

GROWTH PERFORMANCE AND CARCASS CHARACTERISTICS OF BROILER CHICKENS ON ORAL ADMINISTRATION OF *Lagenaria breviflora* (SPOTTED PUMPKIN) FRUIT EXTRACT

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ABSTRACT

This study was carried out to evaluate the effect of *Lagenaria breviflora* fruit extract on growth performance of broiler chickens. A total of one hundred and twenty fourteen-day old broiler chicks were divided into three treatments with four replicates and ten birds per replicate. The fresh fruits of *Lagenaria breviflora* were chopped and added at the rate of 75 g/L and 125 g/L of hot water in for 72 hours. At the end of 72 hours, the chopped *Lagenaria breviflora* fruits were removed. Treatment one served as the control while birds in treatment two and three were served 75 g/L and 125 g/L of *Lagenaria breviflora* fruit extract solution respectively for three days/week throughout the study period. Data collected were subjected to one-way Analysis of Variance (ANOVA) in a complete randomized design (CRD). The results showed that there was no significant ($P>0.05$) effect on growth indices at starter phase except water intake where birds on 75 g/L group recorded the highest intake. Feed conversion ratio was the only growth parameter significantly ($P<0.05$) affected at finisher phase and the best FCR (2.07 ± 0.06) was recorded from birds on 75 g/L. The study concluded that oral administration of *Lagenaria breviflora* fruit extract up to 75 g/L concentration improved the feed conversion ratio and water intake.

Key words: growth, broiler, *Lagenaria breviflora*, extract

INTRODUCTION

Poultry has been said to possess all the potentials required to be a sustainable enterprise in a rural set-up (Ja'afar-Furo and Gabdo, 2010). As a result of the ever-increasing need for meat, it was reported that poultry meat increased by 2.90% between 2010 and 2011 as against the 1.30% increase in pork and 0.10% increase in beef (USDA, 2011). However, various disease has been limiting the efficiency of this sector with combats made with antibiotics developed over the years. Diaz-Sanchez (2015) reported that the development of antibiotic resistant pathogens has resulted from the use of sub-therapeutic concentrations of antibiotics delivered in poultry feed. Studies have proven that the activities of phytobiotics in animal nutrition includes but not limited to stimulation of feed intake, antimicrobial, coccidiostatic, antihelmintic and immunostimulating (Panda *et al.*, 2006). *Lagenaria breviflora* (wild colocynth) is one of those numerous plants with characteristic antibacterial and antiviral herbal remedies in local communities such as Nigeria (El-Mahmood *et al.*, 2008). This study was designed to evaluate the effect of *Lagenaria breviflora* fruit extract on growth performance of broiler chicken.

MATERIALS AND METHODS

Experimental site: The experiment was carried out at the poultry unit of the Teaching and Research Farms, Federal University of Agriculture, Abeokuta, Ogun State, Nigeria. This area is situated in the rainforest vegetation zone of Southwestern Nigeria at $7^{\circ}13'49.46''N$, $3^{\circ}26'11.98''E$, and an elevation of 98 m above sea level.

Preparation of test ingredient: The fresh fruits of *Lagenaria breviflora* were chopped into smaller pieces with the aid of cutlass and added at the rate of 75 g/L and 125 g/L of hot water in separate drums. This was soaked for a period of 72 hours (3 days). At the end of 72 hours, the chopped *Lagenaria breviflora*

fruits were removed from the drum. The solution was sieved using a plastic sieve to remove seeds and smaller particles.

Management of the experimental birds: A total of one hundred and twenty two-week old broiler chicks was divided into three (3) treatments which was replicated four times with ten birds per replicate. Treatment one served as the control; conventional where birds had access to ordinary water and antibiotics was administered for 5 days in the first week of experiment. Birds in treatment two (2) and treatment three (3) were served 75 g/L and 125 g/L *Lagenaria breviflora* extract solution respectively 3 days/week throughout the study period. Commercial starter diet containing 23% CP and 2900-3100 Kcal/kg Energy was fed the first fourteen days and 20% CP and 2850 Kcal/kg Energy for the last twenty-one days. Water was given *ad-libitum*.

Data Collection: feed intake and water intake were carried out on daily basis, weight gain on weekly by subtracting leftover feed and water from the quantity supplied using digital sensitive scale of 2 decimal places and feed conversion ratio was calculated by the ration of feed : weight gain.

Data analysis: Data collected were subjected to one-way Analysis of Variance (ANOVA). Significant differences among treatment means were separated using Tukey's test as contained in the SAS program (SAS Institute Inc. 2010).

RESULTS AND DISCUSSION

The effects of different aqueous *Lagenaria breviflora* fruit extract concentration on growth performance of broiler chicken at starter phase is presented in Table 1. All the growth performance indices were not significantly influenced ($P>0.05$) except water intake which was significantly ($P<0.05$) affected by *Lagenaria breviflora* administration with birds on 75 g/L group having the highest value while the least value was recorded from the group on 125g/L level of extract concentration.

