GROWTH INDICES OF BROILER CHICKEN ADMINISTERED *LAGANARIA BREVIFLORUS* AT STARTER PHASE

Irivboje Oluwabusayo A* and Olufayo Omobola O.
*Department of Agricultural Technology, The Federal Polytechnic, Ilaro
Department of Animal Production Technology, The Federal Polytechnic, Ilaro
Corresponding author's email: simbiat.kareem@federalpolyilaro.edu.ng

ABSTRACT
Investigating how Laganaria breviflorus affected the broiler chickens' growth metrics was the aim of the experiment. The study included one hundred and fifty (150) day old broiler chicks. The birds were placed in a brooding pen after being weighed upon arrival. 28 days were used for the purpose of the experiment. Each of the five treatments (each containing thirty birds) was reproduced three times (each containing ten birds). Treatment 1 was the positive control (received all vaccinations), Treatment II was the negative control (received no dose of vaccination nor Laganaria breviflorus), Treatment III was 0.1 ml of Laganaria breviflorus), Treatment IV was 0.2 ml of Laganaria breviflorus) and Treatment V was 0.3 ml of Laganaria breviflorus). The acquired data were compared using Analysis of Variance (ANOVA), and the significance level was set at (P< 0.05). From the results, there was a significant (p>0.05) difference in the final weight, average weight, and FCR, with the maximum value being recorded by the birds on 0.1 ml. Mortality was also observed to be significant. The study concluded that 0.1 ml (T III) of Laganaria breviflorus influences the growth indices of broiler chicks at the starter phase.
Keywords: Chicks, Broiler, *Laganaria breviflorus,* growth, phytogenic

INTRODUCTION

Animal feed is supplemented with growth promoters, which are chemical and biological agents, with the goal of improving growth, feed utilisation, immune system stimulation and increased vitality, intestinal micro-flora regulation, and reduced mortality (Thomke and Elwinger, 1998), thus achieving a good production and reduction in the cost of production. Growth boosters are usually liver tonics that help the birds' hepatic activities (Mishra, 1991).

The procurement of feed additives in Nigeria's chicken industry costs millions of naira each year. It is possible to lower the cost of chicken manufacturing by focusing research on the use of natural phytogenic plant essential oils. Herbs, spices, and items derived from plants, are examples of phytogenic feed additives. According to Hemandez *et al*. (2004), these examples can be used in place of antibiotics as growth promoters in the broiler industry. A variety of plant extracts are tasty and possess antibacterial and digestive-stimulating characteristics. Herbs are important replacements for health and nutrition in the chicken business, according to Abdulmanan (2012), because they boost feed intake and the endogenous secretions may have antibacterial or anticoccidial properties.

Medicinal herbs like ginger, garlic, neem, and *Commiphora kerstingri* are among the most widely used growth promoters and can be used as antibiotic substitutes (Goji *et al*., 2009; Somboro *et al*., 2011). Extracts of plants, including leaves, roots, oil, seeds, bark, and other vegetative portions of the plant, have been exploited in experiments on chickens as a growth booster. Weight growth, feed conversion ratio, mortality, and liveability in poultry birds all improved dramatically as a result of specific herbal formulations, according to encouraging research.

Numerous species of gourd-bearing vines native to tropical Africa make up the genus *Lagenaria* (Morimoto *et al*., 2004). *Lagenaria breviflorus*, commonly known as Christmas melon, is a phytogenic plant that is commonly used in West African herbal medicines for its antibacterial and antiviral properties. It bears fruit in the dry season and flowers in the rainy season. Both people and animals use it as an herbal treatment. Rural poultry farmers have been using its extract indiscriminately to treat a variety of ailments, but no significant research has been done to confirm its effectiveness against various disease conditions.

Lagenaria breviflorus whole fruit is used to treat and prevent measles in people as well as Newcastle disease in poultry (Yasuyuki et al., 2005; Hanno *et al*., 2009; Adedapo and Bankole, 2011). Additional reported uses of the plant include antibacterial (Tomori *et al*., 2007), haematinic and

immune-stimulatory (Saba *et al*. 2009, Onasanwo *et al*., 2011), and miracicidal and cercaricidal (Ajayi *et al.*. 2002).
It was the aim of this study to test the effect of *Lagenaria breviflorus* (Christmas melon) on the growth indices of broiler chicks.

MATERIALS AND METHODS

The study was carried out at Poultry Unit of the Teaching and Research Farm of the Department of Agricultural Technology, The Federal Polytechnic Ilaro, Ogun State, Nigeria.

