

# Testicular Biometric Parameters and their Association with Body Weight in Stray Dog (*Canis familiaris*) of Junagadh, Gujarat

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## ABSTRACT

The present investigation was undertaken to examine testicular biometry parameters and their association with body weight in stray dogs. The study was conducted on testes of 18 adult, apparently healthy dogs captured and operated for sterilization at the Veterinary Hospital of Junagadh Municipal Corporation, Ivanagar, Junagadh. The testicular weight, volume, length, width, thickness and circumference were measured and examined. The testicular parameters did not differ significantly ( $p>0.05$ ) between left and right testis. A high and positive association, r-values being 0.432 to 0.989, was estimated among testicular parameters, viz., length, width, thickness, weight and volume of testis. However, the association of body weight with these testicular biometry parameters was non-significant ( $p>0.05$ ), the values being negative, low to medium in magnitude, ranging from -0.096 to -0.386.

**Key words:** Biometry, Correlation, Dog, Testis.

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## INTRODUCTION

Over the past few years, progress has been made towards a better understanding of mechanisms regulating canine reproduction, especially gamete maturation and development. Further, studies have also integrated molecular and imaging technologies to generate knowledge about reproductive ailments and to develop diagnostic tools for reproductive disorders in domestic dogs. In order to understand the fundamental structure and physiology of the dog testicles, more information is required. The changes in testicular biometry of dog are crucial for assessing their functionality. Higher observations of testicular parameters indicate internal changes and increased functionality with respect to sperm production which is essential for reproductive performance in dogs. Even the differences in testicular biometry parameters of left and right side have also attracted the attention of a few researchers (Bhagyalakshmi *et al.*, 2020; Kumar *et al.*, 2023; Yogesh *et al.*, 2023). However, there is a dearth of such documented information on the association between testicular parameters and body weight. In view of this, testicular biometry parameters and their association with body weight were studied in non-descript dogs.

## MATERIALS AND METHODS

The present investigation was conducted on testes of 18 adult and apparently healthy stray dogs during April-May, September-October, and December-January months, 6 in each, to have an overall picture of the entire year. Samples were collected from dogs captured and operated for sterilization

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–“Neutering”– at the Veterinary Hospital of Junagadh Municipal Corporation, Ivanagar, Junagadh (Gujarat, India).

The gross anatomical observations on body weight (kg), testicular weight (g), volume (cm<sup>3</sup>), length (cm), width (cm), thickness (cm) and circumference (cm) of left and right testes were measured. The body weight of dog and testicular weights were measured using a weighing scale. Testicular volume was measured using the graduated cylinder by water displacement method according to the Archimedes principles. Testicular length was measured from anterior to

posterior extremity. Testicular width was measured from the lateral surface to the medial surface and thickness was measured from dorsal border to ventral border at cranial, middle and caudal part of the testis. The average of the three values was considered. The values of testicular length, width and thickness were measured with the digital Vernier Caliper. Testicular circumference was measured at the thickest portion of the testis by a non-elastic thread and measuring scale. The average body weight of dog was 20.28±0.65 kg.

The data obtained were analysed statistically by one-way ANOVA and presented as means ± standard error (SE). The Pearson's correlations were worked out for body weight with testicular parameters and also amongst the later (Snedecor and Cochran, 1994).

## RESULTS AND DISCUSSION

### Testicular Biometry

The data of the testicular biometry have been presented for left and right testis in Table 1. These parameters were compared between two sides; the left and the right.

The mean weights and volumes of left and right testis of non-descript dogs studied did not differ significantly ( $p>0.05$ ), however numerically, left testis was 1.04% (+0.10 g) heavier as compared with that of right side (9.64 g), and testicular volume of both the sides was almost similar (9.10 to 9.12 cm<sup>3</sup>).

The length, width and thickness of the left and right testes did not differ statistically ( $p>0.05$ ), although the left testis was 2.01% (0.06 cm) longer and 4.72% (+0.10 cm) wider than that of right side, while thickness of testis of both the sides was almost equal (2.26 to 2.27 cm).

For left and right side testis, the circumference recorded was 7.62±0.23 and 7.49±0.24 cm, respectively. Though the difference was non-significant, circumference of left testis was 1.74% (+0.13 cm) more than that of right side.

Yogesh *et al.* (2023) reported the weight of left and right testis in the indigenous dogs of Mumbai as 14.95± 0.23 g and 14.32±0.26 g, respectively, while Kumar *et al.* (2023) recorded the weight of left and right testis of post-pubertal Indian Mongrel dogs as 10.38±1.30 and 10.50±1.25 g, respectively. The values of weight of left (9.74 g) and right (9.64 g) testis recorded in present study were comparatively lower than those observed by Yogesh *et al.* (2023) and Kumar *et al.* (2023). In the present study, the left testis was found to be heavier and wider than right testis, which is in consonance with the findings of Bhagyalakshami *et al.* (2020) and Yogesh *et al.* (2023) in dogs, Sikarwar *et al.* (2016) in pigs, and Karimi *et al.* (2019) in Gazel ram.