At finisher phase, growth parameters were not significantly ($P>0.05$) influenced except feed conversion ratio (Table 2). Chicken on 75 g/L *Lagenaria breviflora* administration had the best ($P<0.05$) FCR compared while the birds on 125g/L of the extract concentration had the poorest FCR. The birds in the control (Antibiotics) had a value which is similar to the birds on the two different concentration of the extract.

Table 1: Effects of *Lagenaria breviflora* fruit extract on growth performance of broiler chicken at starter phase

Parameters	Level (g/L) of <i>Lagenaria breviflora</i> fruit extract		
	0	75	125
Initial weight (g)	184.91±4.61	184.78±4.64	185.13±5.39
Final weight (g)	692.19±12.60	679.69±17.93	675.00±11.41
Weight gain (g)	507.28±15.16	494.91±18.24	489.88±15.01
Weight gain/day (g)	36.23±1.08	35.35±1.30	34.99±1.07
Total feed intake (g)	864.06±19.16	882.81±12.07	881.25±8.07
Feed intake/day (g)	61.72±1.37	63.06±0.86	62.95±0.58
Feed conversion ratio	1.71±0.03	1.79±0.07	1.80±0.05
Water intake/day (ml)	116.88±4.18 ^b	134.20±1.18 ^a	103.67±2.18 ^c

^{abc} Means with different superscripts on the same row are significantly ($P<0.05$) different.

Table 2: Effects of *Lagenaria breviflora* fruit extract on growth performance of broiler chicken at finisher phase

Parameters	Level (g/L) of <i>Lagenaria breviflora</i> fruit extract		
	0	75	125
Initial weight (g)	692.19±12.60	679.69±17.93	675.00±11.41
Final weight (g)	1955.58±24.85	2032.74±44.25	1956.03±9.51
Weight gain (g)	1263.39±24.63	1353.05±47.33	1281.03±10.53
Weight gain/day (g)	60.16±1.17	64.43±2.25	61.00±0.50
Total feed intake (g)	2832.81±26.68	2794.42±72.57	2981.56±39.71
Feed intake/day (g)	134.90±1.27	133.07±3.46	141.98±1.89
Feed conversion ratio	2.24±0.02 ^{ab}	2.07±0.06 ^b	2.33±0.04 ^a
Water intake/day (ml)	360.39±4.53	353.35±6.68	338.10±7.09

^{ab} Means with different superscripts on the same row are significantly (P<0.05) different

At starter phase, all parameters on growth performance of broiler birds across all treatment groups except water intake were not affected by *Lagenaria breviflora* inclusion. This was also reported by Oduwale (2014) who reported that supplementation of *Lagenaria breviflora* do not influence feed intake and weight gain of broiler birds early in life. Lee *et al.* (2004) verified that the bitter-tasting essential oils adversely affect water intake in broiler flocks. The significantly higher value obtained from birds placed on 75 g/L as compared to the significantly lower value recorded from birds on 125g/L may be as a result of the high concentration which might have induced a bitter taste. The water intake value recorded in this experiment is in agreement with the normal range of water consumption according to Fairchild and Ritz (2009) who reported that normal water consumption for chickens ranges from 1.6 to 2.0 times that of feed intake.

At finisher phase, best feed conversion ratio (FCR) was obtained from the group placed on 75 g/L *Lagenaria breviflora* fruit extract. This result is consistent with the findings of Al-Kassie and Jameel (2009) and Toghyani *et al.* (2011) who reported improved feed conversion ratio in their different studies on *Thymus vulgaris* (thyme) and *Cinnamomum zeylanicum* (cinnamon).

The improved performance of 75 g/L *Lagenaria breviflora* groups in terms of FCR may be due to the presence of active constituents like Pyrazolo[1, 5-c] pyrimidin-7-amine, 2, 5-dimethyl-, a class of pyrimidine which has been considered an effective antioxidant (Prasenzit *et al.*, 2010), phytochemicals such as saponins, terpenoids, flavonoids, etc.; which have been reported to show anti-inflammatory effects (Lui, 2003), exhibit analgesic properties (Malairajan *et al.*, 2006) and its antimicrobial and anti-diarrhea effect has been well documented (Kumar *et al.*, 2010). Adeyemi *et al.*, (2017) reported that the fruit of *Lagenaria breviflora* can positively contribute to the immune system of an organism which by extension improves performance.

CONCLUSION

The study concluded that supplementation of *Lagenaria breviflora* fruit extract at 75 g/L in drinking water of broiler birds improved water intake at starter phase but feed to gain ratio at finisher phase of broiler chicken.

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