GROWTH PERFORMANCE AND CARCASS CHARACTERISTICS OF BROILER CHICKENS FED SCENT LEAF MEAL AS AN ALTERNATIVE TO ANTIBIOTIC GROWTH PROMOTER

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ABSTRACT
The potential of Ocimum gratissimum (scent leaf) meal (SLM) as an alternative to an antibiotic growth promoter was evaluated. It was incorporated into the formulated broiler diet at 0%,1%,2% and 3% levels respectively with a fifth treatment that contained 0.25% Oxytetracycline as positive control. These were designated as T1, T2, T3, T4 and T5 respectively. One hundred and twenty unsexed arbor acre broiler chicks were used for the experiment; they were allocated into the five treatments with three replicates each in a completely randomized design and fed for weeks. Results showed that SLM in T3 with 1% level of inclusion (750g/100kg of feed), had significant effects (P<0.05) on growth performance with weight gain at 48.5g/day higher than the 45.09g/day and 47.55g/day of the positive and negative controls respectively. Carcass weight of 1.87kg for T3 was also significantly higher those of the controls at1.61kg and 1.70kg. The use of this as an optima level was recommended for enhanced growth performance in broiler chicken production.
Keywords: Scent leaf meal, Antibiotic growth promoter, Carcass characteristics, Growth performance, Alternative.

INTRODUCTION

The use of sub-therapeutic doses of antibiotic growth promoters (AGPs) is a common method applied to maximize yield from intensively raised chickens. Their usage tend to increase animal growth efficiency by inhibiting the growth of microbes in the gut, thereby enhancing host immune response (Apata, 2012; Mehdi *et al.,* 2018), They have also been shown to reduce the microbial load in meat that can cause food borne diseases for man (Evangelista *et al.,*., 2021; Gadde *et al.,.,* 2017). However, scientific evidences have established that a prolonged use of AGPs is associated with an increasing problem of antimicrobial resistance (AMR), and this is coupled with the presence of their residues in food and the environment, thereby posing a great threat to human health.

Extensive research into natural alternatives with similar growth promoting abilities, such as maintenance of low mortality rate, good level of animal yield while preserving environmental and consumer health have been done (Jamil *et al.,*., 2022). There seems to have been an increasing preference for phytogenic feed additives (PFAs) such as *Ocimum gratissimum* (Scent leaf) in particular, because they are natural. Generally, their mode of actions is said to be due to the presence of essential oils in them and secondarily that of other compounds, PFAs seem to standout from others due to a broader scope of usefulness, beside their microbial effectiveness (Vlaicu *et al.,* 2022).

There are comprehensive reviews with descriptions of the some biological activities of scent leaf as an ethno medical additive. Ekwe *et al.,* (2017), Olumide and Akintola (2018), Odoemelam *et al.,* (2018), Salihu *et al.,* 2020, all reported the potentials of scent meal for enhancing growth performance in broiler chickens when compared with synthetic antibiotics. However there are gaps in the elucidation of its qualitative and quantitative compositions, further work on it is needed to adequately verify its adequacies in this regard, especially in this part of the world, where indiscriminate usage of AGPs seems still in practice.

This study was therefore focused on assessing the potency of graded levels of scent leaf meal as alternatives to a standard dosage of a synthetic antibiotic growth promoter (oxytetracycline).

MATERIALS AND METHODS

The experiment was carried out at the Poultry Section of the Teaching and Research Farm, Kwara State College of Education, Ilorin, Kwara State in the Guinea Savannah ecological zone of Nigeria, with an average day time temperature of 23 - 36°C relative humidity of 60 – 80% on latitude 8.6082°N and longitude 4.4723°E.

Source of Scent leaves

Fresh scent leaves were collected from Ilorin, Kwara state Nigeria, air dried and milled with a kitchen blender to produce the meal.

Bird Management and Experimental Design

One hundred and twenty unisex day old Abor acre broiler chicks were purchased from Yammfy Farm, Ilemona, Kwara State. They were grouped into five treatments with each having three replicates with eight chicks; in a completely randomized experimental design. A broiler starter diet was formulated, (Table 1), the scent leaf

meal was included at levels 0%, 1%, 2%,and 3%, the fifth had 0.25% oxytetracyclin as positive control. The chicks were fed for six weeks.

Data Collection

Feed intake (kg/bird/day) Feed was weighed daily and the leftovers were weighed. Feed consumed was calculated by subtracting the amount leftover from that given. The weekly average consumed was calculated for each treatment by dividing the total amount of feed consumed by the number of birds in each treatment.

Weight Gain

The birds were weighed in each treatment at the beginning of the trial and the weight recorded as initial weight. They were weighed subsequently weekly and the weight gains were obtained by subtracting the value of the body weight of one week from that of the previous one.

Feed Conversion Ratio

This was calculated by dividing feed intake by the weight gain.

