

## Studies on body weight, body measurements and scrotal morphology in local Pantja goats

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### ABSTRACT

The present study was carried out on Pantja bucks divided into four age groups *viz.* Group A (3-6 months), B(6-12 months), C (12-24 months) and D (> 24 months) respectively. The study revealed that the size of the testes varied in different age groups. The testicular length (TL) of group A, B, C and D was 3.77±0.09, 5.76±0.12, 6.47±0.16, 6.80±0.07 cm, respectively. The right testicular width (RTW) of groups A, B, C, D were 2.02±0.19, 3.58±0.11, 4.28±0.19, 4.46±0.09 cm, respectively and the left testicular width (LTW) was found relatively lower than the right of similar age group, but the difference was statistically non-significant. The mean testicular thickness was 1.63±0.18, 3.44±0.07, 3.91±0.07, 4.06±0.04 cm in group A, B, C and D. Further, the left testicular thickness (LTT) was relatively lower than the right of similar age group, but the difference was statistically non-significant. The scrotal volume in groups A, B, C and D were 23.40±3.19, 101.7±5.43, 162.86±17.55, 210.0±8.78 ml respectively. The testicular volume was highest in group D followed by group C, B and A. The increment in volume was lowest between group C and D and highest between group A and B. Scrotal surface temperature was found in the range of 93.8 - 96.2°F with an average of 95.2±0.30, 94.6±0.25, 94.6±0.22, 95.3±0.10°F in group A, B, C and D respectively while rectal temperature was found 102.8± 0.13, 101.6 ±0.41, 102.3± 0.32, 102.3± 0.5°F, respectively. The proportion of testicular weight to body weight was found as 0.002±0.0003, 0.005±0.0002, 0.005±0.0004 and 0.004±0.0002 in group A, B, C and D respectively. Scrotal neck width and scrotal neck thickness of group A, B, C and D was found as 2.31±0.08, 4.13±0.19, 4.31±0.46, 4.77±0.76 and 1.37±0.21, 1.52±0.15, 1.86±0.24, 2.28±0.08 cm, respectively. It can be concluded that the body weight has positive and significant (P<0.01) correlation with body measurements and testicular measurements (SC, TL, TW, TT, SV).

**Key words:** Body weight, Morphology, Pantja goats, Scrotal.

### INTRODUCTION

Goat biodiversity in India is characterized by high degree of endemism and variations in agro-climatic conditions of different regions has led to the development of various breeds/strains that are well adapted to specific set of environmental conditions. These breeds have generally been named after their place of origin and some based on their prominent characteristics. About 88% of farmers of Uttarakhand are small and marginal land holders who maintain 94% of goats for their livelihood support. Himalayan basin of Uttarakhand (U.S. Nagar and Nainital districts) inhabiting about 1.5 lakh goats (14% of state goat population) provide ample natural resources for sustenance of goat husbandry. Pantja is the medium sized, dual purpose local goat breed of Tarai region of Uttarakhand which contributes to about 21% of goat population. They are recognized for similarity with deer in

their morphological characteristics. They have brown red dorsal coat colour with black line and lighter ventral surface and there is presence of white streaks on either side of face. These characteristics are permanent in nature which passes from one generation to other. As these goats are found in Tarai, they are well adapted to climatic conditions of this region and resistant to many of the diseases of this region compared to other goats. Evaluation of breeding buck at early age has been challenging task to any goat owner as the achievement of high levels of fertility and prolificacy in goat relies not only upon the female members but also upon their male consorts (Alkass *et al.*, 1982). The body weight implies fair idea about future performance of kids; and in addition, it also helps goat growers in computing ration, medical doses, deciding proper breeding, market slaughter age and weight; as well as to evaluate the animal at particular age (Mule *et al.*, 2014).

