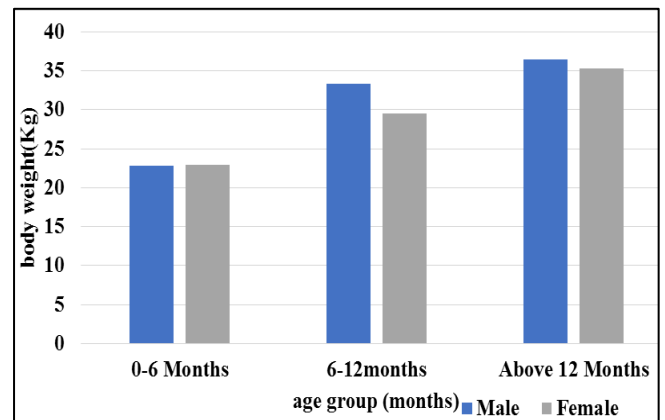


Fig 5: Average Height at withers

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