ATILI LEAF MEAL AS SUPPLIMENTS IN DIETS OF BROILER CHICKENS PRODUCTION

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ABSTRACT

The study was carried out to investigate the use of Atili leaf meal in the diets of broiler chickens. The research duration was six weeks in a completely randomised design. The experimental diets contain 0.00% of Atili leaf meal T1, 2.00% of atili leaf meal T2, 4.00% of atili leaf meal T3, 6.00% T4, and 8.00% of atili leaf meal T5 respectively. The parameters measured include the initial weight, final weight, weight gain, feed intake (growth performance) and the Feed conversion ratio was calculated, the cost of production was also evaluated. The results obtained showed that the control treatment had the highest final weight 2786.67(g) while the treatment with 2.00% atili leaf meal had the lowest final weight of 2273.33(g). The weight gained was also observed to be high in the control with 0.00% atili leaf meal and lowest in treatment 2. The Feed conversion ratio (FCR)was high in treatments 2 and treatment 5 while T1 had the lowest FCR. The cost of production was observed to be highest in T1 compared to other treatments. But T1 was observed to have the highest mortality while T2 to T5 had no mortality all through the period of the experiment. It can be concluded that Atili leaf meal can be used in the diets of broiler chickens both for nutrients and prophylactics at a reduce cost of production.

Keyword: *Canarium schweinfurthii,* growth performance, cost of production, leaf meal

INTRODUCTION

Broiler production is quick and can solve the problem of protein deficiency in human diets but the major problem with its mass production recently is availability of feed. The cost of producing feed is on the increase due to the shortage of feed ingredients and this is partly caused by the insecurity of life on the farm land and also Farmer-Herder clash which is a monster ravaging food production in the Country. This have compelled researchers to direct their attention to alternative means of supplementing the various ingredients not available or shortage of nutrients. The use of leguminous trees and shrubs has been suggested to be a viable alternative source of proteins, vitamins and minerals for poultry feeding. Broiler is a young chicken, usually 6-8 weeks of age, of either sexes, with tender meat, soft, palatable, smooth textured skin and flexible breastbone cartilage. Broiler production is currently oriented for parts marketing, and no longer to whole carcasses, which led to the development of birds with higher lean tissue yield and lower fat content (Buteri, 2003). Nworgu (2007) observed that plant leaves are commonly processed into leaf meals for use as poultry feed. Examples of the leaf meals which have been widely used in feeding non-ruminant animals include *Leucaena leucocephala, Gliricidia sepium, Sesbania sesban* and *Manihot esculenta* (Gadzirayi *et al*., 2012). *Canarium schweinfurthii* is one of those plants usually used by indigenous people for its nutritional value; it belongs to the family Burseraceae. A perennial plant found in Africa referred to as black olive, African olive, black elemi (Adelowo et al., 2019). *Canarium schweinfurthiii* (Atili) trees are rich in phenolic substances having significant biological properties, the most important of which is oleuropein. Oleuropein is the heterosidic ester of elenolic acid and hydroxytyrosol (Mujić *et al.*, 2011). The most important natural source of this compound is the Atili leaf (Govaris *et al.,* 2010). Studies on *Canarium schweinfurthiii* (Atili) leaf demonstrated that it includes some medical compounds having antihypertensive, antiatherogenic, cardioprotective, hypocholesterolemic, hypoglycemic, antimicrobial, antiviral, antitumor, anti-inflammatory and antioxidant properties

(Mujić *et al.*, 2010; Bahsi *et al.*, 2016).This study evaluate the effect of inclusion of atili (*Canarium schweinfurthii)* leaf meal in the diets of broiler chickens on their performance.

MATERIALS AND METHODS

One hundred and fifty unsexed broiler chicks was purchased from a reputable farm, vaccine was given to the birds according to the management practice, the chicks were divided into 5 treatments of 30 birds each In a completely randomized design (CRD). Each treatment was further divide into 3 replicates of 10 birds with T1 control of 0%, T2 with 2%, T3 4%, T4 6% and T5 with 8% inclusion of atili leaf meal. The duration of the study was six (6) weeks.

The parameters measured include the initial weight, weight gain, feed intake, final weight and the feed conversion ratio and cost of production was calculated. Feed was given daily across the Treatments and left over was measured daily to calculate the feed intake per day. Water was given *adlibitum.* The diets was formulated to meet the nutrition requirements of poultry and shown in Table 1 and 2. Data obtained were subjection to analysis of variance using the SPSS software package and means were also separated using Duncan multiple range test of the same software.

