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GROWTH PERFORMANCE AND CARCASS CHARACTERISTICS OF BROILER CHICKENS ADMINISTERED ORAL AQUEOUS EXTRACTS OF *OCIMUM GRATISSIMUM*

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Abstract

This study aimed at investigating the effect of scent leaf (*Ocimum gratissimum*) administered orally on growth performance and carcass traits of broiler chicks. Two hundred (200) day old broiler chicks used for the study were assigned in a completely randomized design (CRD) to five treatment groups (four replicates per treatment with ten birds per replicate) identified as T1, T2, T3, T4 and T5 (0ml without antibiotics, 0ml with antibiotics, 0.2ml, 0.4ml and 0.6ml aqueous extract of *Ocimum gratissimum* administered orally, respectively). Data were obtained on body weight and feed intake. Different carcass traits were evaluated by sacrificing two birds per replicate. The final body weight, weekly body weight gain and feed intake were significantly ($P < 0.05$) influenced by the oral administration of aqueous extract of *Ocimum gratissimum*. Chicks on T3 (0.2ml administration) and T5 (0.6ml administration) were 1915.000 and 1880.00g heavier than those in the control group but there was no significant difference ($p > 0.05$) in feed conversion ratio. The dressed weight and dressing percentage decreased significantly ($p < 0.05$) with increasing levels of the oral administration of the aqueous extract of *Ocimum gratissimum*. It could be concluded that the use of *Ocimum gratissimum* leaf extracts administered orally in the production of broiler had no detrimental effect on the performance of broilers. However, *Ocimum gratissimum* leaf extracts administered up to 0.6ml improved growth performance of broiler chicks.

Keywords: Antibiotics, Carcass, Dressing Percentage, Growth

Introduction

Antibiotics have been widely used in chicken production, not just to prevent and treat infections, but also to increase meat and egg production (Ogle, 2013). Antibiotics have been outlawed in a number of nations due to their detrimental consequences for both animals and humans, including bacterial resistance and residues in animal products (Mansoub, 2010). Herbs and spices, in the form of dried plants or plant parts, as well as extracts, can be added to feed to provide health advantages (Frankic et al., 2009). *Leuceana leucocephala* (Hussaini, et al., 1991), *Chromolaena odorata* (Akintunde et al., 2021), and *Moringa oleifera* seed have all been used in broiler diet (Akintunde and Toye, 2014). Another useful herbal leaf for poultry nutrition is scent leaf (*Ocimum gratissimum*) (Olumide and Akintola, 2018; Olumide et al., 2018). Scent leaf (*O. gratissimum*), an African variation of basil (*Ocimum*), is widely planted as a perennial herb in tropical Africa, Southeast Asia, India, and Hawaii. It is well-known for its numerous nutritional, anesthetic, and medicinal applications all over the world (Gill, 1992). According to Ijeh et al. (2004) and Olumide et al. (2018), scent leaf is high in alkaloids, tannins, phytate, flavonoids, oligosaccharides, terpenoids, thymol, and saponin, with a low cyanogenic concentration.

However, there appears to be a scarcity of documented/published research on the use of fragrance leaf extract as an antibiotic substitute in broiler chickens. This study was carried out to examine the growth performance and carcass characteristics of broiler chicks presented with aqueous extract of *Ocimum gratissimum*.

Materials and Methods

This study was carried out at the Teaching and Research Farm of Babcock University, Ilishan-Remo, Ogun State, Nigeria. Two hundred day old broiler chicks were purchased from a commercial hatchery in Ibadan, Nigeria. The chicks were allotted in a completely randomized design (CRD) to five treatment groups designated as T1, T2, T3, T4 and T5 (0ml without antibiotics, 0ml with antibiotics, 2ml without



antibiotics, 4ml without antibiotics and 6ml without antibiotics of the aqueous extract of scent leaf respectively). Each treatment group had four replicates with 10 chicks per replicate.

Fresh scent leaves were harvested within the campus of Babcock University, Ilishan-Remo, Ogun State, Nigeria. The leaves were harvested around 6:00hrs and 6:30hrs every morning for the first 5 days of the starter and finisher phase. 20g of the fresh leaves harvested were blended with 100ml of water using a blender. The blended samples were well filtered using standard filter papers. The filtrates were then measured according to the treatment groups and administered orally to each bird. The extract was prepared daily and used.

The standard management procedures were followed. Throughout the trial, the chicks were fed *ad libitum*, starter and finisher diets were compounded as presented in Table 1. The birds were fed a weighed amount of feed every day, and their body weight was monitored on a weekly basis. The weekly feed intake and body weight growth were calculated using the data obtained on these parameters, as well as the feed conversion ratio.

Two birds were randomly selected from each of the replicates for carcass examination at the end of the 6-week feeding study. The live weights of the selected birds were recorded after they were deprived feed overnight. All data was treated to SPSS (1999) analysis of variance (ANOVA), and significant means were separated using the same software's Duncan multiple range test.

