



PERFORMANCE AND ORGAN WEIGHT OF BROILER CHICKENS FED GRADED LEVELS OF MIXTURE OF *OCIMUM GRATISSIMUM* AND *VERNONIAAMYGDALINA* LEAF MEAL-BASED DIETS

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Abstract: Performance and organ weight of 150 broiler chickens of Abor Acre strain were investigated in a feeding experiment in a completely randomized design that lasted for eight weeks at the Teaching and Research Farm of Department of Agricultural Education, Federal College of Education (Technical) Akoka, Lagos Nigeria. The birds were randomly allotted to five dietary treatment groups, control groups (birds fed basal diet only) and 4 treatment groups (birds fed D1, D2, D3 and D4 containing 25g, 50g, 75g and 100g mixtures of *Ocimum gratissimum* and *Vernonia amygdalina* leaf meal respectively in 25kg basal diet) in a completely randomized design with three replicates per group containing 10 birds per replicate. The study showed that mixture of *Ocimum gratissimum* and *Vernonia amygdalina* leaf meal in equal proportion did not significantly increased daily feed consumption and improved efficiency of broiler chickens at finisher stage. However, the percentage weight of gizzard and abdominal fat was significantly ($p < 0.05$) increased while the heart and length of intestine were significantly ($p < 0.05$) reduced.

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Introduction

The use of herbal materials, medicants and growth promoters is gaining a wide-world acceptance in livestock production. The search for and use of herbal materials that offer growth nutrients and therapy against disease organisms is a challenge to livestock production. Green vegetables are cheap source of protein in broiler diets because of the ability to synthesize amino acids from carbon dioxide and atmospheric nitrogen [1,2]. The leaves of *Ocimum gratissimum* and *Vernonia amygdalina* contain appreciable amount of feed nutrients, particularly mineral and vitamins capable of use as vitamin-mineral premix in broiler nutrition [2, 3]. The chemical compositions of *Ocimum gratissimum* and *Veronia amygdalina* as documented by [2] and [3] are presented in Table 1. The leaves of the two vegetable plants contain bioactive phytochemical components which have physiologic response of enhancing efficient digestion, the chemical composition of synergistic interaction in animals [4]. It in light of the above that the present study was carried out to investigate effect of graded levels (25g, 50g, 75g and 100g) of mixtures of *Ocimum gratissimum* and *Veronia amygdalina* leaf

meal in 25kg basal diet on the performance, haematology and organ yield of broiler chickens.

Materials and Methods

This study was carried out at Teaching and Research Farm, Department of Agricultural Education and Federal College of Education (Technical) Akoka-Yaba, Lagos, Nigeria. The test materials, scent leaf (*Ocimum gratissimum*) and bitter leaf (*Vernonia amygdalina*), were purchased from the open markets in Lagos metropolis, rinsed using distilled water, sun dried for 5 days and blended using an electric Mortar and Pestle Miller (Model MR 200 Pascall) into leaf meal. The meals were packed inside transparent polythene bags and added to broiler finisher diets at ratio 1:1 of scent and bitter leaf meal. 150 broiler chicks of *Abor acre* strain, purchased from a reputable hatchery in Ibadan, Oyo state, Nigeria, was brooded together for four weeks in an open-sided deep litter house previously cleaned, disinfected, fumigated and covered with wood shavings to 5m depth. At week 4, the birds were randomly allotted to five dietary treatment groups; control groups (birds fed basal diet only) and 4 treatment groups (birds fed D1, D2, D3 and D4 containing 25g, 50g, 75g and 100g mixtures of

Ocimum gratissimum and *Vernonia amygdalina* leaf meal respectively in 25kg basal diet in a completely randomized design trials with three replicates per treatment group containing 10 birds per replicate. The gross compositions of the starter and finisher basal diets are shown in Table 2. Recommended vaccination and medication schedules from the hatchery were strictly observed. A starter diet was fed for 4weeks (0-4weeks) and finisher 4weeks (5-8weeks). Experimental diets and water were provided ad-libitum throughout the 28 days of the study. Body weight changes and feed intake were measured on weekly basis to determine body weight gain and feed conversion ratio. At week 8, 3 birds per replicate were randomly sampled for organ yield. The birds were starved of water and feed for 16hrs before slaughtered. They were scalded manually and de-feathered to obtain the dressed weight. The internal organs were carefully dissected for gizzard, heart, liver, abdominal fat and intestine, and weight expressed to percentages live weight. Data were subjected to analysis of variance to test significance at $p=0.05$. Significant means were separated using Duncan Multiple Range Test by the procedure of [5]