Table 1: Composition of experimental diets for Broiler Starter

INGREDIENTS	0.00%	2.00%	4.00%	6.00%	8.00%
Maize	50.00	50.00	50.00	48.00	48.00
Wheat Ofals	9.10	8.10	6.10	6.10	5.10
Soyabean meal	18.00	17.00	17.00	17.00	17.00
Groundnut Cake	18.00	18.00	18.00	18.00	17.00
Fish meal	1.00	1.00	1.00	1.00	1.00
Atili Leaf meal	0.00	2.00	4.00	6.00	8.00
Bone meal	3.00	3.00	3.00	3.00	3.00
*Broiler Premix	0.25	0.25	0.25	0.25	0.25
Methionine	0.20	0.20	0.20	0.20	0.20
Lysine	0.20	0.20	0.20	0.20	0.20
Salt	0.25	0.25	0.25	0.25	0.25
Total	100.00	100.00	100.00	100.00	100.00
CALCULATED NUTRIENT					
Energy (Kcal/kg)	2863.57	2837.87	2820.47	2772.77	2747.27
Crude protein (%)	22.48	22.23	22.22	22.37	22.10
Calcium (%)	1.27	1.26	1.26	1.26	1.26
Available Phosphorus %	0.76	0.74	0.72	0.71	0.70
Lysine (%)	1.21	1.18	1.16	1.16	1.14
Methionine (%)	0.52	0.52	0.52	0.52	0.51
Fibre (%)	3.85	3.70	3.53	3.47	3.36

Table 2: Composition of Experimental Diets for Broiler Finisher

INGREDIENTS	0.00%	2.00%	4.00%	6.00%	8.00%
Maize	47.00	47.00	45.00	45.00	45.00
Wheat ofals	15.05	17.05	18.05	16.05	14.05
Soyabean meal	17.00	15.00	14.00	14.00	14.00
Groundnut cake	17.00	15.00	15.00	15.00	15.00
Limestone	1.00	1.00	1.00	1.00	1.00
Atili Leaf Meal	0.00	2.00	4.00	6.00	8.00
Bone meal	2.00	2.00	2.00	2.00	2.00
Finisher premix	0.25	0.25	0.25	0.25	0.25
Methionine	0.20	0.20	0.20	0.20	0.20
Lysine	0.25	0.25	0.25	0.25	0.25
Salt	0.30	0.30	0.30	0.30	0.30
Total	100.00	100.00	100.00	100.00	100.00
Energy (Kcal/kg)	2788.94	2739.34	2683.04	2665.64	2648.24
Crude protein (%)	21.64	20.60	20.60	20.49	20.49
Calcium (%)	1.19	1.18	1.19	1.18	1.18
Available Phosphorus %	0.64	0.65	0.65	0.64	0.61
Lysine (%)	1.15	1.07	1.07	1.03	1.02
Methionine (%)	0.51	0.49	0.49	0.48	0.48
Fibre (%)	4.17	4.11	4.09	3.92	3.75

Phytochemical properties of atili leaf

Phytochemical(s)	Result
Tannins	++
Phlobatannins	-
Flavonoids	+++
Phenols	+
Carbohydrate	+++
Steroids	+
Anthraquinones	-
Alkaloids	+++
Saponins	+++

AOAC (2000)

RESULTS AND DISCUSSIONS

Table 3: Growth performance of broiler chickens fed diets containing graded levels of Atili leaf meal

	Level of *Canarium schweinfurthii* (%)					
Parameter	0.0	2.0	4.0	6.0	8.0	SEM
Av initial weight (g)	218.00	218.00	218.33	218.00	218.00	0.03
Av final weight (g)	2786.67^{a}	2273.33^{b}	2423.33 ^{b}	2386.67^{b}	2320.00^{b}	61.12
Av Daily feed intake	125.40	132.74	128.10	123.41	132.38	1.62
Av. Daily weight gain	61.25^{a}	48.94^{b}	52.56^{b}	51.25^{b}	50.14^{b}	1.86
FC R	2.06^{b}	2.72^{a}	2.43^{ab}	2.43^{ab}	2.64^{a}	1.47

AV: Average, SEM: Standard error means, FCR: Feed conversion ratio

From the results in Table 3, it was observed that the birds in the control diets gain more weight compared to the other treatments with the atili leaf meal but the control were not active and had more mortality compared with treatments with the test ingredients. Atili leaf meal can serve as prophylactics for the birds and this will help to boost immunity in the bird and prevent the outbreak of diseases according to Mujić *et al.,* (2011) *Canarium schweinfurthiii* (Atili) trees are rich in phenolic substances having significant biological properties, the most important of which is oleuropein. Oleuropein is the heterosidic ester of elenolic acid and hydroxytyrosol (Mujić *et al.,* 2011). The leaves of this plant is the most natural source of this compound as revealed by the report of Govaris *et al.,* (2010) all of which help the broiler chickens to build immunity against any infection. Studies on *Canarium schweinfurthiii* (Atili) leaf also demonstrated that it has some medical compounds having antihypertensive, antiatherogenic, cardioprotective, hypocholesterolemic, hypoglycemic, antimicrobial, antiviral, antitumor, anti-inflammatory and antioxidant properties (Mujić *et al.,* 2010; Bahsi *et al.,* 2016).

The cost of production is high in the control pen of the experiment when compared with other treatments, these can encourage the farmers in the rural areas where the trees are grown to include the leaves in the diets of the broiler chickens.

Table 4: Price implication per 1kg for each treatment and ingredient

	T1	T2	T3	T4	T5
Cost of production	33732	33027.5	32917.5	32917.5	33102.5

Recommendation

Since Atili leaf are considered waste and are mostly discarded, making feed with Atili leaf will reduce the cost of feeding birds, and for medicinal purpose because birds fed with Atili leaf meal were more active. Therefore, farmers should include Atili leaf meal in the diets of broiler chickens

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