



Short communication

Relationships between age, body measurements, testicular measurements and total ejaculation of semen in local goat of Rohilkhand region



S. Kerketta*, M. Singh, B.H.M. Patel, T. Dutt, D. Upadhyay, P.K. Bharti, S. Sahu, R. Kamal

LPM, Indian Veterinary Research Institute, Izatnagar, Bareilly, UP 243122, India

ARTICLE INFO

Article history:

Received 6 October 2014

Received in revised form 3 July 2015

Accepted 6 July 2015

Available online 15 July 2015

Keywords:

Buck
Scrotal circumference
Testicular volume
Body measurement

ABSTRACT

This study assessed the relationships between age, body conformation traits, testicular measurements and ejaculate volume of semen in local goat of Rohilkhand region maintained at Indian Veterinary Research Institute. A total of 33 bucks were categorized in to four groups viz. group 1: experienced (>2 years), group 2: non experienced adolescence (1–2 year), group 3: pubertal (6–12 m) and group 4: weaner (3–6 m). The linear traits: {chest girth (CG), height at withers (HAW), body length (BL), pelvic girth (PG)} and testicular measurements: {testicular circumference (TC), testicular length (TL), testicular width (TW), testicular thickness (TT) and testicular volume (TV) were measured. The scrotal division was graded from 0 to 5 scale}. Scrotal circumference (SC) increased with the advancement of age. The difference in the SC and TV was highest between Gr₃ and Gr₄ (5.43 cm and 57.68 ml). Similar trend was found for TL, TW and TT. Nearly 75%, 33.33% and 15.38% of bucks in Gr₁, Gr₂ and Gr₃, respectively, had distinct scrotal division. However, scrotal division was absent in Gr₄. The mean body weight of Gr₁ and Gr₂ differed significantly ($P < 0.05$). Similar trend was followed for HAW, BL, CG and PG. Body weight and body measurement in Gr₃ and Gr₄ were significantly ($P < 0.05$) lower than the Gr₁ and Gr₂. Body weight has positive correlation with all body measurements total ejaculation and testicular measurements except TT. Further, body parameters (BL, CG, PG) and SC found to be positively correlated with total ejaculation number. Similarly, body measurements were positive and significantly ($P < 0.05$) correlated with body weight, scrotal biometry, except CG and PG with TT. Mean body weight, body measurement and scrotal biometry values of local bucks of Rohilkhand region lies between established breeds like Black Bengal and Beetal bucks of India.

© 2015 Elsevier B.V. All rights reserved.

1. Introduction

Evaluation of suitability of the male, to be used as a breeder, is of paramount importance to achieve breeding success. Breeding soundness evaluation (BSE) predicts the potential fertility of a buck that includes tests for physical soundness, testicular size, semen quality, and in some cases, libido/mating ability (Okere et al., 2011). Measurement of testicular traits (scrotal circumference, testicular length etc.) during the period of adolescence can provide fair indication to find out the age at which the bucks can be used for breeding purpose. Marked increase in testicular size indicates the onset of

active spermatogenesis. Numerous studies have revealed that testicular growth and development are closely related to body size (Chenoweth et al., 2002; Raji et al., 2008). Body size and testicular measurements have been found to be important parameters for evaluating breeding soundness (Agga et al., 2011). Hence, investigation of various phenotypic measurements can be suitably used as selection criteria in goat genetic improvement programs. Although, well documented for descript goat breeds, information on body conformations, testicular traits and reproductive performance for local goats of Rohilkhand region is lacking. Therefore, an attempt was made to document body conformation and testicular traits and to determine relationship between them in local goat of Rohilkhand region.

* Corresponding author.

E-mail address: drspkvet@gmail.com (S. Kerketta).

Table 1
Mean \pm SE (cm) of different scrotal biometry and body measurements of bucks in different age group.

Parameters		Gr ₁	Gr ₂	Gr ₃	Gr ₄
Scrotal biometry					
Scrotal circumference		23.38 \pm 0.52 ^a	21.85 \pm 0.42 ^a	17.09 \pm 0.29 ^b	12.66 \pm 0.39 ^c
Testicular length	R	7.14 \pm 0.21 ^a	6.98 \pm 0.17 ^a	5.40 \pm 0.12 ^b	3.86 \pm 0.16 ^c
	L	7.13 \pm 0.21 ^a	6.98 \pm 0.17 ^a	5.38 \pm 0.12 ^b	3.85 \pm 0.16 ^c
Testicular width	R	4.63 \pm 0.12 ^a	4.18 \pm 0.10 ^b	4.63 \pm 0.07 ^c	2.33 \pm 0.09 ^d
	L	4.59 \pm 0.12 ^a	4.11 \pm 0.10 ^b	3.24 \pm 0.07 ^c	2.33 \pm 0.09 ^d
Testicular thickness	R	4.49 \pm 0.13 ^a	4.21 \pm 0.10 ^a	3.16 \pm 0.07 ^b	2.28 \pm 0.10 ^c
	L	4.46 \pm 0.12 ^a	4.32 \pm 0.10 ^a	3.15 \pm 0.07 ^b	2.30 \pm 0.09 ^c
Volume (ml)		216.25 \pm 10.01 ^a	165.00 \pm 8.17 ^b	96.27 \pm 5.55 ^c	38.39 \pm 7.56 ^d
Body measurements					
Body weight (kg)		35.27 \pm 0.84 ^a	21.68 \pm 0.69 ^b	10.62 \pm 0.47 ^c	9.01 \pm 0.64 ^c
Height at wither		73.19 \pm 1.24 ^a	64.46 \pm 1.01 ^b	49.12 \pm 0.69 ^c	49.50 \pm 0.94 ^c
Body length		72.81 \pm 1.05 ^a	63.08 \pm 0.86 ^b	48.60 \pm 0.58 ^c	46.82 \pm 0.79 ^c
Chest girth		80.50 \pm 1.02 ^a	66.54 \pm 0.84 ^b	51.92 \pm 0.57 ^c	49.43 \pm 0.77 ^c
Pelvic girth		82.56 \pm 1.17 ^a	68.83 \pm 0.95 ^b	56.73 \pm 0.65 ^c	54.64 \pm 0.88 ^c