Results

Table 1: Gross composition of experimental starter and finisher diet (g/100g)

Ingredient	Broiler starter	Broiler finisher
Maize	53.00	58.00
Soybean meal	37.00	27.00
Wheat offal	4.59	9.64
Palm oil	2.00	2.00
DCP	1.50	1.50
Oyster shell	1.00	1.00
Salt	0.25	0.25
Broiler Premix	0.25	0.25
Methionine	0.30	0.25
Lysine	0.05	0.05
Avatec	0.06	0.06
Total	100.00	100.00
Calculated Nutrients		
Crude Protein (%)	22.34	20.00
Metabolizable Energy (Kcal/Kg)	2982.83	2890.45

Table 2: Performance Characteristics of Broiler Chickens to Oral Administration of Aqueous Extracts of *Ocimum gratissimum*

Treatments/ Parameters	T1	T2	T3	T4	T5	SEM
Initial weight (g/bird)	40.00	41.00	40.00	41.00	42.00	5.05
Final live weight (g/bird)	1787.50 ^a	1837.50 ^a	1915.00 ^b	1787.50 ^a	1880.00 ^{ab}	56.42
Body weight gain (g/bird)	1747.00 ^{ab}	1796.50 ^{ab}	1879.00 ^c	1746.50 ^a	1838.00 ^{bc}	47.64
Average feed	4111.25 ^b	4133.25 ^b	4078.00 ^{ab}	3780.00 ^a	3891.00 ^a	155.31



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intake (g/bird)

FCR	2.30	2.25	2.13	2.11	2.07	0.08
Mortality (%)	5.00	6.00	4.00	4.00	0.00	0.45

a, b and c, Means along the same row with different superscript are significantly different ($p < 0.05$)

Table 3: Carcass characteristics of birds presented oral extracts of *Ocimum gratissimum* leaf

Treatments/ Parameters	T1	T2	T3	T4	T5	SEM
Average live weight (g)	1800.00	1850.00	1900.00	1830.00	1800.00	41.59
Slaughter weight (g)	1700.00	1750.00	1800.00	1750.00	1740.00	35.63
Defeathered weight (g)	1600.00 ^b	1650.00 ^b	1600.00 ^b	1450.00 ^a	1440.00 ^a	96.28
Dressed weight (g)	1500.00 ^c	1500.00 ^c	1450.00 ^b	1390.00 ^a	1310.00 ^a	80.93
Primal Cuts as % of Live weight						
Dressed %	83.33 ^c	81.08 ^c	76.31 ^b	75.95 ^{ab}	72.77 ^a	4.24
Drumstick Weight (g)	223.00 ^a	231.00 ^a	244.00 ^b	235.00 ^a	234.00 ^a	7.57
Drumstick %	12.38 ^a	12.48 ^b	12.84 ^b	12.84 ^b	13.00 ^b	0.26
Thigh %	22.11 ^a	23.56 ^b	23.31 ^b	23.49 ^b	23.50 ^b	0.61
Breast %	23.11 ^c	22.81 ^{bc}	22.68 ^b	21.31 ^a	21.75 ^a	0.76
Wing %	8.77 ^b	8.22 ^a	8.13 ^a	8.10 ^a	8.13 ^a	0.28
Back %	19.22 ^e	18.65 ^d	15.47 ^a	16.39 ^b	17.22 ^c	1.55
Head (g)	58.00	53.00	53.00	53.00	54.00	2.16
Leg (g)	91.00	90.00	88.00	83.00	84.00	3.56
Neck (g)	78.00 ^a	86.00 ^b	82.00 ^{ab}	75.00 ^a	80.00 ^{ab}	4.14

a, b and c, Means along the same row with different superscript are significantly different ($p < 0.05$)

The results of growth performance characteristics of broiler chicks administered *Ocimum gratissimum* leaf extract as presented in Table 2 showed that T3 and T5 (that is, birds that received 0.2ml and 0.6ml of the extracts) had numerically better final body weight and weekly weight gain than the birds that did not receive the extracts while there was no significant difference ($p > 0.05$) across the treatments on feed conversion ratio.

The results of this study's FCR are in contrast to those of Olobatoke and Oloniruha (2009), who found that using bitter leaf powder in cockerel diet increased FCR; however the birds with higher volumes of the extracts had much lower feed intake and higher end live weight and weight gains. This could be due to its ability to improve digestion and nutritional absorption by increasing the activity of the gastro intestinal enzyme (Adaramoye *et al.*, 2008).

Table 3 shows the effect of *Ocimum gratissimum* extract on carcass characteristics of broiler chickens. The result shows that there were no significant ($p > 0.05$) significant effects in the live weight, slaughtered weight, head, leg, and gizzard across the treatments. However, birds in the control had significantly higher ($p < 0.05$) dressing percentage, breast and back percentages. In the control group, the dressing percentage was much greater. This is also consistent with Nte *et al.* (2016), who found no significant effects on the cut portions of broiler chicks after administering Scent leaf (*Ocimum gratissimum*) extract. The dressing percentages found in this investigation are comparable to those reported by Nweze and Nwankwagu (2010) for broilers fed *Tetrapleura tetraaptera* containing diets. This could be due to the fact that different shrub leaf extracts were used.

Conclusion



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The use of *Ocimum gratissimum* leaf extracts administered orally in the production of broiler had no detrimental effect on the performance of broilers. However, *Ocimum gratissimum* leaf extracts administered up to 0.6ml enhanced the growth rate of the birds. *Ocimum gratissimum* leaf extracts can be administered to broiler chickens in place of antibiotic growth promoters used in feeding broilers because it has no negative effect on growth performance and carcass traits.

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