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Scrotal circumference is an indirect measure of testicular size. Measurement of testicular size during the period of adolescence can provide fair indication to find out the age at which the males can be used for breeding purpose. Marked increase in testicular size indicates onset of active spermatogenesis (Bongso *et al.*, 1982). Bucks having naturally high libido can be reliably selected for breeding based on measurements of scrotal circumference, length or width of the testes. Scrotal circumference and semen characteristics were found to be different among different breeds and among individuals of the same breed (Langford *et al.*, 1998; Noran *et al.*, 1998).

The studies related to testicular measurements and semen evaluation have been done on other breeds of goat. Despite the importance of the above consideration, information on reproductive traits of Pantja bucks, in particular, is not available. Considering the aforementioned facts in mind the present study was undertaken on Pantja bucks to study the effect of body weight and body measurements on scrotal morphology.

#### MATERIALS AND METHODS

Data related to scrotal biometry were taken from field as well as Goat unit, Deptt. of LPM, College of Veterinary and Animal Sciences Pantnagar. For this study, five sexually mature Pantja bucks aged 8 months, 9 months, 12 months, 13 months and 2.5 years, having initial body weight 16 kg, 19 kg, 25 kg, 26 kg and 38 kg, respectively were available at the Goat unit and hence used in the study. The age of the bucks was determined from birth records. Selected bucks were reared under semi-intensive system and housed isolated from does and accommodated individually in shaded pens (10 sq. ft area) with concrete floors during the study period. All animals were clinically examined and confirmed to be free from any obvious abnormalities of the palpable reproductive organs viz., testis, prepuce, penile portion of penis, cauda epididymis and other abnormalities like cryptorchidism, orchitis, phimosis, paraphimosis.

These data were taken from the field in the nearby area of Pantnagar and also at the Goat unit, Deptt. of LPM, Pantnagar and thus a total of 26 records were generated for each of the body conformation and scrotal measurements and the bucks were classified according to age into 4 groups, as below:

- |    |         |              |        |
|----|---------|--------------|--------|
| 1. | Group A | 3-6 months   | n = 5  |
| 2. | Group B | 6-12 months  | n = 10 |
| 3. | Group C | 12-24 months | n = 7  |
| 4. | Group D | > 24 months  | n = 4  |

The body measurements included body weight, body length, chest girth, height at withers and paunch girth, whereas

the scrotal biometry included testicular length, thickness, width, weight, width and thickness of scrotum at neck area, scrotal skin thickness, scrotal surface temperature and testicular weight : body weight.

#### RESULTS AND DISCUSSION

The findings of present investigation on body morphology, scrotal morphology, libido and semen biology were carried out on Pantja bucks.

**i. Body weight and body measurements:** Mean body weight and body measurements of Pantja bucks at different age groups have been presented in Table 1.

**a. Body weight:** Body weight (BW) of group A, B, C and D was found  $8.9 \pm 0.60$ ,  $17.86 \pm 1.17$ ,  $27.57 \pm 1.88$ ,  $37.38 \pm 1.88$  kg, respectively. The mean BW of all the groups differed significantly ( $P < 0.05$ ). This scenario is, however, not surprising since the size and shape of the animal is expected to increase as the animal is growing with age. The present findings were in line with those of Rahman *et al.* (2008), Kabiraj *et al.* (2011) and Mittal and Ghosh (1985).

**b. Body conformation traits:** Body length (BL) of group A, B, C and D were observed as  $44.0 \pm 2.37$ ,  $53.67 \pm 1.80$ ,  $63.04 \pm 1.61$  and  $73.87 \pm 1.19$  cm, respectively. Height at withers (HAW) of group A, group B, group C and group D was  $47.72 \pm 1.8$ ,  $59.6 \pm 1.01$ ,  $68.87 \pm 1.63$  and  $78.9 \pm 1.14$  cm, respectively. Chest girth (CG) of group A, group B, group C and group D was found  $47.7 \pm 2.11$ ,  $59.69 \pm 1.24$ ,  $67.71 \pm 1.26$ ,  $81.42 \pm 1.06$  cm, respectively. Paunch girth (PG) of group A, group B, group C and group D was observed as  $50.98 \pm 0.83$ ,  $65.37 \pm 1.34$ ,  $71.49 \pm 0.88$  and  $84.35 \pm 0.78$  cm, respectively. The mean body length, height at withers, chest girth, Paunch girth of all the groups differed significantly ( $P < 0.05$ ). This might be due to the fact that traits related to body stature tend to increase with progressing age. It may also infer that above traits continued to increase up to 2.5 years.

