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Research Article

Influence of *Gongronema latifolium* (Utazi) Leaf Meal on the Performance and Haematology of Broiler Chickens

Ekine OA, Onu CJ and George OS

Department of Animal Science, Faculty of Agriculture, University of Port Harcourt, P.M.B 5323, Port Harcourt, Nigeria
***Corresponding author: O.S. George;** *otokini.george@uniport.edu.ng*

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ABSTRACT

This experiment was conducted to determine the impact of the different inclusions rate of *Gongrenemalatifolium* leaf meal on the performance characteristics and haematological traits of broilers. A total of 150-day old broiler (ROSS) chicks were utilized in a Comletely Randomized Design (CRD) experiment. The birds were arbitrarily assigned to five (5) dietary treatments, with 3 replicates, and each replicate having 10 birds. 0% (GLLM) Gongrenemalatifolium leaves inclusion level was alimented to the birds in T1, which was the control diet. While the birds in T2, T3, T4 and T5 had 0.2%, 0.4%, 0.6% and 0.8% inclusion level of *Gongrenemalatifolium* respectively. The experiment lasted for duration of 8 weeks, and blood samples were amassed for analysis. There was no significant difference (P>0.05) in the performance characteristics. Supplementation of *Gongrenemalatifolium* leaf meal partially affected haematological characteristics as it was visually examined that White Blood Cell (WBC) counts and Platelet concentration showed levels of consequentiality (P<0.05), while Packed Cell Volume (PCV), Haemoglobin concentration, Red Blood Cell (RBC) counts, Neutrophils, Lymphocytes, Eosinophils, and Monocytes were not significantly affected (P>0.05). Inclusion of *Gongrenemalatifolium leaf* meal at 0.40% is recommended in broiler diets in the sultry tropics without any deleterious effects in the blood.

Key words: *Gongronema latifolium*, Heamatological parameters, Growth characteristics and Birds

INTRODUCTION

Broilers birds are monogastric animals, mostly grown for meat due to their facility to convert victual to meat within a short period of time. The desideratum for animal protein is that it contains essential amino acids needed for mundane body function. Broiler bird which is relegated under poultry engenderment has been described as the most economic betokens of truncating the animal protein short fall in developing countries (Agbo*et al.*, 2005).. At this time of ecumenical concern over antibiotic resistance in humans and animals due to residual effect from animal product (meat and egg) there arises a desideratum for alternative economically viable victual additives.

One of the major factors that obviate rapid and expeditious expansion of intensive poultry engenderment in developing countries is high cost of feed. Ugochukwu *et al.*, 2003 has optically canvassed that the elevating cost of energy and protein victual stuffs could only be solved by initiating incipient alternatives, which are aliment additives for partial supersession of the conventional energy and protein source that will enhance performance. Vegetables and other leafy plants are kenned to be affluent in vitamins, minerals, protein and fatty acids. They additionally possess antimicrobial (antiviral, bacterial, fungal and parasitic) effects and as such, can be utilized in the feeding of poultry to enhance production (Agbo*et al.*, 2005).

The vegetable being considered in the present study is *Gongronemalatifolium*, commonly called utazi and 'asokeke' in the South East and South West geopolitical zones of Nigeria, respectively, and is utilized as adscititious folk medicine (Ugochukwu*et al.*, 2003). As a medicinal plant, it is utilized in the treatment of many diseases, ameliorating immune system (Mensah, 2008) and utilized in the treatment of stomach quandaries, typhoid pyrexia, dysentery, malaria, worms, cough (Agbo*et al.*, 2005).In order to ascertain steady supply of animal protein to meet the protein needs, it is compulsory to utilize these locallyavailable victual ingredients that will accommodate both as source of nutrients and medicines for the control of poultry diseases and poor performance as well as avail in minimizing the cost of engenderment. Gamaniel and Akah,

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1996 reported that *Gongronemalatifolium leaf* extracts contain five phytochemical compounds including alkaloids, saponins, tannins, flavonoid and glycoside and withal local poultry farmers use if for the treatment of prevalent respiratory diseases[4]. Agbo *et al.* (2005), identified the crop to be alimentally high in iron, zinc, vitamin and amino acids, thus, can be incorporated in the aliments of animals. The growing concern about the high cost of engenderment among poultry farmers call for concerted efforts by animal nutritionist to seek felicitous alimental protocols that will truncate the cost of engendering poultry meat as well as minimize the synthetic content in poultry meat. The result of such work will enhance the engenderment of more salubrious birds by poultry farmers and thus abbreviate the overall cost of aliment and additionally re-kindle the confidence of consumers and their interest to consume more poultry meat and thus be able to derive more benefits associated with victualing poultry meat. Thus, the present study aimed at incrementing the alimental quality of poultry birds utilizing *Gongronema latifolium* as an additive, and will conduct investigations on the effect of varying dietary levels of *Gongronema latifolium* leave repast (GLL) on magnification performance and haematology of broiler birds.

