

GROWTH RESPONSE AND CARCASS CHARACTERISTICS OF BROILER CHICKEN SERVED WITH ETHANOLOIC *Peteveria alliaca* LEAF EXTRACT

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ABSTRACT

An experiment was conducted with three hundred day old broiler chicks to evaluate the effect of *Peteveria alliaca* leaf extract on growth response and carcass characteristics of broiler chicken in an 8 weeks trial. A total of one hundred and fifty (150) day old chicks of Arbor Acre strain were randomly allotted five treatment groups of 30 birds per treatment which were further divided into 3 replicates of 10 birds per replicate in a completely randomized design. The birds were brooded together for 7 days before the commencement of the experiment. Birds on treatment one (T1) were served with ordinary water, T2 were served with water containing enrofloxacin (antibiotics) at 1ml per 4 litres of water for 5 days both at the starter and finisher phase, T3, T4, and T5 were served with 0.033g of the extract/litre, 0.67g of the extract/litre and 0.10g of the extract/litre of water respectively throughout the experimental period. Parameter measured includes feed intake, weight gain, feed conversion ratio and percentage mortality while two birds per replicate making six (6) per treatment were randomly selected, slaughtered and dissected for carcass evaluation. Result obtained showed no significant ($P > 0.05$) difference in all growth parameters measured. All carcass parameters measured except eviscerated weight and head were not significantly ($p > 0.05$) influenced by the leaf extract. It can be concluded that farmers can serve their broilers with *Peteveria alliaca* leaf extract up to 0.10g/litre of water as phytobiotics without any detrimental effect on the growth response and carcass characteristics.

Key words: Broiler, growth response, leaf extract, carcass and *Peteveria alliaca*

INTRODUCTION

In modern animal feeding, the use of antimicrobial growth promoters (AGP) has led to the abandonment of herbs and spices. The benefit of AGP in improving weight gain and feed efficiency of broiler chickens are well established (Butaye *et al.*, 2003). The long term side effects of these products such as microbial resistance and increased blood cholesterol level of animals led to the ban of these commercial antibiotics (Mansoub, 2010). Nevertheless, the prohibition of most AGPs has necessitated renewed interest in animal feed strategies (Charis, 2000). The positive effects of herbal plants to broilers have been reported by Tekeli *et al.* (2006). Cross *et al.* (2007) pointed out that the efficiency of phytochemicals depends on differences in their chemical composition. *Peteveria alliaca*, has been found to contain a large number of biologically active chemicals including benzaldehyde, benzoic acid. The plants roots have been shown to contain cysteine sulfoxide derivatives that are analogous to, but different from those found in such plants as garlic and onion. These compounds serve as the precursors of several thiosulfinate such as S – (2 hydroxyethyl) 2 – hydroxyethane thiosulfinate, S – (2 hydroxyethyl) phenyl methane thiosulfinate, S – (benzyl 2 – hydroxyethane) thiosulfinate and S – (benzylphenylmethane thiosulfinate (petivenin). And these derivatives have been found to exhibit antimicrobial activity (Mild, 2004). Therefore, this study was carried out to evaluate performance and carcass characteristics of broiler chicken served with *Peteveria alliaca* leaf extract.

MATERIALS AND METHODS

Experimental location

The research was carried out at the Poultry research unit of the Federal College of Animal Health and Production Technology, Moor Plantation, Ibadan, Nigeria. The site is located in the rain forest zone of South-western Nigeria on longitude 7° 23' and latitude 4° 53' E and 76m above sea level. The climate is humid with a mean annual rainfall of 1037mm and mean temperature of 34.7°C, respectively. (Google Earth 6.0, 2016).

Source and Processing of *Petiveria alliacea*

Petiveria alliacea leaves were sourced from different locations within the Campus. The leaves were cut from the stem, cut into pieces, and 300g of it was weighed with digital scale and the leaves were mashed using mortar and pestle. It was soaked into 1liter of ethanol, and agitated manually for 7 days. After which, it was sieved manually with white cloth, the filtrate were subjected to double filtration using white man double filter paper. The filtrate was then evaporated using rotatory evaporator set at 80⁰c until all the ethanol evaporated completely. The extract was then freeze dried into a paste form.