Body length (BL) of groups A, B, C and D were observed as  $44.0 \pm 2.37$ ,  $53.67 \pm 1.80$ ,  $63.04 \pm 1.61$  and  $73.87 \pm 1.19$  cm, respectively, which in line with that reported by Khan *et al.* (2006). BL in adult male Indian Beetal goat was found to be 86 cm (Banerjee, G. C., 2005) which is higher than what is observed in the present study while BL of Pantja bucks was found higher than the reports of Paul *et al.* (2011) in Black Bengal bucks.

Height at withers (HAW) of groups A, B, C and D were obtained as  $47.72 \pm 1.8$ ,  $59.6 \pm 1.01$ ,  $68.87 \pm 1.63$  and  $78.9 \pm 1.14$  cm, respectively. The results of the present study are in agreement with that of Paul *et al.* (2011) who also observed significant difference in wither height with different age groups. Rahman *et al.* (2008) reported height at withers

**TABLE 1:** Body weight and different body measurements at varying age of Pantja bucks

Group	No. of animals	Age (m)	Body weight (kg)	Body length (cm)	Height at withers (cm)	Chest girth (cm)	Paunch girth (cm)
A	5	3-6	8.90 <sup>a</sup> ±0.60	44.00 <sup>a</sup> ±2.37	47.72 <sup>a</sup> ±1.80	47.70 <sup>a</sup> ±2.11	50.98 <sup>a</sup> ±0.83
B	10	6-12	17.86 <sup>b</sup> ±1.17	53.67 <sup>b</sup> ±1.80	59.60 <sup>b</sup> ±1.01	59.69 <sup>b</sup> ±1.24	65.37 <sup>b</sup> ±1.34
C	7	12-24	27.57 <sup>c</sup> ±1.88	63.04 <sup>c</sup> ±1.61	68.87 <sup>c</sup> ±1.63	67.71 <sup>c</sup> ±1.26	71.49 <sup>c</sup> ±0.88
D	4	>24	37.38 <sup>d</sup> ±1.88	73.87 <sup>d</sup> ±1.19	78.90 <sup>d</sup> ±1.14	81.42 <sup>d</sup> ±1.06	84.35 <sup>d</sup> ±0.78

Means with different superscripts (a, b, c, d) differed significantly within the column (P<0.05)

**TABLE 2:** Mean(±SE) of different scrotal measurements and Rectal temperature of bucks in different age groups

Group	Scrotal circumference (cm)	Scrotal volume (ml)	Neck width (cm)	Neck thickness (cm)	Scrotal surface temperature (°F)	Rectal temperature (°F)
A	11.57 <sup>a</sup> ±0.93	23.40 <sup>a</sup> ±3.19	2.31 <sup>a</sup> ±0.08	1.37 <sup>a</sup> ±0.21	95.2 <sup>A</sup> ±0.30	102.8 <sup>B</sup> ±0.13
B	19.31 <sup>b</sup> ±0.55	101.70 <sup>b</sup> ±5.43	4.13 <sup>b</sup> ±0.19	1.52 <sup>a</sup> ±0.15	94.6 <sup>A</sup> ±0.25	101.6 <sup>B</sup> ±0.41
C	22.26 <sup>c</sup> ±0.39	162.86 <sup>c</sup> ±17.55	4.31 <sup>b</sup> ±0.46	1.86 <sup>a</sup> ±0.24	94.6 <sup>A</sup> ±0.22	102.3 <sup>B</sup> ±0.32
D	23.27 <sup>c</sup> ±0.48	210.00 <sup>d</sup> ±8.78	4.77 <sup>b</sup> ±0.76	2.28 <sup>b</sup> ±0.08	95.3 <sup>A</sup> ±0.10	102.3 <sup>B</sup> ±0.50

