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## EFFECT OF *PHYLLANTHUS AMARUS* FRESH LEAF INFUSION ON GROWTH PERFORMANCE AND CARCASS CHARACTERISTICS OF BROILER CHICKENS

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### ABSTRACT

This study was carried out to evaluate the effect of *Phyllanthus amarus* fresh leaf infusion on the growth performance and carcass characteristics of broiler chicken. A total of 66-day-old broiler chickens were allotted to two experimental diets in a completely randomized design. Chicks in Treatment 1 (T1) were served water without *Phyllanthus amarus* leaf, while those in Treatment 2 (T2) were administered 10g of fresh *Phyllanthus amarus* leaf in one litre of drinking water for 42 days of the experiment. Data obtained included weight gain, feed intake, feed conversion ratio, and carcass characteristics of the broiler chicken. Results obtained revealed that *Phyllanthus amarus* fresh leaf infusion at 1% had no significant influence on the growth performance broiler birds. Live (1675.00), slaughtered (1625.00) and carcass (1210.00) weights were significantly higher for birds on T1 compared to T2 (1495.00, 1355.00, and 1040.00, respectively). The dressing percentage ranged between 72.24 (T1) and 74.02 (T2). Thigh weight was significantly higher (11.37) in birds on T1 compared to T2 (9.72) while other primal cuts were not significantly influenced. Internal and External offal were significantly influenced by *Phyllanthus amarus* fresh leaf infusion except for gizzard and proventriculus, then liver and bile. Hence, it is concluded that fresh *Phyllanthus amarus* leaf infusion at 1% did not affect the growth performance of broiler chicken, except for the carcass characteristics with better dressing percentage and offal.

**Keywords:** Growth, carcass, broiler chicken, *Phyllanthus amarus* leaf

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### INTRODUCTION

The overall well-being of an animal is crucial to the development and performance of that animal. Chicken is the most commonly farmed species, with over 90 billion tons of chicken meat produced per year and poultry meat has been regarded as the second-largest global food commodity (Manning *et al.*, 2006; Agyare *et al.*, 2016; FAO, 2017). In most countries, many antimicrobials are used to raise poultry birds, and most antimicrobials are considered essential in human medicine (Sahoo *et al.*, 2010); Landers *et al.*, 2012; ;Boamah *et al.*, 2016 . However, the excessive use of antibiotics in poultry production is becoming alarming even though the use of antibiotics as growth promoters in food animals has been banned in most parts of Europe (Boamah *et al.*, 2016), and this is due to the residual effects on humans who consume these animal products. The use of phytobiotics has proved to be a substitute for antibiotics in livestock production.

*Phyllanthus amarus* popularly known as stone breaker is a medicinal plant commonly found in most tropical regions. Traditionally, the therapeutic efficacy of *Phyllanthus amarus* has been effectively used to treat several ailments such as malaria, diarrhoea fever, stomach pain, analgesic, jaundice, etc. (Patel *et al.*, 2011). *Phyllanthus amarus* has numerous phytochemical constituents such as alkaloids, flavonoids, sterol, tannins, lignin, polyphenolic compounds, and tetracyclic triterpenoids (Patel *et al.*, 2011; Devi *et al.*, 2017). *Phyllanthus amarus* has been proven also to have antimicrobial, anti-inflammatory, and powerful antioxidant properties (Devi *et al.*, 2017). Previous studies of Jimoh *et al.* (2020) on the response of growing rabbits fed *Phyllanthus amarus* leaf meal supplemented diets showed that 4% inclusion of *Phyllanthus amarus* in rabbit diets appears to act as a growth promoter with no negative effect on health status. However, there is a dearth of literature on the effect of *Phyllanthus amarus* on the growth performance and carcass characteristics of broiler chickens. Therefore, this study aimed at determining the efficacy of *Phyllanthus amarus* on the growth performance and carcass characteristics of broiler chickens.

