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## Gross morphology and morphometry of testes during summer season in Vencobb broiler chicken

**Abinaya S, Jayachitra S and Hemavathi N**

### Abstract

Poultry testes are found in the posterior part of body cavity where they develop and perform spermatogenesis at high body temperature. In this study six apparently healthy Vencobb chicken were sacrificed and testes were collected and fixed in neutral buffered formalin. The gross morphology and morphometry were studied. Testes were creamy yellow in colour and surfaces were smooth and soft in texture. The weight ( $0.39\pm 0.04$  g), length ( $1.46\pm 0.05$  cm;  $1.26\pm 0.06$  cm) width ( $0.60\pm 0.03$  cm;  $0.56\pm 0.03$  cm) and thickness ( $0.32\pm 0.03$ ;  $0.31\pm 0.03$ ) of left and right testes were measured and recorded respectively. The body weight ( $1740.12\pm 69.76$  g) of the birds were measured to calculate Gonado-Somatic Index. This study will provide the basic knowledge about the gross morphology and morphometry of testes of Vencobb chicken and will be helpful to apply strategies for poultry farmers.

**Keywords:** Vencobb broiler, testes, gross morphology, morphometry, gonado-somatic index

### Introduction

A variety of scientific studies have been conducted on the anatomy and development of testes in various avian species. Kumaran and Turner (1949) [8] described the normal development of testes in White Plymouth Rock chickens from pre-hatch to sexual maturity. King and McLelland (1975) [7] and Razi *et al.* (2010) [14] examined the anatomical and histological development of the male reproductive system in adult native chickens and Iranian Native White Roosters respectively. Research on testis morphology, histology and spermatogenesis had been carried out in other avian species such as Japanese quail (Ibrahim, *et al.*, 2022) [6], ducks (Gerzilov, *et al.*, 2016) [5], turkeys (Aire and Ozegbe, 2007) [1], ostriches, and doves. Additionally, research on spermatogenesis in mammals, birds, and non-mammalian vertebrates (Pudney, 1995) [13] had contributed to our understanding of the developmental processes involved. For a long time, chickens had been used in laboratories, they were the first animals to be used to demonstrate inheritance, they were also the first animals to have their genome sequenced (Plachy, 2000) [12]. To investigate obesity and diabetes mellitus in human chickens were used (Dupont, *et al.*, 2012) [4].

Unlike in many mammals, poultry testes are found in the body cavity where they develop and perform spermatogenesis at high body temperature. Although a large range of literature on chicken testes were currently available, studies are scarce detailing Vencobb broiler chicken testicular gross morphology. Therefore, in this study, it is aimed to investigate the gross morphology and morphometry of both the testes of Vencobb broiler chickens aged 35-days-old.

### Materials and Method

The study was conducted on testes of six apparently healthy male vencobb broiler chicken birds (35 days old). The live body weight was recorded immediately after procurement of the birds. Birds were sacrificed ethically and body cavity was observed and photographed for the location, shape and colour of the testes. The testes were collected from carcass and weighed with digital weighing balancer and length, width were also measured. All the collected data were statistically analyzed by using IBM-SPSS statistics software. Gonado-somatic index (GSI) was calculated by using the formula below (Bachmid, *et al.*, 2019) [2].

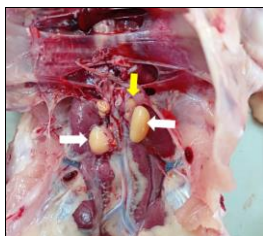
GSI (%) = weight of testes (g)/ weight of body weight (g) x 100

## Results and Discussion

The paired testes of Vencobb chickens were located within the body cavity on either side of median plane at their long axis. The testes were covered by peritoneal fold called mesorchium and attached to dorsal wall of body cavity. The left testes were bean shaped whereas right was oval, it varies depending upon the bird's age, breed & reproductive status. The colour of the testis was creamy yellow in colour which was distinguished from pink coloured visceral organs. The testis was placed symmetrically within the body cavity caudal to the respective lungs on either side of the aorta and posterior vena cava. Ventro-medial surface of the cranial lobe of the respective kidney is closely attached dorsally. Testes were ventrally related to proventriculus, liver and intestines. Lateral borders were convex, smooth while medial borders were depressed in the middle to lodge hilus. Cranial and caudal pole of testes were smooth and rounded. The cranial pole of the left testis reached upto left adrenal gland. Unlike mammals, birds do not have a distinct epididymis. Instead the seminiferous tubules directly connected to the vas deferens.

The average body weight of the birds was measured as 1740.12±69.76 g. The mean weight of both the testes was 0.39±0.04 g. Gonado-somatic index was calculated by using above formula. It was observed as 0.022% at the age of 35<sup>th</sup> day whereas Mahanta (2018)<sup>[10]</sup> observed 0.039% of GSI at 4 weeks old guinea fowl. Mfoundou, *et al.*, 2022 were recorded 0.01% of GSI in one-month old yellow feathered broiler chicken that indicates Vencobb chicken sexually matured earlier than yellow feathered broiler chicken. The high sperm production efficiency of birds in future would be determined based on the GSI values, because Cameron and Tilbrook (1990)<sup>[3]</sup> suggested that testes weight and sperm production were positively correlated.

The differences in their size and length could be noticed. The length and width of the right testis was measured as 1.26±0.06 cm and 0.56±0.03 cm respectively but the left was measured as 1.46±0.05 cm and 0.60±0.03 cm respectively. The thickness of right and left testis was 0.31±0.03 and 0.32±0.03 respectively. The left testis was larger and heavier than right one. This result was similar to the findings of Mahanta (2018)<sup>[10]</sup> in Guinea fowl. Thus, the present study will provide the basic gross morphological features of testes of vencobb chicken and will be helpful in breeding purpose.



**Plate 1:** Photograph showing intra-abdominal testes of Vencobb chicken (White arrow) and Adrenal gland (Yellow arrow)



**Plate 2:** Photograph showing fixed bean shaped left testes (L) and oval shaped right testes (R) of Vencobb chicken.

## Conclusion

The testes of vencobb broiler were paired and enclosed by mesorchium located intra-abdominally. The shape of testes was round to oval based on their age and reproductive status of the bird. The association of testes with other organs were observed and relationship between weight of the organ to the body was studied and recorded. Hence, this research will give a basic knowledge about testicles of vencobb broiler and will be helpful in future studies in the field of broiler production.

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