MATERIALS AND METHODS

The experimental was conducted at Alakahia, Obio-Akpor Local Government Area, Port Harcourt, Rivers State, Nigeria. Rivers State is located on longitude 4o 45'N, latitude 6o 50'E (4.750o N, 6.833o E), having an annual average temperature of 26o C (78.8o F) and 2708mm average rainfall

The birds were arbitrarily assigned to five (5) dietary treatments, with 3 replicates, and each replicate having 10 birds. Treatment T1 (control diet) had 0% inclusion level of *Gongronemalatifolium leaves* (GLL), while the birds in T2, T3, T4 and T5 had 0.2%, 0.4%, 0.6% and 0.8% inclusion level of *Gongronemalatifolium* respectively. The birds were raised intensively in a deep litter system. The feed intake of the birds were recorded daily and the bird were weighed weekly.

The *Gongronemalatifolium leaves* were oven dried for (10-12hrs) at a temperature of about 50°c to minimize the moisture content, ground afore incorporating into the aliment as an additive. Both the starter and finisher diet that was utilized for this study was formulated utilizing *Gongrenemalatifolium leaves* as an additive.

Two birds from each replicate were randomly selected and the blood samples from them for the following haematology parameters : Packed Cell Volume (PCV); Haemoglobin concentration (Hb); ;White Blood Cell (WBC); Red Blood Cell (RBC); Platelets; Neutrophils (N);Lymphocytes (L); Monocytes (M); Eosinophils (E). The data engendered was analyzed utilizing the one-way ANOVA Procedure (SPSS version 20) while paramount differences in the mean were disunited utilizing Duncan Multiple Range Test (DMRT).

RESULTS

Table 3 shows the effects of dietary *Gongronema latifolium* Meal supplements on the performance indices of broiler birds. The results show that, dietary treatments of *Gongronema latifolium* meal at different inclusion levels did not significantly (P>0.05) affect the final weight gain, weekly weight gained, weekly feed intake, and feed conversion ratio across the treatments.

Data on Table 4 illustrates the effect of *Gongronemalatifolium meal* on heamatological parameters of broiler birds. The Packed Cell Volume, Haemoglobin concentration, Red Blood Cell (RBC) count, neutrophils, lymphocytes, eosinophils, and monocytes were not significantly affected (P>0.05) by dietary inclusion of *Gongronemalatifolium* meal, while the White Blood Cell (WBC) counts and Platelet concentration were significantly affected (P<0.05) by the dietary inclusion of *Gongronemalatifolium* meal. Birds fed 0.4% inclusion of *Gongronemalatifolium*meal had the highest value, while birds alimented 0.8% inclusion of *Gongronemalatifolium* meal had the lowest value, the Platelet concentration withal showed a homogeneous trend.

DISCUSSION

The present study was conducted to assess the salutary functions of *Gongronemalatifolium* leaves meal leaf as phytogenic feed additives on performance and haematology of broiler birds. It was optically canvassed that significant (P>0.05) differences did not subsist among treatments in the initial body weights, final weights, weekly weight gain, and feed conversion ratio of the broiler birds. The findings does not support the report of Ani *et al.*, 2013, who reported consequential differences (P<0.05) among treatments in final body weight, average daily body weight gain, total body weight gain and feed conversion ratio in their study. The results of this study may be attributed to differences in the efficacy of the test materials (utazi leaves) and the different levels of inclusion utilized by Ani *et al.*, 2013(1.0%, 1.4%, and 1.8%). Okafor, 2005 and Kubmarawa 2007 had reported that *Gongronemalatifoliumis* one of the most frugal and most available sources of consequential proteins, vitamins, minerals and essential amino acids that can boost the physiological status of birds and promote their magnification. The inclusion of *Gongronemalatifoliumin* the broiler diet might have resulted in better gut and overall health status, more efficient nutrient utilization, mundane development and better magnification replication of the treated birds, but the present study could not corroborate this report.