Experimental plan

A total of one hundred and fifty (150) day old chicks of Arbor Acre strain were randomly allotted five treatment groups of 30 birds per treatment which were further divided into 3 replicates of 10 birds per replicate in a completely randomized design. The birds were brooded together for 7 days before the commencement of the experiment. Birds on treatment one (T1) were served with ordinary water, T2 were served with water containing enrofloxacin (antibiotics) at 1ml per 4 litres of water for 5 days both at the starter and finisher phases, T3, T4, and T5 were served with 0.033g of the extract/litre, 0.67g of the extract/litre and 0.10g of the extract/litre of water respectively throughout the experimental period. All vaccination procedures were strictly adhered to. Feed and water were supplied *ad-libitum* throughout the experimental period.

Data collection

Growth Response: Data on feed intake, weekly weight gain, average daily feed consumed and body gain, feed-to-gain ratio were obtained to evaluate the growth response of the experimental birds.

Carcass Traits: At the end of the feeding trial, two birds per replicate were purposively selected, starved overnight, weighed to obtain the live weight and was severed through the jugular veins for carcass analysis. Internal organs like heart, liver, kidney, lungs, abdominal fat and gizzard were weighed and recorded as well as all other parts and expressed as percentages of live weight.

Statistical Analysis: Data collected were subjected to analysis of variance (ANOVA), the treatment means were separated using Duncan's Multiple Range Test using SAS,2003.

RESULTS AND DISCUSSION

Table 1: Growth response of broiler chicken served ethanoloic *Pertiveria alliacea* leaf extract.

Parameters	T ₁ (0.0)	T ₂ (1ml/4L)	T ₃ (0.033g/L)	T ₄ (0.067g/L)	T ₅ (0.10g/L)	±SEM
Initial weight (g/bird)	286.00	278.70	278.30	284.70	291.70	3.78
Final weight (g/bird)	2233.30	2133.30	2220.00	2053.30	2360.00	83.08
Weight gain (g/bird)	1947.30	1854.70	1941.70	1768.70	2068.30	80.91
Feed intake g/bird	4906.70	4953.30	4820.00	4736.70	4566.30	73.18
Feed conversion ratio	2.55	2.71	2.62	2.76	2.21	0.13
Mortality(%)	6.67	3.33	6.67	0.00	0.00	1.87

Note: ^{a,b,c} means along the same row with different superscripts are significantly different (p<0.05)

All the growth parameters measured were not significantly (p> 0.05) influenced by the dietary treatments Table 1. Feed additives used as growth promoter improves palatability, nutrient utilization, stimulates appetite and increase flow of gastric juice (Odetola, *et al*, 2019). Supplementation of different levels of feed additives in broiler diets significantly improved the live weight gain and fed conversion ratio (Al-Kassie, and Jameel, 2009). Herawati (2010) recorded an increase in weight gain and improved feed conversion ratio when broiler birds were fed diets containing ginger as an additive. However, *Petiveria alliacea* leaf extract used in this study did not improve the

weight gain and feed conversion ratio of broiler bird compared to the control. This may be due to variability in the type of the leaf extract and the quantity served which may not be high enough to cause improvement in their performance. This result corroborate the study of Onibi *et al.* (2009) who reported no significant improvement in the weight gain and feed conversion ratio of broiler birds fed oregano oil and garlic as feed additive. This results also corroborate the results of earlier study by Odetola, *et al.* (2019) who reported a non significant improvement in the growth parameters when broiler birds were fed with *Petiveria alliacea* root meal. The carcass evaluation revealed that there were no significant ($p>0.05$) difference in all parameters measured except the eviscerated weight and head Table 2. The non significant effect recorded in this study indication that the leaf extract were well utilized by the broilers chickens. Cabuk *et al.* (2006) also reported that carcass characteristics of birds were not negatively affected when oregano leaf extracts were fed to birds.