### Association of Body Weight with Testicular Biometry Parameters

The correlation matrix among body weight and testicular parameters of non-descript dogs is presented in Table 2. There existed a high and positive association, r-values being 0.432 to 0.989, among testicular parameters, viz., length, width, thickness, weight and volume of testis. However, surprisingly the association of body weight with testicular parameters were found to be non-significant ( $p>0.05$ ) and negative. The r-values were low to moderate in magnitude. The correlation coefficient value of body weight was maximum with testis width (-0.386) followed by that with circumference (-0.242). The r-value of body weight with

**Table 1:** Means ± SE for biometry variables of left and right testis of non-descript dogs

Variables of testis	Left testis (n=18)	Right testis (n=18)	p-value	Difference over right side	Difference %
Testis weight (g)	9.74 ± 0.71	9.64 ± 0.72	0.593	0.10	1.04
Testis volume (cm <sup>3</sup> )	9.10 ± 0.61	9.12 ± 0.62	0.740	-0.02	-0.22
Testis length (cm)	3.05 ± 0.09	2.99 ± 0.08	0.775	0.06	2.01
Testis width (cm)	2.22 ± 0.09	2.12 ± 0.09	0.521	0.10	4.72
Testis thickness (cm)	2.27 ± 0.07	2.26 ± 0.07	0.446	0.01	0.44
T. circumference (cm)	7.62 ± 0.23	7.49 ± 0.24	0.321	0.13	1.74

Means in a row did not differ significantly ( $p>0.05$ ) as analyzed by one-way ANOVA and the DUNCAN test.

**Table 2:** Correlation matrix among body weight and testicular parameters of non-descript dogs

Variable	B. Wt.	T. weight	Volume	Length	Width	Thickness	Circumference
Body weight	1.000						
Testis weight	-0.152	1.000					
Testis volume	-0.140	0.989	1.000				
Testis length	-0.096	0.772	0.761	1.000			
Testis width	-0.386	0.453	0.461	0.432	1.000		
Testis thickness	-0.169	0.848	0.835	0.640	0.510	1.000	
T. circumference	-0.242	0.968	0.951	0.726	0.540	0.881	1.000



**Table 3:** Regression analysis of body weight with testicular parameters in non-descript dogs (n=18)

Correlation of Body Weight with	Regression coefficient (b) along with SE	R <sup>2</sup>	P (two-tailed)	P-value summary (α = 0.05)
Testis weight (g)	-0.164±0.266	0.023	0.546	NS
Testis volume (cm <sup>3</sup> )	-0.128±0.225	0.020	0.578	NS
Testis length (cm)	-0.012±0.031	0.009	0.706	NS
Testis width (cm)	-0.061±0.036	0.149	0.113	NS
Testis thickness (cm)	-0.016±0.023	0.029	0.502	NS
Testis circumference(cm)	-0.086±0.086	0.059	0.332	NS

testicular weight, volume and thickness ranged from -0.140 to -0.169. Body weight was least associated with length of the testis (-0.096).

In contrast to the present finding, Samir *et al.* (2024) showed a strong positive correlation between the body weight of the male goats and testicular measurements. Their study revealed that the correlation of the body weight with testicular length was estimated to be 0.8 and with testicular diameter 0.7, which could be due to family/species difference. There has not been any other such documentation for comparing and discussing the current findings, and hence the reason for all such negative and low to medium correlation coefficient values remained obscure and area of interest.

Regression analysis of body weight with testicular weight, volume, length, width, thickness and circumference is detailed in Table 3. It revealed that with 1 kg increase in body weight, testis weight, volume, length, width, thickness and circumference reduced to the tune of -0.164 g, -0.128 cm<sup>3</sup>, -0.012 cm, -0.061 cm, -0.016 cm and -0.086 cm, respectively, although the values of these magnitudes were insignificant.

The findings of the study tended to indicate that, the testicular parameters of non-descript stray dogs do not differ significantly (p>0.05) by the side. A high and positive association (r=0.432 to 0.989) exists among testicular parameters, viz., length, width, thickness, weight and volume of testis. Although, the association of body weight with these testicular biometry parameters is non-significant (p>0.05), the values being negative, low to medium in magnitude.

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### REFERENCES

- Bhagyalakshmi, J., Balasundaram, K., Selvaraj, P., Kathirvel, S., Balachandran, P., & Chandana, G.S.S. (2020). Gross, histology and histochemical analysis of the testis in dog (*Canis lupus familiaris*). *Journal of Entomology & Zoology Studies*, 8(4), 69-73.
- Karimi, H., Saraskoundround, M.R., & Koucheh, F.B. (2019). Influence of laterality on testis anatomy and histology in Ghezel rams. *Veterinary Medicine and Science*, 5, 151-156.
- Kumar, K., Kannan, T.A., Geetha, R., Rao, G.V.S., Rengasamy, S., Ravali, K.S., & Khan, A. (2023). Gross and biometrical observations on the testis of Indian mongrel dogs (*Canis Lupus Familiaris*). *Indian Journal of Veterinary Anatomy*, 35(2), 156-158.
- Samir, I.A., Ali, F., Hassan, R.M., Nasra, A.Y., Ahmed, M.E., Rawia M.I., Ahmed E.N., Hussein A.H., & Nour, Y.S. (2024). Testicular biometry, spermigram, and biochemical parameters in male goats. *Egyptian Journal of Veterinary Sciences*, 55(3), 671-679.
- Sikarwar, S., Rakesh, M., Sanjeev, J., Pankaj, T., & Ashok, D. (2016). Gross and morphological studies on the testis of large white Yorkshire pig (*Sus Scrofa*). *Journal of Animal Research*, 8(4), 709-712.
- Snedecor, G.W., & Cochran, W.G. (1994). *Statistical Methods*. 8<sup>th</sup> edn., Iowa State University Press, Ames, Iowa, USA.
- Yogesh, Maan, K.S., & Gururaj, V.K. (2023). Gross anatomy and biometry of the testes of indigenous dog of Mumbai (*Canis domesticus*). *The Pharma Innovation Journal*, 12(11), 2188-2190.