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### Original article

## A biometric study of some reproductive components of the male domestic mongrel cat's (*Felis catus domestica*) in northwest Nigeria

M.A. Umaru<sup>a,\*</sup>, A. Bello<sup>b</sup>, D. Musa<sup>c</sup>, R.S. Dare<sup>b</sup>

<sup>a</sup>Department of Theriogenology and Animal Production,

<sup>b</sup>Department of Veterinary Anatomy Usmanu Danfodiyo University,

<sup>c</sup>Department of Agriculture, Sokoto State Polytechnic, Sokoto, Nigeria.

\*Corresponding author; Department of Theriogenology and Animal Production, Sokoto State Polytechnic, Sokoto, Nigeria.

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### ABSTRACT

A biometrical study was conducted on some aspects of the reproductive system of 16 local breed Tom cats (*Felis catus domestica*) collected within Sokoto metropolis at different ages. The age of the cats was estimated from teeth eruption and wearing and grouped into groups A to E as A (3- 6 months), B(6 months - 1 year), C(1- 1<sup>1</sup>/<sub>2</sub> year), D(1<sup>1</sup>/<sub>2</sub> -2 years) and E(2-4 years) respectively. Age difference was the major consideration factor during this study. The mean live weight of the tom cats were 0.78 ± 0.02kg, 1.25 ± 0.07kg, 1.63 ± 0.06, 2.1± 0.06kg and 2.3 ± 0.08kg respectively. The percentage of the mean genitalia weight compared to the mean body weight in relation to their age showed a range of 0.5-1%. The mean weight, length and width of the testes were recorded with no significant difference between the right and left testis. The mean weight of the genitalia at an age of 3-6 months was 8.4±0.02g. The age at puberty of tom cats was about 6months and the weight of the genitalia drastically increased with advancement in age from 8.88±0.07g at 6months-1year to 11.71±0.05g at above 4 years of age. The mean length and width of the penis were also recorded; the weights of the prostate gland were recorded with special consideration of their ages. The bulbourethral glands were present but hardly distinguishable grossly from the urethra both in length, width and in weight. It was concluded that the age of puberty of our domestic tom cat in this area is 6months of age. It was recommended that a thorough investigation on the age related

factor governing the development of anatomical features of the male reproductive tract of our domestic cat. The findings were discussed in the paper.

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## 1. Introduction

The reproductive Anatomy of the cat is unique amongst the domestic species in many respects (Getty *et al.*, 1975; Umaru and Bello, 2012). Domestic cats (*Felis catus domestica*), besides being a pet animal, also contribute as an experimental model in biomedical researches (Thomson and Marker, 2006), which helped in the study of approximately forty physiological anomalies in man and animals (Brewster, 1985); Including Immunological (Dyce *et al.*, 1987; Emerson and Hess 1996; Hena *et al.*, 2012), Reproduction (Amuller, 1998), toxicological (Emerson and Hess 1996), metabolic (HoËtzel *et al.*, 1995; Hena *et al.*, 2012), congenital (Dyce *et al.*, 1987; Sanchez *et al.*, 1993; Bello *et al.*, 2012) and oncological (Smuts and Bezuidenhout, 1987; Bello *et al.*, 2012b) concerns. Cats are frequently involved in pharmaceutical developments for human and veterinary used (Brewster, 1985; Bello *et al.*, 2012; Umaru and Bello, 2012) and are used in toxicity and security test for new drugs (Elcock and Schoning, 1984).

Little information is available regarding the morphology and biometry of the male genitalia of the domestic tom cat in North-western Nigeria.

This study describes the nature, types and dimensions of the tubular genitalia and some accessory sex glands of the tomcat. It examines if any the relationship between age and dimension of the male genitalia, it also compared the size of the male genitalia of the tomcat in relation to various age of the cat. The research will provide a base line data for the reproductive anatomy of the local Tom cat in Northwest, Nigeria.

