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Testicular morphometric characteristics in the non-descriptive breed of bucks

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Abstract
The testicular morphometry parameters were studied in the non-descriptive breed of bucks. A total 16 mature testicles (8 pair) were collected during the study from the Government approved slaughter house, in a sterile plastic bag with utmost care in air-tight sterile cryobox (4 to 5ºC) and brought to the laboratory within 2-4 hour after slaughtering the buck. The morphometric characteristics were measured using a non-stretchable measuring tape. The mean epididymal length, epididymal weight, testicular length, testicular weight, testicular diameter, testicular volume and testicular density of left testes were found 12.40±1.46 cm, 09.72±1.90 gm, 06.41±0.91 cm, 64.18±4.05 gm, 04.64±0.66 cm, 67.50±4.57 ml and 00.97±0.34 gm/ml, respectively and the corresponding values of right testes were 12.25±1.35 cm, 09.46±1.85 gm, 06.26±0.90 cm, 58.61±3.84 gm, 04.38±0.61 cm, 59.13±4.30 ml and 01.01±0.33 gm/ml, respectively. These parameters were correlated with one another and the values of the right testicular morphometry were compared with those of the left. The testicular length of right, left and combined testicular morphometry had highly significant (p<0.01) positive correlated with epididymal length (r = 0.73, p<0.05, r = 0.90 and r = 0.84), epididymal weight (r = 0.83, r = 0.96 and r = 0.92), testicular weight (r = 0.87, r = 0.89 and r = 0.89), testicular diameter (r = 0.92, r = 0.95 and r = 0.96) and testicular volume (r = 0.90, r = 0.89 and r = 0.90), respectively except for testicular density (r = -0.52, r = -0.32 and r = -0.43), which was non-significant (p>0.05). It was concluded that the testicular morphometry parameters in the study indicated non-significance (p>0.05) difference between the right and left testes.

Keywords: Correlation, cryobox, non-descriptive breed of bucks, non-stretchable measuring tape, testicular morphometry

Introduction
Goat population in India has recorded 135.17 million and Gujarat contributes 3.67% of total population (Annonymus, 2012) [3]. Goat sector contributes 8.4% to the India's livestock GDP (38,590 crores) through meat, milk, skin, manure and others. Moreover, goats have survived under diverse geographical situations by virtue of their high reproductive efficiency. They have readily adapted, acquired and resorted to rather limited seasonality, early sexual maturity, vigorous sex drive, high ovulation rate and multiple births to maintain their superior reproductive performance.

The morphometric analysis on the testes of any species or breed is necessary in predicting not only sperm production but also of the storage potentials and fertilizing ability of the breeder male. The testes size is a good indicator of the present and future sperm production in bulls (Togun and Egbunike, 2006) [9]. At present, paucity of information on the testicular morphometric characteristics and their application in the prediction of good sire in goat. Testicular measurement and the changes that occurs during growth of the testes from birth to maturity have however been well documented for goats (Bitto and Egbunike, 2006) [4]. rams (Setchell, 1978) [8]. and bulls (Willis, 2001 [10]. Dyce *et al.*, 2002 [5]). Therefore, the study was designed to examine the testicular morphometry of the non-descriptive breed of bucks.

Materials and Methods
A total 16 mature testicles (8 pair) were collected from the Government approved slaughter house after the sample was kept in a sterile plastic bag with utmost care in air-tight sterile cryobox (4 to 5ºC) and brought to the laboratory within 2-4 h after slaughtering the goat. The testes collected were separated from the epididymis afterward that testicular morphometric parameters were measured by standard method (Abdullahi *et al*., 2012) [1].

Data was reported as mean±S.E. and comparison of testicular morphometric parameters between left and right testicles were carried out with two sample "t" test (p<0.05) and finally correlation coefficient among testicular morphometry was carried out by MS Excel office.

Results and Discussion

The most of testicular biometry parameters of left side testes revealed numerically higher value as compared to right side testes (Table 1). However, the differences were non-significant between the left and right testicles, which were in agreement with the observations of Yaseen *et al*. (2010) [11]. in Marwari goats; Ajani *et al.* (2015) [2]. in the Red Sokoto buck (RSB) and Oyeyemi, (2012) [7]. in Sahel buck. Contrary to the above findings, significant (p<0.05) difference was observed by Gemeda and Workalemahu, (2017) [6]. in three indigenous breed of bucks in Ethiopia.

