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Effect of Scent Leaf on Haematological Indices of Broilers

Ndubuisi-ogbonna Lois Chidinma[a], Abdur-rahman O. Abdullah[b], Afodu Osagie John[c*], Ayo-bello Taofeek Ayodeji[d], Akinboye Olufunso Emmanuel[e], Popoola Ibrahim[f], Chioma Gibson Ogbonna[g], Shobo Bolatito Adenike[h], Ajayi Opeyemi Arinola[i]

[a,b,f,g,i]*Department of Animal Science*

[c,d]*Department of Agricultural Economics & Extension*

[e,h]*Department of Agronomy and Landscape Design, School of Agriculture and Industrial Technology, Babcock University, Ilisan Remo Ogun State, Nigeria*

[c]*Email: oafodu@gmail.com*

Abstract

A 56-days feeding trial was conducted to evaluate the effects of dietary inclusion of *Ocimiumm gratissimmum* leaf meal on the haematological indices of broilers. The *Ocimum gratissimmum* leaves uses in the experiment were manually harvested, air-dried and milled to become *Ocimum gratissimmum* leaf meal. The *Ocimum gratissimmum* leaf meal was included in broiler starter to finisher diets at 0.50,100, and 150g levels respectively. One hundred and twenty unsexed day old broilers chicks Arbor acre broiler chicks were raised on self-compounded mash for eight were used. They were divided into 4 groups of 30 birds each and randomly assigned to the 4 experimental diets in a completely randomized design (CRD). Each group was sub-divided into 3 replicates of 10 birds each and each replicate housed in a cage fitted with necessary brooding facilities. Feed and water were given to them ad libitum for 8 weeks. At the end of the feeding trial, blood was collected from the birds, 3 per treatment and analyzed for haematological incides. Haemoglobin (Hb) and packed cell volume (PVC) of birds were not significantly reduced ($P<0.05$) but were within considerate range normal for birds.

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* Corresponding author.

The haematological parameters obtained from this suggest that dietary inclusion of *Ocimum gratissimmum* leaf meal has no deleterious effects on the internal physiology of broiler.

Key Words: Scent leaf meal; starter broilers; and haematological indices.

1. Introduction

The importance of poultry industry to the socioeconomic development of any country cannot be overemphasized as a result of its ability to provide animal protein at a relatively shorter duration and at reasonable cost to the customer [1].

Broiler production is a vital and common means of live hood among farmers in Nigeria. Broilers production has made significant contribution to human food [2]. Broiler meat is one of the primary sources of income and employments to Nigerians compared to other domestic animals. Many broiler farms have lost money sometimes because of diseases [3].

It has been documented that one of the best way of assessing the health status of animals, is the use of blood examination. Mainly because it plays a vital role in physiological nutritional and pathological status of organisms. The effect of both raw and processed feed on the haematological indices of animals have been reported [4].

Haematolgy is the study of the morphology and physiology of blood. It is mainly concerned with the diagnosis and monitoring of diseases of the blood and blood-forming organs. Haematolgy remains, nevertheless, indispensable diagnostic tools to check health and diseases in individuals, for monitoring the response and progress of patients to therapeutic regimes and to offer a prognosis. The routine collection and processing of the blood samples allows the evaluation of hematological responses to diseases [5].

The medical plants and herbs have been used for many years in the treatment of various diseases in animal and human beings. This day's utilization of these medicinal plants is increasing, due to the value of traditional systems and prohibition of most of antimicrobial growth promoters.

The scent leaf (*Ocimum gratissimmum*) is a medical plant widely distributed in the tropics of the Africa and Asia. It has been asserted to provide various culinary and medicinal properties. These medicinal properties exert bateriostatic and bactericidal effects of some bacteria. These effects have attributes to the peptides, alkaloids, essential oils, phenols and flavonols which are major components in these plants [6].

1.1 Objectives

The main objective of this is to determine the effect of Scent leaf *Ocimum gratissimmum* leaf on haematological indices of broilers. The specific objectives are:

- To determine the haematological indices of broilers feed with experimental diet.

1.2 Justification

Some antibiotics used in meat production have residual effects which in turn are harmful to human health, and some bacteria develop residence to antibiotics in animals.

These developments have led to decreasing acceptance of the addictives (antibiotics) in many countries of the world, whereas majority of medicinal plants do not have residual effects [7] Therefore, considering the side effects and the extracts and biologically protozoan builds against drugs, more attention should be given to the extracts and biologically active compounds which are isolated from plant species commonly used in herbal medicine [8]. Hence, there is need for the study of potentials use of *Ocimum gratissimmum* leaf on the haemotological indices of broilers.