Means bearing different superscript (a–d) differ significantly ($P < 0.05$) row wise.

2. Materials and method

2.1. Location of study and flock description

The present study was conducted in sheep and goat unit, LPM section, Indian Veterinary Research Institute, Bareilly (U.P.). Goats were maintained under stall-fed condition and housed in separate sheds, each attached with open paddock, which allowed the animals to loiter freely. Cultivated green fodders (maize/berseem/oat) and water was always available to the experimental animals.

2.2. Experimental design

Total 33 males of different age groups were categorized in to four group viz. group 1: experienced (>2years; $n = 4$); group 2: non experienced adolescence (1–2 year; $n = 6$); group 3: pubertal (6–12 months; $n = 13$) and weaner (3–6 month; $n = 10$). Body weight of the animals belonging to various age groups was recorded fortnightly. Body measurements of all the animals were recorded with utmost precision to the nearest centimeter scale with the help of measuring tape. The various body measurements studied were, chest girth (CG), height at withers (HAW), body length (BL) and pelvic girth (PG). Scrotal biometry included in study were scrotal circumference (SC) (Ahmed et al., 2004), testis length (TL; distance between distal and proximal poles of testes by vernier calipers), testis width (TW; measured at the same point where scrotal circumference was measured), testis thickness (TT) and Scrotal division (distance between tail of epididymis and septum). Scrotal skin thickness was measured by calipers after pushing the testes upwards. Thereafter values for TL, TW and TT were corrected by subtracting the values for scrotal skin thickness. The scrotal division was graded from '0 to 5' scale (Nunes et al., 1984). Testicular volume (TV) measured by water displacement method, by submerging testes completely in a container full of water and subtracting residual water. Six males from group I and group II utilized for the normative sexual behavior. Each male was observed 3 times for recording sexual behavior and with this ejaculation number was calculated.

2.3. Statistical analysis

The information collected by data sheet was pooled and analyzed as per standard statistical procedure (Snedecor and Cochran, 1994).

3. Results

The scrotal biometry and body measurements of the local goat in different age groups have been represented in Table 1. Increasing trend of scrotal circumference (SC) with the advancement of age was observed in the study. The difference in the SC between the age group was found highest between Gr₃ and Gr₄ (5.43 cm), which marginally decreased between Gr₂ and Gr₃ (4.76 cm). However, in Gr₁ scrotal circumference was marginally higher than Gr₂ which indicates that testicular growth retards after one year of age. Left TL in Gr₁ was almost double the length of Gr₄ (7.13 Vs. 3.85). Similarly, the difference in TL between Gr₃ and Gr₄ was almost 2 cm. However, the TL difference between Gr₁ and Gr₂ was marginal (0.15 cm). The testicular width (TW) also followed same trend with age. Left TL and left TW was marginally lower than right TL (although non-significant) in all the four groups.

Testicular thickness (TT) observed similar trend of TL and TW. The left and right TT was almost similar except in Gr₂ where left TT was marginally higher than right. Our findings indicate that the size of the testes varied in different age groups and even in between left and right testes of same age group.

The mean scrotal distance of Gr₁, Gr₂, Gr₃ and Gr₄ was 3.15, 2.3, 1.85 and 0.7 cm, respectively. Nearly, 75%, 33.33% and 15.38% of bucks in Gr₁, Gr₂ and Gr₃, respectively, had distinct separation between the epididymis. However, none of the animal showed any distinct scrotal division in Gr₄.

The testicular volume (TV) was highest in Gr₁ followed by Gr₂, Gr₃ and Gr₄. The testicular volume (TV) found significantly different ($P < 0.05$) between groups. The increment in TV was higher between Gr₃ and Gr₄ than between Gr₁ and Gr₂. The higher increment during growing phase of the animal (Gr₃ and Gr₄) might be due to physiological changes and growth of the testicular parenchyma.

The mean body weight in Gr₃ and Gr₄ found non-significant ($P > 0.05$) difference from each other while the body weight of Gr₁ and Gr₂ differed significantly ($P < 0.05$). Height at wither, body length, chest girth and pelvic girth also followed the same trend. Body measurements in Gr₃ and Gr₄ were statistically non significant with each other but significantly ($P < 0.05$) lower than the Gr₁ and Gr₂. Adult (Gr₁) body weight and body measurement of local bucks of Rohilkhand region were in acceptable limit to other recognized breeds (same sized).

Download English Version:

<https://daneshyari.com/en/article/2456863>

Download Persian Version:

<https://daneshyari.com/article/2456863>

[Daneshyari.com](https://daneshyari.com)