PERFORMANCE OF FINISHER BROILER CHICKENS FED VARYING LEVELS OF CASHEW *(Anacardium occidentale*) LEAF MEAL

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ABSTRACT

The low nutrient utilization which is combatant to soaring cost of raising poultry has made the animal nutritionist to explore avenues to use natural feed additives to maximize the utilization of nutrients in the available feed ingredients for cost reduction. A study was therefore undertaken to evaluate the proximate composition of cashew Anarcadium occidentale leaf meal (CLM) and the effect of it's dietary inclusion on performance of finisher broiler chickens. One hundred and twenty Anak-2000 breed of finisher broilers were distributed randomly in a completely randomized design (CRD) of four treatments replicated three times. The experimental diets consist of CLM added at levels of 0%, 1.5%, 2.5% and 3.5% in treatment 1 (control), 2, 3 and 4 respectively. The diets were fed for 28 days, during which feed intake and weight gain were monitored. The result of the proximate composition showed that CLM contained 14.53% crude protein among other nutrients while the result of performance showed that treatment 4 had significant (P<0.05) highest weight gain and feed intake while treatments 2 and 3 were similar (P>0.05) with the control. It was concluded that inclusion of CLM at 3.5% had the potential to impact positively on performance of finisher broiler chickens and therefore could be included in the formulation of finisher broilers diets at up to 3.5%.

Keywords: Cashew leaf meal, Diet, Performance, Proximate composition

INTRODUCTION

The gloomy condition of animal protein intake in Nigeria has necessitated for concerted actions into explorations for transformation of animal agriculture. Nigeria remains a very low protein intake country with per capita consumption levels as low as 8.7 litres of milk, 9 kg of meat and 45 eggs per year compared to global averages of 44 litres of milk, 19 kg of meat and 180 eggs (NIAS, 2024). Poultry is the meat most consumed worldwide (Connolly et al., 2022) with Nigeria consuming around 400,000 metric tonnes annually (Kareem, 2024). The class of poultry that supply meat is the broiler (Kpomasse et al., 2021). Feed has been a major cost in modern broiler production, accounting for 65-75% of the total production cost in an intensive system (Aderemi, 2020). The present high cost of feed ingredient has therefore led to high production cost and decrease in the profit margin of broiler industry with the resultant decrease in production, high cost of the meat and low accessibility of the meat the citizenry. Attempts have recently been taken to reduce the cost of feed, including the incorporation of agro-industrial by-products in broiler diets (Sugiharto, 2019). Majority of these feed ingredients though high in nutrient but their nutrient availability is low. The low nutrient availability further compounds the high feeding cost as in most cases birds do nut optimally utilize the nutrients that abound in these feed ingredients. Several approaches are presently being adopted to improve digestibility and nutrient availability to the birds, among which is the use of feed additive such as probiotics, prebiotics, enzymes, amino acids, vitamins and naturally occurring additives extracts from leaves (Murwani, 2008). Different leave types have different levels of component (Sebola et al., 2019). Genetic make-up, environmental factors and degree of maturity also determine the types and levels of the bioactive compounds in plant leaves (Sebola et al., 2019). One of the leaves of interest is Cashew (*Anacardium occidentale L.).* T

he plant is abundant in Nigeria and has been reported to possess ideal pharmacological properties (Jinah et al., 2020). Cashew leaf meal has a dry matter content of 93.49% with crude protein content of 14.65% Crude fat content of 10.81% Crude fibre content of 16.95%, Ash content of 3.70% and Nitrogen free extract content of 49.58% (Oloruntola, 2021). The present research therefore explored the proximate composition of cashew leaf meal and, the effect of it's of dietary inclusion on the performance of finisher broiler chickens.

MATERIALS AND METHODS

The research was conducted at the Teaching and Research Farm, Department of Animal Health and Production Technology, Akanu Ibiam Federal Polytechnic, Unwana, Afikpo, Ebonyi State. Unwana is in the tropical rain forest zone of Nigeria.

Collection and preparation of the cashew leaf

Mature and greenish cashew leaves were harvested from cashew tree located within the farm premises. The leaves were air dried under room temperature till they were crispy and malleable, milled in a hammer mill to obtain the cashew leaf meal (CLM), sample of which was analysed for chemical composition according to AOAC (2000) and then used to formulate the experimental diets.

Experimental Birds and Design

The total of 120 Anak 2000 breed of finisher broiler of 28 days post hatch with average weight of 1237.5g were used for the research. The broilers were randomly assigned to four (4) treatment group in a completely randomized design (CRD) replicated 3 times. The groups were T_1 which was the control group, T_2, T_3 and T_4. The groups were assigned to an experimental unit of 1m by 1m each and raised in a deep liter system. Feed and water were given *ad-libitum* and proper bio-security measures strictly followed. The feeding trial lasted for 28 days.

Experimental Diets, data collection and analyses

Four experimental diets were formulated for this research. Diet T_1 was the control which contained 0% CLM, in diets T_2, T_3 and T_4, CLM partly replaced Soybean meal and was added at 1.5%, 2.5% and 3.5% inclusion rates respectively. The percentage ingredient and the calculated nutrient composition of the experimental diets are shown in the Table 1.