1.3. Statement of problem

The broiler industry in Nigeria is primarily driven by the production of saleable white meat. A major challenge the producer must overcome in the pursuit of this goal is that the effect of antibiotics drugs residue on broiler meat.

2. Materials and methods

2.1 Experimental Site

The study was conducted at the poultry unit, teaching and research farm of Babcock University, Ilishan Remo in the rain forest zone of Nigeria, with a mean temperature of 27^0C. Ilishan is in the southwest geopolitical zone of Nigeria and falls on the latitude of 6^054^0N of the equator and longitude 3^042^0E of Greenwich.

2.2 Experimental Birds and Management

A total of one hundred and twenty (120) day old unsexed and healthy commercial broiler chicks were procured. An improvised brooding house labeled from treatment 1,2,3,4 was used at the experimental site. The brooding house and its environment were cleaned thoroughly, washed with disinfectant. Electric bulbs used as source of light and heat. Polythene was used to cover the brooding house to facilitate warm environment for the birds.

Normal management practices like vaccination was administered to the birds and feeling giving of water supplied at ad libitum. Drug administration was given to birds in Treatment 1 containing 0% of scent leaf while treatment 2, 3, and 4 were given scent leaf at different concentration.

The 120 broiler chicks were randomly allotted o four dietary treatments with 30 birds per treatment consisting of 3 replicates of 10 birds per replicate.

2.3 Experimental Diet, Procurement and Processing Of Scent Leaf

Ocimum gratissimmum leaves were procured from Ilishan town, in Ikenne Local Government Area of Ogun

state. The leaf was spread and air dried until it becomes crispy, but still retaining the greenish coloration. The dried leaves *Ocimum gratissimmum* was then hammer milled through a 2mm screen to obtain a final meal. Four Experimental boiler starter and finisher diets was being formulated, and scent leaf meal incorporated at 0g, 50g, 100g, and 150g dietary levels. Using Treatment 1, Treatment 2, Treatment 3, and Treatment 4 respectively. The diets were formulated to meet requirement of kitchen [9].

2.4 Gross Composition of experimental broiler diets

Table 3: Feed formulation

Starter Formulation	**(KG):**	**Finisher Formulation**	**(KG):**
Maize	47.00		53.50
Soy bean meal	18.50		16.50
Fish Meal	2.00		0,40
GNC	17.50		13.80
Wheat Offal	10.00		10.80
Bone Meal	3.00		3.00
Oyster shell	1.0		1.00
Vit/Min Prem	0.25		0.25
Methionine	0.25		0.25
Lysine	0.25		0.25
Salt	0.25		0.25
Total	100kg		100kg

2.5 Experimental Design

The experimental design was a Completely Randomized (C.R.D)

2.6 Blood Sample Collections

On day 56,2ml syringes was used to collect blood sample from three birds per replicate each through the jugular vein. The 2ml blood sample collected was transferred into Ethylenediaminetetraacetic acid (EDTA) bottles to prevent coagulation for haematological analysis. The sample was taken to Babcock University Teaching Hospital (BUTH) laboratory for analysis.

2.7 Parameters analyzed

The following haemotological parameters was taken on the collected blood samples by different method; haemoglobin concentration, red blood cell, white blood cell, neutrophils, basophils, lymphocytes, eosinophils,

haematocrit, mean corpuscular volume, monocytes, white cell differential count, packed cell volume, mean corpuscular haemoglobin.

2.8 Statistical Analysis

The data collected was subjected to analysis of variance (ANOVA) and the treatment means was separated using Duncan multiple range test [10].

3. Results and discussion

3.1 Haematological indices of Broilers fed Experimental Diets

This study was conducted to evaluate the effect of scent leaf on the haematological indices of broiler birds administered at different level, that ranges from 50,g to 100g per 25kg feed. The result on the haematological values of the broilers used for the experiment on effect *O. gratissimmum* in Tables 4.2, 4.4 and 4.5.

Table 4: Effect of *Ocimum gratissimmum* leaf Meal on the Haematological Parameters of Broilers

Parameters	T1	T2	T3	T4	±SEM
PVC	33.02	33.84	34.78	33.37	0.4729NS
HB	17.29	14.58	15.53	15.47	0.4078NS
WBC	95.16	89.74	50.84	81.72	1.0479**
PLT	9.56	5.20	8.89	7.00	0.4231NS
RBC	2.41	2.65	2.44	2.51	0.1266NS
LYM	92.11	95.00	98.11	96.33	0.3412**
GRANU	3.50	2.20	1.33	2.33	0.3191NS
MIDCELL	4.78	2.88	1.44	1.83	0.2525**

The haematological indices as shown in table above indicates that the red blood cell (RBC) counts, the packed cell volume (PVC), the haemoglobin, platelet, and granu at the end of the experiment (8 weeks) were not significant different ($p>0.05$) from each other and were within the normal physiological range of avian species, while WBC, LYM and MIDCELL were significant at $p>0.05$.