Preparation of *Laganaria breviflorus* Extract

The melon was washed and peeled to expose the mericarp after thoroughly washing them to remove all dirt. It was then sliced into bits to aid fermentation. A sealable container was used to store the sliced melon and water added in a ratio 1:2 (i.e. 15kg of *Laganaria breviflorus* to 30,000 mls of water). Seven days of fermentation were allowed to take place in the container covered with a lid. A fermented liquid was extracted from the mixture after seven days of fermentation. The liquid portion (*Laganaria breviflorus* extract) was refrigerated for preservation. The fermented extract was then mixed into 4 litres of water every morning for 28 days at 0.1% (400 mL), 0.2% (800 mls) and 0.3% (1200 mls) respectively

Management of experimental birds

One hundred and fifty (150) broiler chicks (day old) were purchased from an established poultry hatchery in Oyo State. In order to prevent the spread of disease on the farm, the pens were disinfected thoroughly before the arrival of the birds. The experiment lasted a total of 28 days, with strict adherence to the routine management upon arrival.

Administration of *Laganaria breviflorus* Extract

The *Laganaria breviflorus* extract was administered into the water of the bird for 28 days. The birds were divided into five treatments. In Treatment 1 (positive control), the birds received their recommended dosage of vaccinations on time. In Treatment 2 (negative control), the birds received neither vaccinations nor *Laganaria breviflorus* extract. In Treatment 3, 4 l of drinking water contained 0.1% (400 mL) *Laganaria breviflorus* extract; in Treatment 4, 4 litres of drinking water contained 0.2% (800 L) *Laganaria breviflorus* extract; and in Treatment 5, 4 litres of drinking water contained 0.3% (1200 mL) *Laganaria Breviflorus* extract. There are three replicates of each treatment, each containing ten birds.

Data Collection

The following data were collected on weekly basis;
Feed Intake
The feed intake and average feed intake was calculated using the formula;
Feed Intake = Total Feed Offered – Total Feed Leftover

$$\text{Average Feed Intake (g/bird)} = \frac{\text{Feed Intake}}{\text{No of birds per replicate}}$$

Body Weight Gain
Average Weight Gain (AWG) per bird was determined by dividing the Final Weight (FW) by the Initial Weight (IW) and multiplying this by the number of replicates.

$$\text{AWG (g/bird)} = \frac{\text{FW (g)} - \text{IW (g)}}{\text{Number of Birds Per replicate}}$$

Feed Conversion Ratio
The feed conversion ratio was calculated;

$$\text{FCR} = \frac{\text{Total Feed Intake (g)}}{\text{Weight Gain (g)}}$$

Statistical Analysis

The acquired data were compared using Analysis of Variance (ANOVA), and the significance level was set at ($P< 0.05$). To compare the data, Duncan's Multiple Range Test was employed.

Results and discussion

Table 1 explains the growth development of broiler chicks placed on *Laganaria breviflorus* extract. Mortality was seen to be more with birds in the positive control group (33.33%) which received no dose of *Laganaria breviflorus* but were vaccinated. Birds on 0.2% of *Laganaria breviflorus* extract had a high percentage of mortality (16.67%) when compared to the rest of the treatments. It is possible that the birds who received vaccine in T1 (+ve control) had a vaccine break, which prevents them from using the vaccine to its full potential. This is consistent with the findings of Bosha and Nonge (2012), who discovered that the vaccine's ineffectiveness stems from the birds' incapacity to mount a strong enough immune response following inoculation. This report contradict the research of Nworgu et al., (2018) who reported up to 95-100% survival rate of birds administered fermented *Lagenaria (Adenopus breviflorus)* Fruit extract. The variations observed in both findings could be as a result of difference in the level of inclusion. The administration of *Laganaria breviflorus* extract also significantly ($p<0.05$) affected the average weight gain, final weight gain, and feed conversion ratio with 0.1% recording the highest value while the least value was recorded in the +ve control group. This result indicated that at 0.1mL of *Laganaria breviflorus* extract can serve as a potent phytogenic growth promoter in broiler chicken. There is agreement with the article by Onibi *et al.*(2009), which asserts that medicinal plants may be used as an alternative to antibiotic growth promoters in poultry feeding because of their antimicrobial properties.

Table 1. Effect of Christmas Melon on Growth Indices of Broiler Chicken

Treatment	0% +ve	0% -ve	0.1%	0.2%	0.3%	SEM
Feed intake/bird/day (g)	42.34	26.11	25.74	27.50	25.74	105.26
Mortality (%)	33.33^{a}	10.00^{b}	10.00^{b}	16.67^{ab}	10.00^{b}	306.66
Initial body Weight (g)	66.33	65.33	64.00	66.00	68.00	18.40
Final body Weight (g)	582.86^{e}	728.60^{b}	786.20^{a}	642.86^{d}	695.40^{c}	145.33
Average Weight Gain	521.53^{d}	663.26^{b}	722.20^{a}	576.86^{c}	627.40^{c}	325.00
FCR	0.57^{a}	0.27^{b}	0.25^{b}	0.33^{ba}	0.28^{b}	0.19

$^{a,b,c:}$ Means on the same column having different superscripts are significantly ($p<0.05$) different

CONCLUSION

According to the study's findings, growth performance is improved when *Laganaria breviflorus* extract was administered at a dosage of 0.1 mL.