The absence of mortality in especially the treatment groups inclines to corroborate the report of Mensah, 2008 that *Gongronemalatifoliumis* kenned to contain paramount compounds that can reinforce the immune system and accommodate as antibiotics for the treatment of prevalent pathogenic strains in birds. Agbo *et al.*, 2005, had reported that *Gongronemalatifolium* can be utilized in the obviation and treatment of many diseases that can cause death in farm animals. It does appear consequently, that *Gongronemalatifolium* can be included in broiler diets as an additive to obviate, abbreviate or manage the incidence

Table 1: Composition of broiler starter diet

Ingredient	T_1 0%	T_2 0.2%	T_3 0.4%	T_4 0.6%	T_5 0.8%
Maize	40.95	40.75	40.55	40.35	40.15
PKC (Mech.)	7.5	7.5	7.5	7.5	7.5
Soya bean meal	13	13	13	13	13
Groundnut cake	14	14	14	14	14
Fish meal	7.75	7.75	7.75	7.75	7.75
Wheat bran	7	7	7	7	7
Soya oil	3	3	3	3	3
Bone meal	3	3	3	3	3
D-L Methionine	0.5	0.5	0.5	0.5	0.5
Lysine	0.5	0.5	0.5	0.5	0.5
Vitamin/Mineral PMX	2.5	2.5	2.5	2.5	2.5
Utazi leaf	0	0.2	0.4	0.6	0.8
Salt	0.3	0.3	0.3	0.3	0.3
Total	100	100	100	100	100
	Calculated Nutrient Composition				
Crude Protein %	23.06	23.11	23.16	23.21	23.26
ME Kcal/Kg	2805.29	2804.98	2804.66	2804.35	2804.03
Crude fibre %	4.78	4.78	4.78	4.78	4.79
Oil %	6.65	6.65	6.65	6.65	6.64
Analyzed nutrient composition					
Crude Protein %	22.89	23.10	23.00	23.50	23.65
ME Kcal/Kg	2815.43	2800.10	2864.54	2870.50	2809.32
Crude fibre %	4.38	4.82	4.87	4.82	4.89
Oil %	6.75	6.67	6.59	6.78	6.49

Table 2: Composition of broiler finisher diet

Ingredient	T_1 0%	T_2 0.2%	T_3 0.4%	T_4 0.6%	T_5 0.8%
Maize	51.5	51.3	51.1	50.9	50.7
PKC (Mech.)	5	5	5	5	5
Soya bean meal	10	10	10	10	10
Groundnut cake	10	10	10	10	10
Fish meal	7.7	7.7	7.7	7.7	7.7
Wheat bran	5	5	5	5	5
Soya oil	4	4	4	4	4
Bone meal	3	3	3	3	3
D-L Methionine	0.5	0.5	0.5	0.5	0.5
Lysine	0.5	0.5	0.5	0.5	0.5
Vitamin/Mineral PMX	2.5	2.5	2.5	2.5	2.5
Utazi leaf	0	0.2	0.4	0.6	0.8
Salt	0.3	0.3	0.3	0.3	0.3
Total	100	100	100	100	100
	Calculated nutrient composition				
Crude Protein %	20.06	20.11	20.16	20.21	20.26
ME Kcal/Kg	3007.76	3007.44	3007.13	3006.81	3006.5
Crude Fibre %	4.1	4.1	4.1	4.1	4.1
Oil %	7.57	7.57	7.57	7.57	7.56
Analyzed nutrient composition					
Crude Protein %	20.08	19.91	20.62	19.21	20.57
ME Kcal/Kg	3014.35	3001.00	3003.81	3027.02	3002.05
Crude fibre %	4.10	4.20	3.98	4.19	4.00
Oil %	6.89	8.01	7.75	7.94	7.06

Table 3: Effects of different levels of *Gongronemalatifolium* on performance parameters

Parameter	T_1 0%	T_2 0.2%	T_3 0.4%	T_4 0.6%	T_5 0.8%
Initial weight (g)	43.5±0.29	43.5±0.29	43.5±0.50	43.5±0.29	43.5±0.15
Final weight (g)	1855.43±114.16	1933.50±31.15	1812.20±63.27	1860.00±64.66	1907.00±2.65
Weight gain (g)	226.50±14.23	236±3.93	221.09±7.95	227.06±8.08	232.94±0.39
Feed Intake (g)	4493.38±0.00	4480.54±0.00	4505.71±0.00	4476.88±0.00	4501.46±0.00
FCR	20.00±1.25	18.98±0.32	20.43±0.71	19.77±0.73	19.33±0.03
Mortality	0±0.00	0±0.00	0±0.00	0±0.00	0±0.00

of disease causing organisms in broiler birds. The inclusion of *Gongronemalatifoliumin* broiler diets may additionally avail to minimize the cost of medication by the rural or resource poor farmers, since the vegetable is yarely available and can be obtained at minimal cost to the farmer.