## MATERIALS AND METHODS

### *Experimental site*

The experiment was carried out at the Brooder Unit of the Department of Animal Production, Lagos State University of Science and Technology, Ikorodu, Lagos State.

### *Experimental animals, management and design,*

A total number of sixty-six day-old broiler chicks were used for this study. The birds were randomly allotted to two treatments and three replicates, with thirty-three birds per treatment

Birds on T1 (control) were given plain water while T2 was placed on 10g/litre freshly ground *Phyllanthus amarus* leaves water, without antibiotics throughout the experimental periods. The birds were fed commercial broiler starter and broiler finisher, with estimated nutrient levels of 22.5% crude protein, 3143kcal/kg Metabolizable energy and 21.0% crude protein 3140kcal/kg Metabolizable energy respectively. *Phyllanthus amarus* leaves were harvested within the University premises. Feed and water were supplied *ad libitum*. Other management practices were strictly adhered to and the experiment lasted for 42 days.

### *Data Collection*

Data on feed intake and weight were collected weekly. Feed conversion ratio and protein efficiency ratio were determined as:

$$\text{Feed conversion ratio (FCR)} = \frac{\text{Average feed intake (g)}}{\text{Average weight gain (g)}}$$

### *Carcass evaluation*

At the end of the 42 days, three (3) birds were selected at random from each treatment to determine carcass characteristics. The birds were fasted overnight, weighed, slaughtered and bled by severing the jugular vein with a sharp knife. To achieve complete bleeding; each slaughtered bird was hung with legs until the cessation of blood drop. Defeathering was done using warm water at 60°C and then followed by evisceration. The primal cuts and organs were weighed and expressed as percentage of live weight.

### *Statistical analysis*

The data collected were subjected to T-test using Assistant Software 7.6 Beta, developed by Silva and Azevedo (2016).

## RESULTS AND DISCUSSION

Table 1 shows the growth performance indices of broiler chicken given fresh *Phyllanthus amarus* leaf in drinking water. The result showed no statistical variation ( $p > 0.05$ ) in the final body weight, weight gained, feed intake and feed conversion ration of the birds in the control and birds placed on fresh *Phyllanthus amarus* leaf infusion. The non-significant difference in the growth parameters of this study indicated that fresh *Phyllanthus amarus* leaf infusion does not have incremental effect in the performance of the birds. Though, birds in the control had higher weight gain value with lesser feed intake and not able to utilize the feed efficiently as those on fresh *Phyllanthus amarus* leaf infusion.

**Table 1: Growth performance of broilers given *Phyllanthus amarus* leaf in drinking water**

Parameters	T1 (Control)	T2 (Fresh Leaf)	SEM
IBW (g <sup>-1</sup> bird)	41.13	39.90	0.62
FBW (g <sup>-1</sup> bird)	1785.33	1741.33	22.00
AWG (g)	1744.30	1701.40	21.45
AFI (g)	640.00	660.00	10.00
FCR	2.15	2.03	0.06

IBW = Initial body weight; FBW = Final body weight; AWG = Average weight gain; AFI = Average feed intake; FCR = Feed conversion ratio.

This finding is in line with the report of Nguyen and Nguyen (2012) reported that using different levels (0.25 to 1.5%) of *Phyllanthus amarus* powder in the diets had no effects on the growth performance of chicken. Pasaribu *et al.*, 2023 also reported that *P. niruri* L. powder (Meniran powder, MeP) supplementation at a level of 0.02-0.05% in broiler chickens did not affect ( $P > 0.05$ ) their body weight compared to the control. But in contrast, Jagadeeswaran and Selvasubramanian (2014) reported that 1% of *P. nitruri* L. crude powder could improve the body weight of broiler. Also, Natsir,

*et al.* (2013) suggested that 0.8 per cent encapsulated combination of garlic and *Phyllanthus niruri* in broiler diet improved performance. However, the variation in this findings and other reports could be associated with the mode of presentation of the *Phyllanthus niruri* to the birds.