Results and Discussion

The initial and final body weight, weigh gain, feed intake and feed conversion ratio of broiler chickens are shown in Table 3. Performance indices broiler chickens apparently increased, except FCR, as the graded levels of mixture *Ocimum gratissimum* and *Vernonia amygdalina* leaf meal increased; however, the parameters were not significantly ($p>0.05$) influenced by dietary treatment. The non-significant increase in feed intake and consequently, the daily weight gain and

final body weight could be to the appreciable amount of feed nutrients in the mixture of *Ocimum gratissimum* and *Vernonia amygdalina* leaf meal, particularly mineral and vitamins as observed by [2] and [3] and bioactive phytochemical components which have physiologic response of enhancing efficient digestion, absorption and feed utilisation; and therapeutic benefit of secondary metabolites with different synergistic interaction in animals[4]. The increase in overall feed efficiency over the 28 days feeding trial suggest the ability of mixture *Ocimum gratissimum* and *Vernonia amygdalina* leaf meal to improve nutrient metabolism

The organ yield of broiler chickens fed graded levels of mixture of *Ocimum gratissimum* and *Vernonia amygdalina* leaf meal based diets is as shown in Table 4. The live weight of broiler chickens fed control and 75g leaf mixture/25kg basal diet were similar and significantly ($p < 0.05$) higher than those fed 25g, 50g and 100g leaf mixture/25kg basal diets. The live weight of broiler chickens fed 75g leaf mixture/25kg basal diet was also similar but significantly higher ($p < 0.05$) than those fed 25g leaf mixture/25kg basal diet. Dietary graded levels of mixture of *Ocimum gratissimum* and *Vernonia amygdalina* leaf meal based diets did not follow a definite trend on the live weight of broiler chickens. The percentage dressed weight of broiler chickens increased non-significantly ($p > 0.05$) with graded levels of mixture of *Ocimum gratissimum* and *Vernonia amygdalina* leaf meal in the based diets. Dietary graded levels of mixture of *Ocimum gratissimum* and *Vernonia amygdalina* leaf meal significantly ($p < 0.05$) decreased the percentage weight of heart of broiler chickens.

Table 1: chemical composition of *Ocimum gratissimum* and *Vernonia amygdalina* leaf meal

Parameters	<i>Ocimum gratissimum</i>		<i>Vernonia amygdalina</i>
	(a)	(b)	(a)
Moisture content (%)	8.51	13.48	5.36
Dry matter (%)	91.49	86.52	94.64
Crude protein (%)	21.98	16.28	29.20
Crude fibre (%)	11.66	17.21	8.26
Ether extract (%)	3.50	4.57	3.43
Ash (%)	14.80	12.26	16.67
Nitrogen free extract (%)	39.55	36.20	37.08
Gross energy (kcal. 100gDM)	363.38	379.50	380.39
A (mg/100g)	2.96	-	6.50
E (mg/100g)	1.62	-	1.75
K (mg/100g)	1.72	-	2.35
B1 (mg/100g)	4.04	-	5.78
B2 (mg/100g)	3.32	-	3.94
B3 (mg/100g)	3.14	-	6.51
B5 (mg/100g)	3.56	-	5.72

B9 (mg/100g)	3.19	-	8.73
C (mg/100g)	87.21	-	150.48
Phytate (mg/100g)	7.41	-	9.88
Phytin-P (mg/100g)	2.09	-	2.78
Oxalate (mg/100g)	1.31	-	1.62
Tannin (mg/100g)	0.06	-	0.04
Alkaloid (mg/100g)	-	0.86	-
Saponin (%)	-	0.62	-
Phenol (%)	-	0.19	-
Glycoside (%)	-	0.10	-
Methionine (%)	-	0.85	-
Lysine (%)	-	1.13	-
Alanine (%)	-	0.97	-
Cysteine (%)	-	0.27	-
Tryptophan	0.62	-	-
Calcium (mg/100g)	-	0.52	-
Phosphorus (mg/100g)	0.34	-	-
Sodium (mg/100g)	-	0.76	-
Potassium (mg/100g)	-	1.34	-
Manganese (mg/100g)	31.30	-	-
Copper (mg/100g)	-	13.70	-
Iron (mg/100g)	71.30	-	-
Zinc (mg/100g)	27.50	-	-
Lead (mg/kg)	-	1.70	-
Cadmium (mg/kg)	-	0.05	-
Chromium (mg/kg)	-	1.55	-
Nickel (mg/kg)	-	0.86	-

Sources: (2,3)

