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EFFECT OF NEGRO PEPPER (*Xylopia aethiopica*) AS A FEED ADDITIVE ON THE PERFORMANCE OF FINISHER BROILERS

Moses O[1*]: Efuruibe B.E[1]: Eze D.U[1]and Uzegbu H.O[2]

[1]Department of Animal Science and Fisheries, Abia State University, Umuahia Campus
[2]National Agricultural Extension and Research Laison Services Ahmadu Bello University Zaria Nigeria

*Corresponding author: 08160037414,oluomachiedozie@gmail.com

ABSTRACT

A feeding trial was conducted to evaluate the response of Finisher broiler chickens fed diets supplemented with Negro Pepper (*Xylopia aethiopica*) as natural feed additive. A total of 150 four weeks Ross broiler chickens were allotted randomly to five dietary treatments each replicated thrice, in a completely randomized design (CRD) with 10 chicks per replicate. *Xylopia aethiopica*was included at 0, 100g, 200g, 300g, 400g /100 Kg diet for T1-T5. Proximate analysis of *Xylopia aethiopica* and the experimental feed was carried out. Feed and water were given *ad-libitum* throughout the experimental period. All data collected for growth performance were subjected to analysis of variance and significant differences among treatment means were compared using the Duncan multiple test of significance. The results showed birds on the 300g *Xylopia aethiopica* had significantly ($P<0.05$) higher final weight (3033.20g), weight gain (1869.00g) and better feed conversion ratio (2.42) than other treatments. Feed intake was significantly ($P<0.05$) higher for the control than for birds on *Xylopia aethiopica*. It is concluded that *Xylopia aethiopica* significantly improved growth of broiler chickens, and gives better feed conversion ratio. *Xylopia aethiopica* can be used as a natural feed additive in Broiler Chicken Production.

Key words*: Xylopia aethiopica*, Growth Performance, Feed Additive, Finisher broilers

DESCRIPTION OF PROBLEM

The use of antibiotics as growth promoter intended not only as therapeutic but also as feed additive of continuous use in animal started appropriately five decades ago (1). Antibiotics have been also used to promote growth rate, improve feed conversion ratio (FCR) and reduce mortality in broiler chickens. Usually, Antibiotic Growth Promoters (AGPs) are administered at low doses, absorbed minimally from the gut and when incorporated into the feed, they act by specifically reducing the number of pathogenic bacteria (2). However, repeated use of antibiotics in poultry diets resulted in severe problems like resistance of pathogen to antibiotics, accumulation of antibiotics residue in their products and environment, imbalance of normal microflora and reduction in beneficial intestinal microflora (3). Due to these problems, in January 2006, the European Union (EU) placed a total ban on the use of feed antibiotics. This total ban on the use of antibiotics as growth promoters has been integrated into new EU regulation concerning feed additives (4).

Natural growth promoters such as herbs, roots and spices usually called phytogenics are recently used in poultry production due to their inherent bioactive compounds (5). These spices and herbs are known to improve food palatability through their aroma (6), improve digestion, and immune system response and possess antibacterial, antiviral, anti-inflammatory and antioxidant properties (7).

Xylopia aethiopica (Dunal) is commonly known as Selim pepper, Negro Pepper, or African pepper. It is locally referred to as Ata (Ibibio), Uda (Igbo), and Eeru (Yoruba), and may be used as a natural feed additive in poultry diets. *Xylopia aethiopica* has been reported to possess anti-microbial, anti-inflammatory, anti-oxidant and anti-bacterial characteristics. It contains phytochemical compounds such as tannin, saponins, phytate, oxalate and flavonoid (7). Despite much work done using *Xylopia*

aethiopica, there is still dearth of information on the appropriate inclusion levels for optimum growth and productivity of broiler birds, hence, the relevance of this study.

MATERIALS AND METHODS

Experimental Site

The experiment was conducted at the Poultry Unit of Abia State University Teaching and Research Farm, Umudike. Umudike is located on longitude 7°31¹ East and latitude 5°28¹ North, at an attitude of 122 meters above sea level.

Procurement and Processing of *Xylopia aethiopica*

Xylopia aethiopica fruit was procured from the local market (Ahia Eke, and OrieUgba) in Umuahia, Abia State. The fruits were washed and sundried for seven days. The dried samples will be ground into powder using a manual blender (Corona 1016, Landersy Y CIA) to produce *X. aethiopica* fruit powder which was packaged and stored in cellophane bags under room temperature till usage

Experimental Design and management of birds

One hundred and fifty (150) four weeks Ross broiler chickens were allocated to five (5) dietary treatments, each replicated three times with 10 chickens per replicate each in a completely randomized design (CRD). The birds were housed in deep litter pens and managed with all necessary routine management practices and routine vaccinations

Experimental diets

Five diets were formulated for the feeding trial to meet standard requirements of broiler chickens. *Xylopia aethiopica* were added as non-inclusive part of the diets.