The value obtained from the packed cell volume (PVC) ranges from 33.02% to 34.78% which were similar to those previously obtained by [11]. But lower than the value of 25 to 45% reported by [12]. The packed cell volume is important in the diagnosis of anaemia, when the PVC values are lower than 35% reported by [13], suggesting anaemia.

The difference in the mean WBC values of birds implies differences in the essential body defiance system [14]. Hence, the birds treated with 100g of *Ocimum gratissimmum* have the highest immunity. See table below.

Table 5: Descriptive Statistics of broilers fed with 100g inclusion level of *Ocimum gratissimmum.*

Parameters	N	Mean	Std Dev	Std Error	Coeff
PVC	9	34.778	4.964	1.655	14.274
HB	9	15.533	1.954	0.651	12.583
WBC	9	50.844	12.730	4.243	25.037
PLT	9	8.889	4.372	1.457	49.181
RBC	9	2.444	0.308	0.103	12.581
LYM	9	98.111	1.364	0.455	1.390
GRANU	9	1.333	0.577	0.333	43.301
MIDCELL	9	1.444	0.882	0.294	61.056

The haemoglobin concentration determines the oxygen carrying capacity of the bird's circulatory system and the red blood cell (RBC) does the transporting of oxygen from the lungs to the tissues. The result obtained also indicated that the red blood cell (RBC) counts ranges from 2.41 to 2.65×2.5 ($10mm^3$) which falls within the established mean of 2.0× (10^3mm^3) for exotic chickens [15]. The white blood cells (leucocytes) are body defiance cells that prevent the entering of infections into the body system. The white blood cell counts within the normal range of 50,000 to 95,000 which is line with the work of [16].

The platelet were found not to be significantly different ($p<0.05$) at the end of the experiment.

Table 6: Descriptive statistics of broilers fed with zero inclusion level of *Ocimum gratissimmum.*

Parameters	N	Mean	Std Dev	Std Error	Coeff
PVC	9	33.02	9.38	3.13	28.42
HB	9	17.30	7.90	2.63	45.69
WBC	9	95.17	50.41	16.802	52.972
PLT	9	9.56	3.71	1.237	38.845
RBC	9	2.41	0.703	0.234	29.162
LYM	9	92.11	5.183	1.728	5.627
GRANU	9	3.50	2.507	0.886	71.632
MIDCELL	9	4.78	2.728	0.909	57.107

Table 7: Descriptive statistics of broilers fed with 50g inclusion level of *Ocimum gratissimmum.*

Parameters	N	Mean	Std Dev	Std Error	Coeff
PVC	5	33.840	3.554	1.589	10.501
HB	5	14.580	2.836	1.268	19.450
WBC	5	89.740	16.278	7.280	18.139
PLT	5	5.200	7.430	3.323	142.878
RBC	5	2.648	0.230	0.103	8.892
LYM	5	95.00	3.082	1.378	3.244
GRANU	5	2.200	1.643	0.735	74.689
MIDCELL	5	2.800	1.789	0.800	63.888

The PVC values are lower than 35% reported by [17]. Suggesting anaemia. The differences observed in the mean values pf PVC of birds at the end of the experiment suggest that the birds fed with 150g of *O. gratissimmum* were least susceptible to anaemia than the birds treated with 50 and 100g of *O. gratissimmum.*

Table 8: Descriptive statistics of broilers fed with 150g inclusion level of *Ocimum gratissimmum.*

Parameters	N	Mean	Std Dev	Std Error	Coeff
PVC	6	33.367	4.455	1.819	13.352
HB	6	15.467	1.991	0.813	12.871
WBC	6	81.717	23.100	9.430	28.268
PLT	6	7.000	6.164	2.517	88.063
RBC	6	2.505	0.311	0.127	12.435
LYM	6	96.333	1.862	0.760	1.933
GRANU	6	2.333	0.577	0.333	24.744
MIDCELL	6	1.833	1.169	0.477	63.766

4. Conclusion and recommendations

In this experimental study, it was revealed that *Ocimum gratissimmum* does not induce any adverse effect on the bird's blood profiles. It proved that a level of 50-150g *Ocimum gratissimmum* inclusion has positive effects on Haematological indices of the birds. However, the most effective rate is 100g/25kg. Thus, the use of *Ocimum gratissimmum* leaf meal at inclusion rate of 100g/25kg of broiler diet could be used instead of antibiotics, because birds fed with this has the lowest range of WBC value which shows bird immunity power. Also since the whole world is fighting against the use of antibiotics in livestock production. Further research can be carried out on efficacy of extract (juice) in *Ocimum gratissimmum.*

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