Table 2: Gross Compositions (%) of Starter and Finisher Diets

Ingredient	Starter diet	Ingredients	Finisher diet
Maize	46.00	Maize	50.00
Full fat suya	27.00	Indomie	10.00
Groundnut cake	10.00	Soya bean meal	21.00
Fish meal	3.00	Groundnut cake	10.00
Whaet offal	9.00	Brewers dry grain	4.50
Broiler starter premix	0.25	Di-Calcium phosphate	1.70
Limestone	1.50	Limestone	1.50
Di-calcium phosphate	2.50	Methionine	0.25
Lysine	0.25	Lysine	0.25
Methionine	0.25	Broiler finisher premix	1.30
NaCl	0.25	NaCl	0.25
Total	100.00		100.00
Calculated nutrients			
Energy (Kcal/Kg ME)	2660.26		2943.80
Crude protein	24.11		20.04

Table 3 performance of broiler chicken fed varying level of mixture of *Ocimum gratissimum* and *Vernonia* leaf meal based diets

Parameter	Control	D1	D2	D3	D4	SEM
Initial body weight (kg/bird)	1.11	1.09	1.11	1.09	1.14	0.01
Final bod weight (kg/bird)	2.04	2.40	2.61	2.53	2.55	0.13
Body weight gain (g/day/bird)	23.93	46.79	53.57	50.71	50.36	9.27
Total feed intake (kg/bird)	3.28	4.06	4.16	4.22	4.34	0.19
Feed intake (g/day/bird)	117.14	145.00	148.57	150.71	155.00	6.72
Feed conversation ratio	4.90	3.10	2.77	2.97	3.10	0.39
Mortality (%)	3.92	4.28	3.33	0.83	4.35	0.65

Control-basal diet, D-25/25kg basal diet, D2-50g/25kg basal diet, D3-75g/25kg basal diet, D4-100g/25kg basal diet, SEM-

Standard error of means

Parameter	Control	D1	D2	D3	D4	SEM
Live weight (kg)	2.15 ^a	1.95 ^{CD}	1.92 ^c	2.11 ^{ab}	1.80 ^c	0.08
Dressed weight	84.19	92.31	91.15	81.04	95.56	3.48
Heart (%)	0.74 ^a	0.56 ^b	0.55 ^b	0.42 ^b	0.59 ^b	0.06
Gizzard (%)	2.26 ^a	2.52 ^a	1.84 ^b	1.95 ^b	1.61 ^c	0.21
Liver (%)	2.19	2.46	2.30	1.71	2.80	0.23
Abdominal fat (%)	0.00 ^c	1.01 ^b	0.00 ^c	0.00 ^c	1.68 ^a	0.45
Intestine (cm)	228.00 ^a	216.00 ^b	186.00 ^d	200.50 ^c	178.00 ^d	11.94

a,b,c. Means with different superscripts across the row are significantly different (p<0.05)

Control-basal diet, D1-25g/25kg basal diet, d2-50g/25kg basal diet, D3-75g/25kg basal diet, d4-100g/25kg basal diet, SEM

Standard error of means

The percentage weight of gizzard of broiler chicken fed 25g leaf mixture/25kg basal diets was similar but significantly (p<0.05) higher than those fed control diet, and significantly (p<0.05) decreased in broiler chicken fed 50, 75 and 100g leaf mixture/25kg basal diets. The percentage weight of liver increased non-significantly (p > 0.05) with graded of mixture of *Ocimum gratissimum* and *Vernonia amygdalina* leaf meal in the based diets, except the broiler chickens fed 75g leaf mixture/25kg basal diet. Mixture of *Ocimum gratissimum* and *Vernonia amygdalina* leaf meal in the based diets of broiler chick of significantly (p< 0.05) increased abdominal fat at 100g/25kg higher than at 25g/25kg. The length of intestine significantly decreased with graded levels of mixture of *Ocimum gratissimum* and *Vernonia amygdalina* leaf meal in the based diets. The length of intestine of broiler chickens fed control diet and significantly (p< 0.05) higher than those fed graded levels of mixture of *Ocimum gratissimum* and *Vernonia amygdalina* leaf meal in the based diets.

Conclusion

Graded levels of mixture of *Ocimum gratissimum* and *Veronia amygdalina* leaf meal in the based diets increased daily feed intakes, and consequently, improvement in feed efficiency and body weight gain of broiler chickens. The leaf mixture cause increased in the percentage weight of gizzard and abdominal fat but reduction in heart and length of intestine of broiler chickens. The use of mixture of *Ocimum gratissimum* and *Veronia amygdalina* leaf meal in equal proportion did not impaired performance characteristics of broiler chickens and hence will be attractive and of interest to farmers.

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