Five diets were formulated as shown below.

Diet 1: 0 g of *Xylopia aethiopica* (Control)

Diet 2: 100g of *Xylopia aethiopica* /100 Kg diet

Diet 3: 200g of *Xylopia aethiopica*)/100 Kg diet

Diet 4: 300g of *Xylopia aethiopica* /100 Kg diet

Diet 5: 400g of *Xylopia aethiopica* /100 Kg diet

Growth performance

Initial and final weights of birds were taken at the beginning and at the end of the experiment. Feed intake was measured weekly while, weight gain feed/gain were computed

Data Analysis

All data obtained from the study was statistically analysed using the General Linear Model Procedure of Statistical Analysis Systems and Significant difference between treatments means were separated using Duncan's Multiple Range Test (DMRT).

Table 1: Proximate Analysis of *Xylopia aethiopica*and experimental diet

Parameters (%)	*Xylopia aethiopica*	Experimental diet
Crude protein	7.83	22.71
Ether extract	9.07	4,5
Crude fibre	15.23	4.76
Ash	5.02	7.41
Nitrogen free extract	56.52	60.57

RESULTS AND DISCUSSION

Table 2 shows the performance characteristics of broiler chickens fed different levels of *Xylopia aethiopica* as a feed additive. There were significant ($P<0.05$) differences in final weight, average daily weight gain, total weight gain, feed intake, daily feed intake and feed conversion ratio. Birds on the 300g *Xylopia aethiopica* had significantly ($P<0.05$) high final weight, total weight gain and better feed conversion ratio than other treatments. Feed consumption was significantly higher for the control than for birds on *Xylopia aethiopica*.

The observed results for the growth performance shows that birds on 300g of *Xylopia aethiopica* showed superior performance when compared with other treatments. This shows that *Xylopia aethiopica*has growth promoting activities. The results are in agreement with the findings of Al-Kasie *et al*. (8) who reported that negro pepper improve growth and feed intake of broiler

chickens. Obodo(9) establish that *Xylopia aethiopica*can influence body weight gain and growth performance. In contrast however, (10) reported that the essential oils contained in Negro pepper reduced growth of boilers at higher level of inclusion. The result for feed intake shows that *Xylopia aethiopica* has effect on feed consumption. (11) reported that natural feed additives such as herbs, spices and probiotics are known to positively affect feed intake at certain levels and also improve their health status. However, (7) recorded no significant difference between the treatment groups when *Xylopia aethiopica* was use as feed additives.

Feed conversion ratio show significant difference (P<0.05) with 400g*Xylopiaa ethiopica* inclusion having best value (2.42) and the control group having the worst (2.88). This shows that the broiler chickens consumed smaller quantity of feed to gain one kilogram compared to the control. The health of the birds were not compromised during the course of the research as this might have direct influence on the growth of the animal as no mortality was recorded during the course of the experiment

Table 2: Effect of *Xylopia aetiopica* on the growth performance of broiler chickens

	Levels of *Xylopia aetiopica*					
Parameters	**Control**	**100g**	**200g**	**300g**	**400g**	**SEM**
Initial weight (g/b)	1142.67	1143.00	1142.67	1143.00	1142.67	0.25
Final weight (g/b)	2823.83^{b}	2871.43^{b}	2697.60^{c}	3033.20^{a}	2847.60^{b}	36.57
Weight gain (g/b)	1681.00^{b}	1728.67^{b}	1555.00^{c}	1869.00^{a}	1705.00^{b}	35.74
Average daily weight gain	80.00^{b}	82.67^{b}	74.00^{c}	89.00^{a}	81.00^{b}	1.66
Feed intake (g/b)	4839.33^{a}	4704.67^{ab}	4183.67^{c}	4504.67^{b}	4471.33^{b}	141.52
Average daily feed intake	230.33^{a}	223.67^{ab}	199.33^{c}	214.67^{b}	212.67^{b}	6.70
Feed conversion ratio	2.88^{c}	2.72^{b}	2.69^{b}	2.42^{a}	2.64^{b}	0.06
Mortality (%)	0.00	0.00	0.00	0.00	0.00	0.00

a,b,,: Means with different superscripts on the same row are significantly different (P<0.05) SEM= Standard error of mean.

Conclusion and Application

From the results obtained, *Xylopia aethiopica*a natural feed additive can be used in broiler chicken production because it improved the weight gain and feed conversion efficiency. It had no adverse effect on the birds as no mortality was recorded during the experiment. Poultry farmers can use *Xylopia aethiopica* at 300g per 100 Kg feed for finisher Broilers.

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