Table 1: Left and right side testicular biometry of slaughtered buck testes collected from slaughter house (n=8)

Sr. No.	Testicular Biometry/Morphometry	Left Testicles (n=8)	Right Testicles (n=8)	Average (n=8)	P value
1	Epididymal Length (cm)	12.40±1.46	12.25±1.35	12.33±1.41	0.88
2	Epididymal Weight (gm)	09.72±1.90	09.46±1.85	09.59±1.88	0.89
3	Testicular Length (cm)	06.41±0.91	06.26±0.90	06.34±0.91	0.72
4	Testicular Weight (gm)	64.18±4.05	58.61±3.84	61.40±3.95	0.49
5	Testicular Diameter (cm)	04.64±0.66	04.38±0.61	04.51±0.64	0.22
6	Testicular Volume (ml)	67.50±4.57	59.13±4.30	63.32±4.44	0.41
7	Testicular Density (gm/ml)	00.97±0.34	01.01±0.33	00.99±0.34	0.45

Means between left and right testicular biometry are non-significant (NS), p>0.05

The testicular length was significantly (p<0.01) higher positive correlated with the right and left testicular weight (r = 0.87 and r = 0.89); testicular diameter (r = 0.92 and r = 0.95) and testicular volume (r = 0.90 and r = 0.89), respectively (Table 2). The result of the study agreed with the finding of Oyeyemi *et al*. (2012) [7]. who reported testicular length was significantly (p<0.01) positive correlated with the right as well as left testicular weight (r = 0.760 and r = 0.740) and testicular diameter (r = 0.756 and r = 0.704), respectively.

Table 2: Correlation coefficient among various biometrical parameters of left and right side buck testicles collected from slaughter house

Testicular biometry/ Morphometry	EL (cm)	EW (gm)	TL (cm)	TW (gm)	TD_I (cm)	TV (ml)	TD_E (gm/ml)
Right testis (n=8)							
EL (cm)	--	0.85**	0.73*	0.39	0.47	0.55	-0.49
EW (gm)	0.90**	--	0.83**	0.65	0.76*	0.65	-0.25
TL (cm)	0.90**	0.96**	--	0.87**	0.92**	0.90**	-0.52
TW (gm)	0.81*	0.90**	0.89**	--	0.93**	0.94**	-0.40
TD_I (cm)	0.93**	0.96**	0.95**	0.95**	--	0.86**	-0.31
TV (ml)	0.93**	0.84**	0.89**	0.91**	0.95**	--	-0.67
TD_E (gm/ml)	-0.53	-0.17	-0.32	-0.15	-0.32	-0.53	--
Left testis (n=8)							

Correlation is significant at 5% level *p<0.05; Correlation is significant at 1% level **p<0.01

EL=epididymis length; EW= epididymis weight; TL=testicular length; TW=testicular weight; TD_I= testicular diameter; TV=testicular volume and TD_E=testicular density

In the study, positive correlations existed between the epididymal length and all the morphometric characteristics, except with the testicular density (Table 3). The results collaborated well with the results of Ajani *et al*. (2015) [2]. and Gemeda and Workalemahu, (2017) [6]. in different breed of bucks.

Table 3: Correlation coefficient among various biometrical parameters of combined (Right Plus Left) buck testicles collected from slaughter house

Testicular biometry/ Morphometry	EL (cm)	EW (gm)	TL (cm)	TW (gm)	TD_I (cm)	TV (ml)
EL (cm)	1					
EW (gm)	0.88**	1				
TL (cm)	0.84**	0.92**	1			
TW (gm)	0.65	0.81*	0.89**	1		
TD_I (cm)	0.76*	0.91**	0.96**	0.95**	1	
TV (ml)	0.79*	0.78*	0.90**	0.93**	0.91**	1
TD_E (gm/ml)	-0.57	-0.23	-0.43	-0.27	-0.34	-0.61

Correlation is significant at 5% level *p<0.05; Correlation is significant at 1% level **p<0.01

EL=epididymis length; EW= epididymis weight; TL=testicular length; TW=testicular weight; TD_I=testicular diameter; TV=testicular volume and TD_E=testicular density

On the basis of the study, it could be concluded that observations on testicular Morphometry parameters indicated non-significance (p>0.05) differences between the right and left testes. The coefficient correlation of epididymal length was found significantly (p<0.01) positive with epididymal weight and the testicular length was found significantly (p<0.01) positive with testicular weight and testicular volume.

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