of Black Bengal bucks of different age group viz., 6, 9, 12 and 15 months as 39.95±0.70, 43.73±0.55, 47.92±0.76, 51.21±0.93 cm which was lower than the results of present study.

Chest girth (CG) of groups A, B, C and D were found 47.7±2.11, 59.69±1.24, 68.87±1.63, 81.42±1.06 cm, respectively. The findings of the present study are not in agreement with that of Rahman *et al.* (2008) who reported CG of Black Bengal bucks at 3, 6, 9, 12 and 15 months of age as 35.67±0.40, 51.10±0.82, 54.26±0.64, 59.08±0.87, 63.25±1.07 cm, respectively. The variation in results might be due to breed difference. Although, they also reported that age had a significant effect (P<0.05) on CG which is in agreement with findings of present study.

The strong influence of age on live body weight and linear body measurements in all the traits measured is depicted by the consistent increase in all the measurements as the animals advanced in age.

**ii. Scrotal biometry:** The scrotal biometry of Pantja bucks in different age groups is presented in Table 2. The different parameters studied were scrotal circumference, testicular length (left, right and mean), testicular width (left, right and mean), testicular thickness (left, right and mean), testicular weight (left, right and mean), scrotal volume, thickness and width of scrotum at neck area, scrotal surface temperature.

**a. Testicular length:** In the present study testes of buck were found ovoid in shape. The testes represented two surfaces, medial and lateral; two borders free (ventral) and attached (dorsal) and two extremities, head extremity and tail extremity. The size of the testes varied in different age groups and right testicular length (RTL) of groups A, B, C and D

were 3.84±0.11, 5.79±0.09, 6.50±0.16, 6.84±0.09 cm, respectively. Maximum increase in testicular length was observed between the group A and B (3.84 Vs 5.79) whereas the difference in RTL between groups B and C was found 0.71 cm; C and D was nearly 0.34 cm. This indicates that TL increases with the advancement of age, however it slows down drastically after 1 year.

Left testicular length (LTL) of groups A, B, C and D were 3.70±0.10, 5.74±0.19, 6.45±0.18, 6.77±0.07 cm, respectively. Although the length of left and right testes differ numerically within the group but the difference was statistically non-significant (P>0.05) which is in agreement with Gogoi *et al.* (2005) and Bilaspuri and Singh (1992) in Malabari goats. Similar trend was observed in length of left testes as that of right, i.e., maximum increase in testicular length was observed between the group A and B (3.70 Vs 5.74) whereas the difference in LTL between groups B and C was 0.71 cm; C and D was nearly 0.32 cm. This may be due to increase growth rate up to 1 year of life of buck after which bucks have attained sexual maturity. The mean testicular length of groups A, B, C and D was 3.77±0.09, 5.76±0.12, 6.47±0.16, 6.81±0.08 cm, respectively. Testicular length measured in present study in group C and D was higher than the value recorded by Gogoi *et al.* (2005) in Beetal x Assam bucks and Giri *et al.* (1994) in Black Bengal and Ganjam bucks. This variation might be due to difference in breed, plane of nutrition and managerial practices.

This study indicated that length of testes (left, right, mean) increased with the advancement of age of animals which made a similar agreement with the findings of Gofur *et al.* (2007) and Islam (2001).

