COMPARATIVE STUDY ON THE GROWTH OF BODY AND TESTES OF CATFISH (*Clarias gariepinus*) AND TILAPIA (*Tilapia niloticus*) REARED IN SOKOTO METROPOLIS

J. E. ONU, U. I. IBRAHIM AND A. BELLO
Department of Veterinary Anatomy, Faculty of Veterinary Medicine, Usmanu Danfodiyo University, Sokoto

ABSTRACT
A comparative study on the growth of body and testes of Catfish (*Clarias gariepinus*) and Tilapia (*Tilapia niloticus*) was done. A total of ten (10) male fish of each specie were used. Five male catfish and Tilapia were used at 2, 4 and 6 months of age. Mean body weights, absolute and relative weights of the testes of each specie were determined in grammes (g) and subjected to statistical analysis. The results showed that Catfish grew significantly ($p<0.05$) faster than Tilapia at 2, 4 and 6 monthsof age. The results further showed that the mean absolute weights of testes of Catfish were significantly ($p<0.05$) bigger than that of the Tilapia at 2, 4 and 6 months of age while the relative testicular weights of Tilapia were significantly ($p<0.05$) bigger than that of the Catfish at 2 and 4 of age. However, at 6 months of age, the relative weights of the testes of Catfish was significantly ($p<0.05$) bigger than that of Tilapia. The significance of these results is discussed.
Key Words: Catfish, Tilapia, Body weights, testes, testicular weights.

INTRODUCTION
A fish is any paraphyletic group of organisms that consist of all gill-bearing aquatic craniate animals that lack limbs with digits. Included in this definition are the living hagfish, lamprey, cartilaginous and and bony fish as well as various extint groups. Most fish are cold-blooded or ectothermic, allowing their body temperetures to vary as ambient temperature changes. Fish are abundant in most bodies of water and they can be found in nearly all aquatic environments (Nelson, 2006). However, some species of fishes such as the tuna, sword fish and some species of sharks show some warm-blooded adaptations (Helfman *et al*., 2009). Even though fish has been consumed by man over the years, malnutrition is still a serious problem being faced by millions of rural people and is caused by animal protein deficit diet (Everhart, 1975). Fish is said to provide at least 5% of daily protein requirement of 64g/individual/day, which is essential for proper growth, repair and maintenance of body tissues and organs of an individual (Esuruoso, 1999). With the ever increasing need for cheaper sources of ani mal protein to meet the world population, more and more attention is being focused on fish farming. In Sokoto metropolis, engagement in fish farming is just coming into being in recent years. The anatomy of the reproductive organs of Catfish in comparison with other species of fish remain an area yet to be explored. Although Catfish and Tilapia have been found to be most abundant in Sokoto metropolis and has been an addition to the animal protein source to human population, the reproductive anatomy is scarce in the literature, hence this study.

MATERIALS AND METHODS
Five life male Catfish and Tilapia at the ages of 2, 4 and 6 months were used. Sex differentiation was based on external appearance of the genital organs. The genital area is between the anus and anterior base of the anal fin. In the catfish, there is a genital pore on top of fleshly papilla located between the anus and the anterior base of the anal fin (Griffin, 2006). In Tilapia, the male are distinguished byb a protrusion of fleshy papilla between the anus and the anterior base of the anal fin (Reed, 1967). The fish were collected from Magatakarda Farms, Tashar Illela and Adiya Farms all in Sokoto metropolis. One species at a particular age was obtained at a time. The fish were placed in a bucket filled with water and transported to the Veterinary Anatomy Laboratory, Usmanu Danfodiyo University, Sokoto for the study. To determine the body weights, the head of the fish was struck with a strong object in order to immobilize it. After the immobilization,the fish is then place on Metler's Analytical Balance (PM16-K) and the body weights determined. A longitudinal midline incision was made from the anal opening the isthmus. The abdominal muscles were then trimmed to expose the in ternal organs. The intestine was then displaced to expose the testes which were the removed. Thereafter, the absolute weights of the testes were determined using Metler's Analytical Balance (PM16-K). The data generated were then subjected to statistical analysis using student t – test.

RESULTS AND DISCUSSIONS
The results of the study showed that Catfish grew significantly ($p<0.05$) faster than Tilapia at 2, 4

and 6 monthsof age. The results further showed that the mean absolute weigths of the testes of Catfish were significantly ($p<0.05$) bigger than that of the Tilapia throughout the study period while the relative weights of Tilapia were significantly ($p<0.05$) bigger than that of the Catfish 4 months of age. Furthermore, the results showed that the relative weigths of testes of Catfish were significantly ($p<0.05$) bigger than that of the Tilapia at 6 months of age. This study has shown that the Catfish grows faster than Tilapia and this attribute of Catfish will be of advantage to fish farmers who engage in Catfish farming. This implies more income to the farmers when compared to those raising Tilapia because of higher turnover. Consideration of the mean absolute weights of the testes showed significant difference between the two species. However the bigger testicular weights of Catfish observed could also be due to bigger body weight when compared with the Tilapia. The relative weights of the testes of the two species were variable as shown by the study. However, the bigger relative weights of testes at 6 months of age in Catfish is an indication that there is continual growth of testes in Catfish with increase in age as against corresponding decrease in relative weights of the testes with increase in age in Tilapia. However at 2 and 4 months of age, the relative weights of testes of Tilapia was bigger. Conclusion.

The results of this study showed that Catfish grows faster than Tilapia, therefore farmers are advised to grow Catfish since the species will ensure quick return of investment. It is recommended that more studies should be carried out in this area especially the determination of attainment of sexual maturity histologically. Similarly, the corresponding decrease in the relative weights of testes with increase in age in Tilapia needs further inquiry.

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Table 1. Comparison of body weights (g) of Catfish and Tilapia at 2, 4 and 6 months of age

Species of Fish	Age		
	2 months	4 months	6 months
Catfish	95.22 ± 8.86^{a}	180.80 ± 2.26^{a}	267.16 ± 9.04^{a}
Tilapia	31.44 ± 2.30^{b}	79.44 ± 5.38^{b}	128.30 ± 4.98^{b}

Means in the same row with different superscripts are significantly different ($p<0.05$)
Values are means ± standard error of 5 replications

Table 2. Comparison of absolute and relative weights of testes of Catfish and Tilapia

Species of Fish	Absolute weights of testes			Relative weights of testes		
	2 months	4 months	6 months	2 months	4 months	6 months
Catfish	0.88 ± 0.07^{a}	0.74 ± 0.06^{a}	2.14 ± 0.09^{a}	0.95 ± 0.05	0.41 ± 0.34^{a}	0.80 ± 0.02^{a}
Tilapia	0.33 ± 0.06^{b}	0.56 ± 0.05^{b}	0.58 ± 0.02^{b}	0.99 ± 0.17	0.70 ± 0.04^{b}	0.49 ± 0.02^{b}

Means in the same row with different superscripts are significantly different ($p<0.05$)
Values are mean ± standard error of 5 replications