Carcass Evaluation

Two birds were taken by random sampling from each treatment at the end of the 42 days trial and slaughtered by cervical dislocation, and the carcass weight was recorded after defeathering.

The organs for evaluation (liver, heart, and gizzard) were obtained after dressing the carcass weighed, and the weights were recorded.

Chemical Analysis

The phytochemical analyses were determined using the AOAC (2019) methods.

Statistical Analysis

Data collected were subjected to a One Way ANOVA. Means were separated using Duncan's Multiple Range test at ($P < 0.05$) level of significance.

RESULTS

The results of qualitative and quantitative phytochemical analyses indicate that it contains: flavonoids 12.5 mg/100g, saponins 5.6mg/100g, tannins 8.9mg/100g, glycosides 2.8mg/100g, 13.0mg/100g, 1.7mg/100g, 1.5mg/100, terpenoids 10mg/100g. The values are generally within the range of reference values of AOAC for assessing potency of phytochemicals. They agree with the report of Olobatoke and Okaragu (2021) that scent leaf is rich in tannins, flavonoids and saponins.

Table 1: Effect of SLM on growth performance of Broiler chickens

	Levels of SLM in diet %						
Parameters	0	1	2	3	0.25%OXT	SEM	P-value
Initial body weight	53.33^{a}	52.83^{ab}	52.83^{ab}	49.33^{b}	50.00^{ab}	0.44	0.001
Final body weight	2680^{a}	2430^{ab}	2390^{b}	2250^{b}	2440^{ab}	37.15	<0.0001
Weight gain (g/d)	47.55^{b}	48.50^{a}	38.97^{d}	31.57^{e}	45.09^{c}	1.70	0.002
Feed intake (g/d)	104.61^{a}	104,28^{a}	97,83^{c}	89.05^{d}	100.55^{b}	1.53	0.001
Feed conversion	2.20^{b}	2.15^{c}	2.51^{a}	2.82^{d}	2.23^{b}	0.07	<0.0001

Values in the row with the same letters do not differ significantly at ($P < 0.05$)

Table 2: Effect of dietary levels of SLM on Carcass Characteristics of broiler chickens

	Levels of SLM in diet %						
Parameters	0	1	2	3	0.25%OXT	SEM	P-value
Live weight (kg)	2.22^{c}	2.46^{a}	2.44^{b}	2.25^{c}	2.13^{d}	0.35	0.002
Carcass weight (kg)	1.70^{c}	1.89^{a}	1.87b	1.73^{c}	1.61^{d}	0.09	0.045
Thigh (%)^{a}	0.26	0.27	0.28	0.29	0.27	0.95	0.560
Breast (%)^{a}	0.59	0.60	0.69	0.72	0.68	0.10	0.246
Head (%)^{b}	3.11	3.31	3.59	3.59	4.22	0.10	0.234
Liver (%)^{b}	3.01^{b}	3.03^{a}	2.34^{c}	1.77^{d}	2.94^{c}	0.13	0.001
Gizzard (%)^{b}	1.79	2.1	2.22	2.16	2.84	0.09	0.766
Heart (%)^{b}	0.57	0.59	0.56	0.56	0.54	0.01	0.161

^{a} Percentage computed as a ratio of carcass weight; ^{b} Percentage computed as a ratio of live weight

Different superscripts on means within row indicate significant difference ($P < 0.05$).

DISCUSSION

Growth Performance of Broiler Chickens

Feed intake was significantly higher for birds on T3 (1% SLM) than those on the positive control and higher levels, they also showed best feed conversion ratio with a resultant superior performance in feed utilization. There was a decline in feed conversion efficiency with increasing level of SLM, however the final body weights were generally higher for birds on SLM, this is in agreement with the findings of Salihu *et al.,* (2020) that feed conversion ratio was better, final body weights were higher with better feed cost per gain for broilers fed with

scent leaf and oxytetracycline. Syed *et al* (2021) also reported improved ileal digestibility of crude protein which resulted in enhanced growth of broiler chickens that were fed Biomin DC-P a proprietary phytogenic feed additive.

Effect of Scent Leaf Meal on Carcass Characteristics

The liver and carcass weights were higher and similar for both the broiler chicks on the two controls and 1% SLM but significantly different from those on the other treatments. There was significant difference in the weight of the liver, weight of liver decreased with increased levels of inclusion of scent leaf; this is in congruence with the report of Ortiz (1994) who observed that histopathology of the liver of both chicks and rats showed hydropic degeneration of hepatocytes clearly more severe in the former than in the latter when fed diets containing tannin, and the gizzard and heart were not affected. The results of this study confirmed this as there were no significant differences for the weights of the other organs (gizzard, heart, head).The weights of the gizzard however increased in a dose dependent way, this according to Olumide and Akintola (2018) must have resulted from the enlargement of the organ due to the continuous need to grind the fibrous diet.

CONCLUSION

The results of this study show that scent leaf meal can be added to broiler chicken starter and finisher diets without adverse effects up to 1% inclusion level optimal performance.

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