**b. Testicular thickness:** Right testicular thickness (RTT) of groups A, B, C and D were  $1.69 \pm 0.22$ ,  $3.51 \pm 0.13$ ,  $3.94 \pm 0.06$ ,  $4.11 \pm 0.04$  cm and left testicular thickness (LTT)  $1.56 \pm 0.15$ ,  $3.38 \pm 0.08$ ,  $3.88 \pm 0.08$ ,  $4.02 \pm 0.06$  cm, respectively. The mean testicular thickness was  $1.63 \pm 0.18$ ,  $3.44 \pm 0.07$ ,  $3.91 \pm 0.07$ ,  $4.06 \pm 0.04$  cm in group A, B, C and D. Testicular thickness observed similar trend of testicular length. LTT was relatively lower than the right of similar age group but difference was statistically non-significant ( $P > 0.05$ ). The results of the study were marginally higher than Gogoi *et al.* (2005) in Beetal x Assam bucks.

**c. Testicular width:** Right testicular width (RTW) of groups A, B, C, D were  $2.02 \pm 0.19$ ,  $3.58 \pm 0.11$ ,  $4.28 \pm 0.19$ ,  $4.46 \pm 0.09$  cm, respectively and Left testicular width (LTW) was  $1.95 \pm 0.15$ ,  $3.63 \pm 0.17$ ,  $4.20 \pm 0.16$ ,  $4.37 \pm 0.12$  cm, respectively. The mean testicular width was  $1.99 \pm 0.17$ ,  $3.60 \pm 0.13$ ,  $4.21 \pm 0.18$ ,  $4.42 \pm 0.11$  cm in group A, B, C and D respectively. LTW was relatively lower than the right of similar age group but difference was statistically non-significant ( $P > 0.05$ ) which was in agreement with Gogoi *et al.* (2005) and Bilaspuri and Singh (1992) in Malabari goats. The testicular width also increased with advancement of age. However, the increment in TW was lower between groups C and D.

**d. Testicular weight:** Weight of Right testes (RTWT) in groups A, B, C and D were  $9.14 \pm 2.07$ ,  $41.33 \pm 2.53$ ,  $66.95 \pm 6.96$ ,  $75.91 \pm 3.85$  g and left testes (LTWT) was  $8.02 \pm 1.38$ ,  $43.50 \pm 5.10$ ,  $63.78 \pm 5.68$ ,  $72.13 \pm 4.57$  g and average weight (TWT) was  $8.58 \pm 1.72$ ,  $42.42 \pm 3.57$ ,  $65.36 \pm 6.19$ ,  $74.02 \pm 4.21$  g, respectively. The weight of the testes varied in different age groups and even in between left and right testes of same age group in the present study. However, variation in the weight of testes, i.e., right and left in the same age group was non-significant ( $P > 0.05$ ) which is in agreement with findings of Oyeyemi *et al.* (2012). In the present study, the average TWT of the testes of age group D was significantly ( $P < 0.05$ ) higher than that of age group A but the average weight in age group D did not differ significantly ( $P > 0.05$ ) than that of age group C. Higher testes weight in age group D might be due to their higher body weight and size. This finding made a strong agreement with the results of Islam (2001). On the other hand, Raji *et al.* (2008) reported the average testicular weight at 1.0, 2.0, and 3.0 years of age were  $55.00 \pm 2.87$ ,  $77.28 \pm 1.88$  and  $103.01 \pm 2.23$  gm respectively in Red Sokoto goats, which was almost similar to the result of present study whereas the results were higher than that of Kabiraj *et al.* (2011) in Black Bengal bucks. This might be due to breed difference, agro-climatic condition, nutritional level, and other managerial procedure.