Table 2: Carcass characteristic of broiler chicken served with varying inclusion levels *Petiveria alliacea* leaf extract (% of live weight)

Parameters (kg)	T ₁ (0.0)	T ₂ (1.5ml)	T ₃ (0.033g/L)	T ₄ (0.67g/L)	T ₅ (0.1g/L)	±SEM
Live weight	2.23	2.13	2.22	2.05	2.36	0.08
Eviscerated weight	79.49 ^{ab}	84.78 ^a	77.84 ^{ab}	73.15 ^b	83.78 ^{ab}	1.67
Dress weight	66.14	75.71	66.28	75.78	66.10	2.61
Thigh	18.56	21.69	19.86	17.72	13.15	1.40
Drum stick	10.21	10.86	9.95	10.67	10.18	0.21
Breast	23.15	22.29	24.38	20.58	24.71	0.64
Back	3.48	4.31	3.80	3.75	3.43	0.16
Wing	7.92	8.32	7.72	6.85	7.48	0.22
Head	2.88 ^{ab}	3.41 ^a	2.34 ^b	2.36 ^b	2.33 ^b	0.15
Leg	3.44	3.56	3.65	3.85	3.74	0.63
Neck	3.64	4.24	3.81	3.78	4.11	0.11
Liver	1.87	2.50	2.59	1.82	1.90	0.14
Heart	0.36	0.42	0.35	0.34	0.23	0.03
GIT	6.50	6.38	5.33	7.13	6.53	0.35

Note: a,b,c means along the same row with different superscripts are significantly different ($p<0.05$)

CONCLUSION AND RECOMENDATION

Based on the results of this study, it was recommended that farmers can serve their broilers with *Petevaria alliaca* leaf extract up to 0.10g/litre of water as phytobiotics without any detrimental effect on the growth response and carcass characteristics.

REFERENCES

- Al-Kassie, G.A.M and Y.J Jameel, (2009). The effect of adding Thyme vulgaris and Cinnamomum zeylanicum on productive performance in broilers. Proceedings of 9th Veterinary Scientific Conference, (VSC'09), Dokki, Giza, Egypt, pp: 223-231.
- Butaye, P., Devriese, L.A and Haesebrouk, F (2003). Antimicrobial growth Promoters used in animal feed: effects on less well known antibiotics on gram positive bacteria. *Clin. Microb. Rev.* 16: 175-188
- Çabuk, M. Bozkurt, M. Alçiçek, Akbaş, A and Küçükylmaz, K. (2006). Effect of a herbal essential oil mixture on growth and internal organ weight of broilers from young and old breeder flock s, *South Afric. J. of Ani. Sci.* 36 (2) 135-141
- Charis, K (2000). A novel look at a classical approach of plant extracts. *Feed Mix* (special issue on Nutraceuticals) 19-21

Cross, D.E., Mcdevit, R.M., Hillman, K and Acamovic, T (2007). The effects of herbs and their associated essential oils on performance, dietary digestibility and gut microflora in chickens from 7 to 28 days of age. *Brit. Poult. Sci.* 48: 496-506.

Google Earth, (2016). <http://www.goole.earth>

Herawati, (2010). The effect of feeding red ginger asphytobiotic on body weight gain, feed conversion and internal organs condition of broiler. *Int. J. Poult. Sci.*, 9: 963-967.

Mansoub, N.H (2010). Comparison of effect of using Nettle (*Urtica dioica*) and probiotic on the performance and serum composition of broiler chickens. *Glob. Vet.*, 8: 247-250.

Mild, C (2004). Smelly weed is strong medicine (PDF). Rio Delta wild. Retrieved 2010-04-05.

Onibi, G.E., Adebisi, O.E., Fajemisin, A.N and Adetunji, A.V (2009). Response of broiler chickens in terms of performance and meat quality to garlic (*Allium sativum*) supplementation. *Afr. J. Agric. Res.*, 4: 511-517.

Odetola, O.M., Adejinmi, O.O., Owosibo, O.A., Banjo O.T and Awodola-Peters, O.O (2019). Growth response, serum biochemistry and organ histopathology of broilers fed diets supplemented with graded levels of *Petiveria alliacea* root meal. *Int. J. Poult. Sci.*, 18: 45-50.

SAS, (2003). SAS[®]STAT User's Guide: Version 8 for Windows. SAS Institute Inc., Cary, NC., USA

Tekeli, A., Celik, L., Kutlu, H.R and Gorgulu, M. (2006). Effects of dietary supplemental plant extracts on performance, carcass characteristics, digestive system development, intestinal microflora and some blood parameters of broiler chicks. XII European Poultry Conference, Italy, 10-14, Sep 20.