Table 4: Effects of *Gongrenemalatifolium*meal on the Haematological indices of broiler birds

Parameter	T_1 0%	T_2 0.2%	T_3 0.4%	T_4 0.6%	T_5 0.8%
Pack Cell Volume (%)	25.33 ± 1.7	27.67 ± 0.8	24.00 ± 1.1	27.00 ± 0.5	28.00 ± 1.1
Haemoglobin (g/dl)	8.43 ± 0.5	9.23 ± 0.2	8.00 ± 0.4	9.00 ± 0.1	9.33 ± 0.3
RBC ($x10^6$/ul)	3.60 ± 0.2	4.06 ± 0.2	3.46 ± 0.1	3.76 ± 0.1	4.06 ± 0.1
WBC ($x10^6$/ul)	12.13^{ab} ± 0.2	11.67^{b} ± 0.9	14.67^{a} ± 0.6	12.67^{ab} ± 0.8	10.23^{b} ± 1.0
Platelet ($x10^3$/ul)	258.00^{ab} ± 7.0	283.33^{ab} ± 16.4	316.00^{a} ± 11.5	245.67^{b} ± 7.4	272.33^{ab} ± 31.3
Neutrophils	35.67 ± 3.4	38.33 ± 3.7	35.67 ± 2.3	30.00 ± 2.5	29.33 ± 3.1
Lymphocytes	53.33 ± 4.4	51.67 ± 4.4	52.00 ± 2.0	59.00 ± 2.0	59.00 ± 2.0
Eosinophils	3.00 ± 0.5	3.00 ± 0.5	4.00 ± 0.5	3.00 ± 0.5	3.00 ± 0.8
Monocytes	8.00 ± 1.1	7.00 ± 1.0	8.33 ± 0.8	8.00 ± 1.1	8.00 ± 1.1

[abc:] Means having different superscripts on the same row are significantly (P<0.05) different.

The haematological profile of the experimental birds shows that Packed Cell Volume, Haemoglobin concentration, Red Blood Cell count, Neutrophils, Lymphocytes, Eosinophils, and Monocytes were not significantly affected (P>0.05) by dietary inclusion of Gongronemalatifoliummeal. These findings were not in accedence with Kubmarawa[7] who reported that birds alimented Gongronemalatifolium repast showed consequential differences (P<0.05) on Packed Cell Volume, Haemoglobin concentration, Red Blood Cell count, Neutrophils, Lymphocytes, Eosinophils, and Monocytes parameters. The results further showed that White Blood Cell count and Platelets concentration were numerically higher, but not significantly different (P>0.05) for birds in T3 (0.4%) and the Control

The results on haematology, varied and without any definite trend, this could be due to sundry levels of interaction between the animal's internal environment on the one hand and the active ingredients in the test material on the other. Akinnugae*et al*, 2011 reported homogeneous inconsistencies in haematological values in replication to administration of varying doses of ethanolic extracts of *Gongronemalatifolium* to rats. Since the Platelets count was numerically higher in T3 than the Control in this study, some benign effects can be attributed to the inclusion of *Gongronemalatifolium* leave meal to the diet of broilers.

In view of the above findings, the inclusion on *Gongrenemalatifolium* supplementation (0.2%, 0.4%, 0.6% and 0.8%) did not statistically (P>0.05) affect performance characteristics. Supplementation of *Gongrenemalatifolium* meal partially affected haematological characteristics as it was visually examined that White Blood Cell count and Platelets concentration showed levels of consequentiality(P<0.05). while, Haemoglobin concentration, Red Blood Cell count, Neutrophils, Lymphocytes, Eosinophils, and Monocytes were not significantly affected (P>0.05) by dietary inclusion of *Gongronemalatifolium* leave meal.

It is ergo, recommended that *Gongrenemalatifolium* meal can be integrated to the diet of broilers at 0.40%, in the sultry tropics without any deleterious effect in the blood. Further researches are additionally recommended, to investigate the efficacy of *Gongrenemalatifolium* meal utilizing a higher caliber of inclusion in broiler diets.

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