**e. Scrotal circumference:** Scrotal circumference (SC) of group A, B, C and D were  $11.57 \pm 0.93$ ,  $19.31 \pm 0.55$ ,  $22.26 \pm 0.39$ ,  $23.27 \pm 0.48$  cm, respectively. It was observed that with the advancement of age SC has increased. This is in agreement with Gogoi *et al.* (2005) who measured SC at different months of age in Beetal x Assam bucks. The difference in SC between the various age groups was highest between group A and B which marginally decreased between group B and C. However, in group D the circumference was increased marginally which indicate that growth of scrotum has reduced after 2 years. This finding is in agreement with Brito *et al.* (2002) who demonstrated that SC increases rapidly in young bulls, only gradually in mature bulls and can even decrease as bulls aged. It was observed that the scrotal circumference of age group D was significantly ( $P < 0.05$ ) higher than that of age group A and B this might be due to difference in age and body weight of bucks, dam's age at first breeding, pregnancy rate and days to rebreeding after kidding but there was no significant difference ( $P > 0.05$ ) with that of age group C. The mean values of SC recorded in group B and C were in concurrence with Gogoi *et al.* (2005) in Assam x Beetal bucks. The findings of present study on SC are higher than Shamsuddin *et al.* (2000) who reported mean scrotal circumference of Black Bengal buck at puberty to be 14.0 to 16.0 cm and Rahman *et al.* (2008) who reported the average scrotal circumference in Black Bengal bucks as  $10.35 \pm 0.39$ ,  $15.42 \pm 0.34$ ,  $18.05 \pm 0.24$ ,  $19.72 \pm 0.33$  and  $20.83 \pm 0.41$  cm at 3, 6, 9, 12 and 15 months, respectively and with Oyeyemi *et al.* (2012) who reported average SC of 17.14 cm in Sahel bucks between 30-54 months. The difference in results of SC may be due to breed difference, post-weaning feed level, weight and height of bucks and other managerial practices (Bourdon and Brinks, 1986). On the other hand, the findings of the present study are similar to that of the findings of Keith *et al.* (2009) and Mekasha *et al.* (2008).

**f. Scrotal volume:** Scrotal volume in groups A, B, C and D were  $23.40 \pm 3.19$ ,  $101.7 \pm 5.43$ ,  $162.86 \pm 17.55$ ,  $210.0 \pm 8.78$  ml, respectively. The testicular volume was highest in group D followed by group C, B and A. The increment in volume was lowest between group C and D and highest between group A and B. The higher increment in volume in group A and B might be due to growing phase of animal. During the growing phase, the increment in scrotal volume could be due to physiological changes and growth of testicular parenchyma, i.e., growth of testes in length, width and thickness. The lower increment in volume between group C and D might be due to stagnation of growth. This indicated that the bucks might have reached maximum testicular growth at 2 years of age. Results

of the present study are in agreement with that of Bilaspuri and Singh (1992) in Malabari and Beetal bucks. Gogoi *et al.* (2005) also noted that Beetal x Assam bucks reached maximum testicular growth at 19 months of age.

**g. Scrotal neck width and thickness:** Scrotal neck width and scrotal neck thickness of groups A, B, C and D were found as  $2.31 \pm 0.08$ ,  $4.13 \pm 0.19$ ,  $4.31 \pm 0.46$ ,  $4.77 \pm 0.76$  and  $1.37 \pm 0.21$ ,  $1.52 \pm 0.15$ ,  $1.86 \pm 0.24$ ,  $2.28 \pm 0.083$  cm, respectively. Neck width increased significantly in group B but no significant difference was observed in width of group B, C and D although values increased numerically. Different trend was observed for scrotal neck thickness in which the values increased numerically without significant difference in group A, B and C while significant difference was observed in group D.