Table.1 Ingredients and Calculated Nutrient Composition of the Experimental Diets

Ingredients	Dietary levels (%)			
	T_1 (0CLM)	**T_2(1.5 CLM)**	**T_3 (2.5CLM)**	**T_4 (3.5 CLM)**
Maize (yellow 9% CP)	54.00	54.00	54.00	54.00
Cashew leaf meal (14.53%CP)	0.00	1.50	2.50	3.50
Full fat SBM (38% CP)	15.00	13.50	12.50	11.50
Groundnut cake (45% CP)	12.00	12.00	12.00	12.00
Palm kernel cake (18%)	10.00	10.00	10.00	10.00
Fish meal (65%)	4.00	4.00	4.00	4.00
Lime stones	1.00	1.00	1.00	1.00
Bone meal	3.00	3.00	3.00	3.00
L-lysine	0.25	0.25	0.25	0.25
Di methionine	0.25	0.25	0.25	0.25
**Vitamin & Min premix	0.25	0.25	0.25	0.25
Common salt	0.25	0.25	0.25	0.25
Total	**100**	**100**	**100**	**100**
Calculated nutrient composition of the diets				
Crude Protein (%)	20.36	20.01	19.77	19.54
Crude fibre (%)	4.06	4.01	3.97	3.94
Calcium (%)	1.70	1.69	1.69	1.69
Crude fat (%)	4.80	4.81	4.83	4.83
*Metabolizable energy (kcal/kg)	3093.26	3084.99	3079.48	3073.97

**To provide the following per kilogram of feed; vit A 10,000IU; vit. D3 1,500 IU; vit. E 2 mg; riboflavin 3 mg; pantothenic acid 10 mg; actinic acid, 2.5 mg; choline 3.5 mg; folic acid 1 mg; magnesium 56 mg; lysine 1 mg; iron 20 mg; zinc 50 mg; cobalt 1.25 mg. * *M.E* of *Cashew leaf meal was calculated according to* (Paunzega, 2007) ME = *35 × % CP + 81.8 × % E.E + 35.5 × % NFE, where, M.E = metabolizable energy, CP = crude protein, EE = ether extract, NFE = nitrogen free extract.*

Data were collected by re-weighing the birds to obtain their final body weight and daily weight gain. Feed intake was obtained by deducting the leftover feed from the quantity of feed given. Feed conversion ratio (FCR) was calculated by dividing feed intake with mean weight gain. Data obtained were subjected to analysis of variance (ANOVA). Treatment means were compared using Duncan Multiple Range test at an α-level of 0.05% significant level.

RESULTS AND DISCUSSION

The result of the proximate composition of the CLM as presented in Table 2 showed values in line with values reported by Oloruntola (2021). The value obtained for crude protein in the present research however, was higher than the 10.28% reported by Martinez et al. (2021). The difference could be as a result of assertion of Sebola et al. (2019) that genetic, environmental factors and degree of maturity determine the levels of the compounds in plant leaf.

Table 2: Proximate composition of Cashew Leaf Meal

Nutrients	Composition (%DM)
Moisture Content	7.40
Crude protein	14.53
Fat	4.62
Ash	3.77
Crude fibre	13.06
Carbohydrate	56.48

Source: Field report of Ikpe et al., 2023, Dm = dry matter

The result of the performance of the finisher broiler chickens fed graded levels of the cashew leaf meal as presented in Table 3. showed that the broilers in T_4 group had significantly ($P< 0.05$) highest final weight of 2776.60 grams while the broilers in T_3 (2440.00g) and T_2 (2480.00g) were similar ($P>0.05$) with the control (2488.30). The feed intake was highest in T_4. The FCR of T_3 differed significantly ($P<0.05$) from that of T_4. The results obtained from the present research affirms to the assertion of Martinez et al. (2021) who in their work ascertained that the dietary use of cashew leaves powder up to 1.5%, increased body weight. This present research however, further showed that at a higher inclusion rate of 3.50%, the finisher broilers also performed well. The higher crude protein in the CLM used for the present research as compared to the crude protein of CLM used by Martinez et al. (2021) could have contributed to the improved performance of the broilers at this higher inclusion rate.

Table 3: Performance of finisher broilers fed graded levels of cashew leaf meal

Parameters	**Treatment levels (%)**				**SEM**
	T_1(0.00CLM)	**T_2(1.50CLM)**	**T_3(2.50CLM)**	**T_4(3.50CLM)**	
Av. Initial wt. (g)	1493.30	1500.00	1466.70	1526.70	0.05
Av. Final wt. (g)	2433.30^{b}	2480.00^{b}	2440.00^{b}	2776.70^{a}	0.08
Av. Body wt. Gain (g)	940.00^{b}	980.00^{b}	973.00^{b}	1250.00^{a}	0.07
Av. Daily wt. Gain (g)	67.14^{b}	70.00^{b}	69.53^{b}	89.29^{a}	4.69
Av. Total feed intake (g)	2240.00^{c}	2310.00^{bc}	2500.33^{ab}	2630.00^{a}	86.18
Av. Daily feed intake (g)	160.00^{c}	165.00^{bc}	178.67^{ab}	187.86^{a}	6.16
Feed Conversion Ratio	2.38^{ab}	2.36^{ab}	2.62^{a}	2.10^{b}	0.20
Mortality (no)	0	0	0	0	

Note: *Without superscript = not significant, means on the same row with different super script differ significantly ($P<0.05$). SEM = Standard error means. Av. = Average, wt. = weight, no = number*

CONCLUSION

It was concluded that CLM has relative quantity of nutrients and can be included in broiler finisher diet at up to 3.50 inclusion rate. It is therefore recommended for inclusion in finisher broiler chicken diets.

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