The effect of *Phyllanthus amarus* leaf in drinking water on carcass characteristics of broiler chicken is presented in Table 2. There exist significant ( $p < 0.05$ ) difference between chicken not given fresh *Phyllanthus amarus* leaf infusion and birds served placed on *Phyllanthus amarus* leaf infusion except dressing percentage and drumstick. Live weight, slaughter and carcass weights were significant ( $p < 0.05$ ) higher birds on T1 (1675.00, 1625.00, 1210.00, respectively) compared to T2 (1495.00, 1355.00, 1040.00, respectively). However, the dressing percentage though not significant was higher (74.02) in birds on T2 compared to T1 (72.24). This result is in agreement with the findings of Astuti and Suripta, (2020) who reported that carcass percentage of broiler chicken given *Phyllanthus niruri* L. and *Moringa oleifera* had no significance. Similarly, there was not significantly ( $p > 0.05$ ) difference in the relative weights of the primal cuts of birds placed on *Phyllanthus amarus* in drinking water and the control except the thigh which was significantly ( $p < 0.05$ ) higher (11.37) in the control compared with T2 (9.72). This result agrees with the findings of Shafey *et al.* (2013) who reported no significant difference ( $P > 0.05$ ) in eviscerated carcass of broiler chicken fed olive leaves extract (Oleuropein). But in contrast, Onwujiariri *et al.*, (2019) reported significant influence in carcass parameters for birds administered *Phyllanthus amarus* extract at 1.5% inclusion level. The relative weight of neck, and head were significantly ( $p < 0.05$ ) influenced by the treatment. Furthermore, Ghazalah and Ali (2008) noted that the use of herbs and its derived products in livestock feed and water stimulated effective use of feed nutrient which may result in more efficiency. The improved relative weight of drumstick, thigh and breast of birds in T1 might be because of the higher feed intake which accumulated into more muscle/meat in the birds.

**Table 2: Carcass characteristics of broiler given *Phyllanthus amarus* leaf in drinking water**

Parameters	T1 (Control)	T2 (Fresh Leaf)	SEM
Live weight(g)	1675.00 <sup>a</sup>	1495.00 <sup>b</sup>	90.00
Slaughtered weight (g)	1625.00 <sup>a</sup>	1355.00 <sup>b</sup>	135.00
Carcass weight (g)	1210.00 <sup>a</sup>	1040.00 <sup>b</sup>	85.00
Dressing percentage (%)	72.24	74.02	0.89
Drum stick (%)	9.94	9.29	0.33
Thigh (%)	11.37 <sup>a</sup>	9.72 <sup>b</sup>	0.82
Wing (%)	7.40	7.54	0.07
Back (%)	14.51	13.35	0.58
Breast (%)	22.15	22.03	0.06
Head (%)	2.54 <sup>a</sup>	2.28 <sup>b</sup>	0.13
Neck(%)	3.58 <sup>b</sup>	5.02 <sup>a</sup>	0.72
Spleen(%)	0.06 <sup>b</sup>	0.07 <sup>a</sup>	0.01
Liver and bile (%)	2.18	2.17	0.01
Kidney (%)	0.42 <sup>a</sup>	0.36 <sup>b</sup>	0.03
Lungs (%)	0.51 <sup>b</sup>	0.64 <sup>a</sup>	0.07
Heart (%)	0.18 <sup>b</sup>	0.28 <sup>a</sup>	0.05
Gizzard and Proventriculus (%)	2.06	2.28	0.11

### CONCLUSION and Recommendation

From the result of this study, *Phyllanthus amarus* leaf infusion at 1% in drinking water of broiler chicken neither enhanced nor had adverse effect on growth performance and carcass characteristics. Therefore, it is suggested that further study to identify the level of infusion that would enhance the performance in broiler chicken should be considered.

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