## 2. Materials and methods

A total of Sixteen (16) Tom cat genitalia were used for the study, the cats were caught alive from Sokoto metropolitan area (Sokoto North and Sokoto South local government area) Sokoto State, Nigeria. Age difference was the major consideration during this study. The cats were weighted alive using compression spring balance (AT-1422), size C-1, sensitivity of 20kg X 50g in Kilogram (Ohaus scale crop) and were grouped and sacrifice according to through interval daily, the cat were grouped into groups from A to D as A(3- 6 months), B(6 months - 1 year), C(1- 1<sup>1</sup>/<sub>2</sub> year), D(1<sup>1</sup>/<sub>2</sub> -2 years) and E(2-4 years) respectively using their dentition as documented by Getty, (1986). All the cats were humanely euthanised.

A mid ventral abdomen incision was made on each animal, the peritoneum reflected, and the intestine displaced to gain access to the root of the reproductive system. A through morphometric observation of the external and internal genitalia were made insitu, before the consideration of the biometry. The length, weight, thickness and width or diameter of the various segments of the genitalia were measured using a meter ruler, measuring tape, dividers Vernier calliper and electrical weighing balance (Metler® 01210 instrument AG, Switzerland) with a sensitivity of 0.01g. The data obtained were subjected to statistical analysis using spss statistical software. Value of  $p < 0.05$  were considered significant

## 3. Results

Table 1-3 shows the results obtained. The mean live weight of the tom cat were  $0.78 \pm 0.02$ kg,  $1.25 \pm 0.07$ kg,  $1.63 \pm 0.06$ ,  $2.1 \pm 0.06$ kg and  $2.3 \pm 0.08$ kg respectively (Table 1). The percentage of the mean genitalia weight compared to the mean body weight showed a range of 0.5-1%. The mean weight, length and width of the testes were recorded with no significant difference between the right and left testis (Table 3). The mean length and width of the penis were also recorded the weight of the prostate gland were recorded with special consideration of their ages. The bulbourethral glands were present but hardly to differentiate with the urethra both in length, width and in weight (Table 2).

**Table 1**

Relationship between age, body weight and the weight of genitalia

Group	Age	No. of (n) Animals	Mean body Weight (kg) ± SEM	Mean genital weight (g) ± SEM
A	3-6 month	3	0.78±0.03 <sup>a</sup>	8.4 ± 0.02 <sup>b</sup>
B	6 months -1 year	3	1.25 ± 0.07 <sup>a</sup>	8.88 ± 0.03 <sup>b</sup>
C	1year-1 <sup>1</sup> / <sub>2</sub> year	3	1.63 ± 0.06 <sup>a</sup>	9.89 ± 0.05 <sup>b</sup>
D	1 <sup>1</sup> / <sub>2</sub> – 2 year	3	2.1 ± 0.06 <sup>a</sup>	11.48 ± 0.09 <sup>b</sup>
E	2 <sup>1</sup> / <sub>2</sub> - 4 years	4	1.3 ± 0.08 <sup>a</sup>	11.71 ± 0.05 <sup>b</sup>

ab: means on the same row with different superscripts are significantly different (P &lt; 0.05).

**Table 2**

Biometric values of the genitalia in relation to age

Group	No. of animals (n)	Mean body weight (kg) ±SEM	Mean weight of testis (g) ±SEM	Mean weight of prostate gland (g) ±SEM	Mean weight of genitalia (g) ± SEM
A	3	0.78 ± 0.02 <sup>a</sup>	1.12 ± 0.03 <sup>a</sup>	0.84 ± 0.01 <sup>a</sup>	8.4 ± 0.02 <sup>a</sup>
B	3	1.25 ± 0.07 <sup>b</sup>	1.26 ± 0.02 <sup>b</sup>	0.97 ± 0.03 <sup>b</sup>	8.88 ± 0.03 <sup>b</sup>
C	3	1.63 ± 0.06 <sup>c</sup>	1.48 ± 0.02 <sup>c</sup>	1.00 ± 0.02 <sup>c</sup>	9.89 ± 0.05 <sup>c</sup>
D	3	2.1 ± 0.06 <sup>d</sup>	1.92 ± 0.03 <sup>d</sup>	1.28 ± 0.01 <sup>d</sup>	11.48 ± 0.09 <sup>d</sup>
E	4	2.3 ± 0.08 <sup>e</sup>	2.08 ± 0.04 <sup>e</sup>	1.48 ± 0.05 <sup>e</sup>	11.71 ± 0.05 <sup>e</sup>

abcde: means on the same row with different superscripts are significantly different (P &lt; 0.05).