**h. Scrotal surface temperature:** Scrotal surface temperature was found in the range of  $93.8 - 96.2^\circ \text{F}$  with an average of  $95.2 \pm 0.30$ ,  $94.6 \pm 0.25$ ,  $94.6 \pm 0.22$ ,  $95.3 \pm 0.10^\circ \text{F}$  in group A, B, C and D respectively while rectal temperature was found  $102.8 \pm 0.13$ ,  $101.6 \pm 0.41$ ,  $102.3 \pm 0.32$ ,  $102.3 \pm 0.5^\circ \text{F}$ , respectively. The scrotal surface temperature was found lower than rectal temperature although the difference was non-significant ( $P > 0.05$ ). This might be due to the fact that temperature of scrotum is  $3-4^\circ \text{C}$  less than body temperature which is an essential prerequisite for normal spermatogenesis. The findings of present study is in agreement with Purohit *et al.* (1985) who reported that thermography of a normal scrotum of bull was characterized by a symmetrical and constant thermal pattern with a temperature gradient of 4 degrees to 6 degrees (C) from the base to the apex of the scrotum ( $34.94 \pm 0.60^\circ \text{C}$  to  $30.11 \pm 0.91^\circ \text{C}$ ).

**i. Ratio of total testicular weight to body weight:** The proportion of testicular weight to body weight was found as  $0.002 \pm 0.0003$ ,  $0.005 \pm 0.0002$ ,  $0.005 \pm 0.0004$  and  $0.004 \pm 0.0002$  in group A, B, C and D, respectively. It was observed that the ratio increased with the advancement of age as body weight and testicular weight both increased but it was observed that ratio was lower in group D it might be due to reason that the testicular growth becomes constant after 1 year although body weight of animal increased proportionately.

**Correlation between body weight, body measurements and scrotal morphology:** Body weight had positive and significant ( $P < 0.01$ ) correlation with body measurements and testicular measurements (Scrotal circumference, testicular length, testicular width, testicular thickness, scrotal volume). Testicular and scrotal parameters were positively correlated with each other ( $r = 0.696 - 0.941$ ,  $P < 0.01$ ). These results

are in agreement with the findings of Koyuncu *et al.* (2005) and Salhab *et al.* (2001). The observed high positive relationship among these characteristics indicates that any developmental change in one affects the other.

The results of the present study were found to be higher than the findings of Khan *et al.* (2006) who observed positive correlation of body weight with heart girth (0.64), body length (0.49) and height at wither (0.75) in Beetal goats while lower than that of Paul *et al.* (2011) in Black Bengal bucks, where body weight had highly significant correlation ( $P < 0.01$ ) with body length (0.954), chest girth (0.864), wither height (0.937), scrotal length (0.950) and scrotal circumference (0.953). This difference may be attributed to variation in breed, birth weight of the individual, agro-climatic conditions, nutrition, managemental condition and lower sample size of the present study. The relationship between body weight and chest girth can be explained by intimate association between body weight and growth of muscles, bones and visceral organs (Prasad *et al.*, 1981).

The findings of present study are in agreement with Alade *et al.* (2009) who also observed high and positive genotypic and phenotypic correlations of scrotal circumference with body weight and testicular weight. However, they obtained higher correlation of scrotal circumference with testicular weight than body weight. The high positive relationship between body weight, scrotal circumference and scrotal length further suggested that males with larger scrotal size might possess larger body size. However, the results of present study are in contrast to results of Okere *et al.* (2011) who reported negative correlation between body weight and scrotal circumference in Kiko bucks at pubertal age and higher than findings of Agga *et al.* (2011) who reported an intermediate correlation of BW with SC ( $r = 0.58$ ;  $P < 0.01$ ), while high correlation of SC to testicular diameter ( $r = 0.69$ ), testicular volume ( $r = 0.74$ )

## CONCLUSION

It can be concluded from the results of present experiment that mean body weight, body measurements and scrotal biometry values of local Pantja bucks available at Goat unit, Deptt. of LPM, College of Veterinary and Animal Sciences, Pantnagar and at farmers field of nearby area of Pantnagar lies between well-established breeds like Beetal, Barbari and higher than Black Bengal. Body weight has positive and significant ( $P < 0.01$ ) correlation with body measurements and testicular measurements (SC, TL, TW, TT, SV). Similarly, body measurements have positive and significant ( $P < 0.01$ ) correlation with body measurements and testicular measurements (SC, TL, TW, TT, SV).

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