REFERENCES

Abdulmanan, C., N., Khan S, Qureshi, M. S., Altaf-Ur-Rehman and Jan, B. (2012). Effect of Periodic supplementation of herbal infusion on the liver function and lipid profile of broiler chicken. *Sarhad Journal of Agriculture*, 28(1):75-82

Adedapo, A. A. and B.O. Bankole. 2011. Ethnoveterinary survey of poultry management in some selected farms in Ibadan, Nigeria. *Recent Prog. Med. Plant* 31: 305-316.

Ajayi, G.O., Awujo N.C. and Abulu L.E.2002. The miracicidal and cercaricidal activity of the methanolic extracts of *Lagenaria breviflora* Robert Family Cucurbitaceae fruit on *Schistosoma mansoni*. *Nig. Qtr. J. Hosp. Med*. 12: 57-59.

Bosha, J.A. and Nongo, N.N. (2012). Investigating Vaccine Handling and Administration in Makurdi Metropolis, Benue State, Nigeria. Proceeding of 37th Conference of Nigerian Society of Animal Production (NSAP) held at University of Agriculture Makurdi, Benue State, Nigeria

Goji, A.D.T., Dikko, A.A.U., Bakari, A.G., Mohammed, A. and Tanko, Y. (2009). Evaluation of the Effect of Aqueous-ethanolic Stem Bark Extract of C*ommiphora africana* on Blood Glucose Levels of Alloxan Induced Diabetic Wistar Rats. *Asian Journal of Medical Sciences* 1 (2): 18-21.

Hanno, S., Christoph H. and Susanne, S.R. (2009). Gourds afloat: adapted phytogeny reveals an Asian origin of the gourd family (Cucurbitaceae) and numerous oversea dispersal events. *Proc. N. Soc*. 276: 843-845.

Hernández, F., Madrid, J., García, V., Orengo, J. and Megías, M. D. (2004). Influence of two plant extracts on broilers performance, digestibility, and digestive organ size. *Poultry Science*, 83, 169–174

Melillo A. (2013). Applications of serum protein electrophoresis in exotic pet medicine. *Veterinary Clinics of North America Exotic Animal Practice*; 16 (1):211-225.

Mishra. S. K. (1991).Effect of livol power on broiler chicks with aflatoxin contaminated feed. *Indian Journal of Indigenous Medicine*; 8:77-84

Morimoto Y., Gikugu M., Herwig T. and Maundu, P. (2004). Pollinators and biological diversity; the case of the bottle gourd *(Lagenaria siceraria*) in Kenya.

Nworgu, F.C Oladipo, T.A Nwufoh, O.C., Adeoye, Y.D., Adebayo, M.D and Ajayi, J.O. (2018). Effect of Fermented *Lagenaria (Adenopus breviflorus*) Fruit Extract on the Heamatological and Serum Biochemical Indices of Broiler Chickens. *Journal of Biology, Agriculture and Healthcare*, Vol.8, No.22, 2018.

Onasanwo, S.A., Saba, A.B., Oridupa, O.A., Oyagbemi A.A. and Owoyele, B.V. (2011). Anti-nociceptive and anti-inflammatory properties of the ethanolic extract of *Lagenaria breviflora* whole fruit in rat and mice. *Niger. J. Physiol. Sci*. 26:71-6.

Onibi, E.G., Adebisi, E.O., Fajemisin, N.A., and Adetunji, V.A. (2009). Response of broiler chickens in terms of performance and meat quality to garlic (*Allium sativum*) supplementation. *African Journal of Agricultural Research* 4(5), 511-517.

Saba, A.B., Oridupa, O.A., and Ofuegbe, S.O. (2009). Evaluation of haematological and serum electrolyte changes in Wistar rats administered with ethanolic extract of whole fruit of *Lagenaria breviflora* Roberts. *J. Med. Plants Res*. 3: 758-762.

Somboro, A.A., Patel, K. Diallo, D., Sidibe, L., Chalchat, J.C., Figueredo, G., Ducki, S., Troin Y., and Challard P. (2011). An ethnobotanical and phytochemical study of the African medicinal plant *Guiera senegalensis*, J.F. Gmel. *Journal of Medicinal Plant Research* 5(9): 1639-1651.

Thomke, S. and Elwinger.K. (1998). Growth promotants in feeding pigs and poultry; mode of action of antibiotics growth promotants, *Annales de Zootechnie*; 47:153-167, 1998

Tomori, O.A., Saba A.B., and Dada-Adegbola H.O. (2007). Antibacterial activity of ethanolic extract of whole fruit of *Lagenaria breviflora* Robert. J. *Anim. Vet. Adv*. 6: 752-757.

Yasuyuki, M., Patrick, M., Hiroshi F., and Hiroko, M. (2005). Diversity of landraces of the white-flowered Gourd (*Lagenaria siceraria*) and its wild relatives in Kenya. *Genet. Res. Crop. Evol*. 52: 737-747.