**Table 3**

Dimension of the prostate and penis of cat.

Organs	A	B	C	D	E
Prostate					
Mean length (cm) ±SEM	0.3 ± 0.01 <sup>a</sup>	0.8 ± 0.02 <sup>b</sup>	0.9 ± 0.01 <sup>c</sup>	1.0 ± 0.03 <sup>d</sup>	1.2 ± 0.07 <sup>e</sup>
Mean Width (cm) ±SEM	0.3 ± 0.01 <sup>a</sup>	0.3 ± 0.01 <sup>b</sup>	0.4 ± 0.01 <sup>c</sup>	0.4 ± 0.02 <sup>d</sup>	0.5 ± 0.02 <sup>e</sup>
Penis					
Mean Length (cm) ±SEM	1.2 ± 0.01 <sup>a</sup>	1.4 ± 0.02 <sup>b</sup>	1.6 ± 0.01 <sup>c</sup>	2.0 ± 0.01 <sup>d</sup>	2.1 ± 0.04 <sup>e</sup>
Mean Width (cm) ±SEM	0.5 ± 0.01 <sup>a</sup>	0.5 ± 0.01 <sup>b</sup>	0.5 ± 0.02 <sup>c</sup>	0.5 ± 0.02 <sup>d</sup>	0.6 ± 0.03 <sup>e</sup>

abcde: means on the same row with different superscripts are significantly different (P &lt; 0.05).

#### 4. Discussion

Grossly, the testes of the domestic cats are oval in shape, with the epididymis being clearly distinguished into the body and the tail. When viewed *insitu*, the testes and the epididymis are arranged in horizontal axis with the body of the epididymis being dorsal. The mean weight of the genitalia at an age of 3-6 months was shown to be 8.4±0.02g. The age of puberty of tom cat is 6-months and the weight of the genitalia increased with advancement in age from 8.88±0.07 at 6months-1year to 11.71±0.05g at above 4 years of age. The weight of the testes was shown increasing simultaneously with advancement in age from 1.12±0.03g at 3-6months to 2.08±0.04g at above 4 years. At this age an average of 1.60±0.25g were obtained. These findings show to be contrast to the work of Franco and Godinho, (2003) who showed that the testes of matured domestic cat weighs 1.2g though they showed that the domestic cat showed seasonality in testicular function hence the weight and size variation; depending on

the time in the year. Blottner and Jewgenow, (2007); and Sturnelli et. al (2009) emphasized that there is greater spermatogenic activity and higher testosterone concentration in long days than the short days and more in spring than in winter hence emphasizing the seasonal variation.

As shown in the table 3, the mean length of the prostate gland was found to be increasing from group A ( $0.3 \pm 0.001$ cm) to group E ( $1.2 \pm 0.007$ cm) while the mean width from group A ( $0.3 \pm 0.01$ ) to group E ( $0.5 \pm 0.02$ cm). The mean length of the penis was shown to be increasing in both width and length from group A ( $1.2 \pm 0.01$ cm) to E ( $2.1 \pm 0.04$ cm) and ( $0.5 \pm 0.01$ cm) to E ( $0.6 \pm 0.03$ cm) respectively. There was no specific data seen for these glands in domestic cat.

## 5. Conclusion

It was concluded that the age of puberty of our domestic tom cat is 6months of age depending on the nutritional status and it is also recommended that further investigation of the age related factors governing the development of anatomical features of male reproductive tract of our domestic cat in this area should be conducted in order to enhance better understanding of reproduction in cats.

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