

SERUM BIOCHEMICAL INDICES OF COMMERCIAL BROILER CHICKEN FED *Ocimum gratissimum* LEAF MEAL AS NATURAL ANTIBIOTICS ALTERNATIVE

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ABSTRACT

A 35-day feeding trial was conducted to evaluate the effects of dietary inclusion of *Ocimum gratissimum* leaf meal at 0, 5, and 10 g, per kg of commercial feed, respectively on the serum biochemistry of broilers. Ninety-nine (99) day old broiler chicks were raised on commercial feed for eight days. Birds were divided into 3 treatments and randomly assigned to the 3 experimental diets in a completely randomized design (CRD). Each group was sub-divided into 3 replicates of 11 birds each. Diet and water were given to them ad-libitum for 4 weeks. At the end of the feeding trial, blood was collected from the birds, 1 per treatment and analysed for serum biochemistry. There was no significant difference ($p < 0.05$) recorded for total protein, albumin, globulin, blood urea nitrogen (BUN) and creatinine across dietary treatments. Bird fed diet T1 had the highest total protein (6.6%), while the lowest value (5.9%) for total protein was recorded on bird fed diet T3. Bird fed diet T3 recorded least albumin (1.1g/dl) while the highest albumin (1.3g/dl) was recorded in bird fed diet T1. However, bird fed diet T2 had the highest AST (190.50 I. U/L) while the lowest AST (179.00 I. U/L) was recorded in bird fed diet T3. The highest blood urea nitrogen (BUN) (6.8mg/dl) was observed in bird fed diet T1 while lowest BUN (6.4mg/dl) was recorded in bird fed diet T2. The study revealed that inclusion of *Ocimum gratissimum* leaf meal in diet of the broiler has no negative effect on the starter broilers.

Keywords: Serum biochemistry, Scent leaf meal, Broiler starter

INTRODUCTION

Broiler meat is consumed by most people irrespective of tribe, race or religion. But poultry production is challenged by high cost of feeds and infection. The search for “natural and safe alternative” drugs to reduce the cost of disease treatments/prevention and pest control in livestock production, which will safeguard public health has resulted to the introduction of many herbal products in livestock diets (Cardozo *et al.*, 2004). Spices and herbal products are in form of bulb, rhizome, knot and leaves, which improve foods palatability through their aroma, increase digestibility and impact some medical function when consumed by man or animals as part of their food and enhance performance of broiler chickens (Odoemelam *et al.*, 2012). Examples include *Alium salivium* (Garlic), *Piper nigrum* (Black pepper), *Ocimum gratissimum* (Scent leaf) and many others. In pursuit of improved broiler health and in order to fulfil consumer expectation in relation to food quality, poultry farmers include natural herbal materials in the diet of their birds (Gardzielewska *et al.*, 2003). *Ocimum gratissimum* is used in the treatment of skin infections, gastroenteritis, stomachache, cuts, wounds, inflammation, and diuretic and also for hypertensive activities. It is also used against piles, diarrhea and hemorrhoid (Omotayo, 2007). Thus, this study was designed to evaluate serum biochemical indices of broiler chicken fed varying inclusion levels of *Ocimum gratissimum* leaf meal.

MATERIALS AND METHODS

Experimental Site

The experiment was conducted at the Poultry Unit, Teaching and Research Farm, Oyo State College of Agriculture and Technology, Igbo-ora. The experimental area lies in the savanna Forest zone on latitude 7° 15'N and longitude 3° 30'E, with an elevation 140m above sea level. The average minimum temperature is about 20.50°C and maximum average temperature of about 32.50°C. The average humidity in the study area is 58.0%.

Harvesting and Processing of Experimental Ingredient (Scent leaf)

Before the treatment work commenced fresh leaf of *Ocimum gratissimum* (scent leaf) were harvested around the college (OYSCATECH) premises, they were well rinsed and dried at room temperature. After drying, the scent leaves were milled with milling machine, sieved and were stored. The milled *Ocimum gratissimum* (scent leaf) was thoroughly mixed with the feed at the rate of 0g, 5g, and 10g per 1kg of feed.

Experimental birds and their management

A total of 99 Day-old-chicks were obtained from Marveprerola Nigeria Enterprise. The brooding pen was washed and cleaned thoroughly with disinfectant. On the arrival of the birds, they were treated with Oxyfura vitamin soluble powder against stress and bacteria. The birds were vaccinated against Infectious Bursal disease and

Newcastle disease using Gomboro vaccine (7th and 21st days) and Lasota vaccine on the (14th and 32nd days) respectively, by dissolving 100 doses of wash vaccine in 2litres of chlorine free water. The birds were also treated against coccidiosis using proccoc at 100g per 120 litres of water at 24th-28th day for 5days. The birds were fed with ultima starter broiler feed throughout the experiment period. At the 2nd week, the birds were moved to the rearing unit which house 11 broiler chickens per treatment, and they were offered one of the three dietary treatments for the duration of the experiment.

Experiment Diets

Birds in Treatment 1 were fed with 0g *O. gratissimum* diet per 1kg of commercial feed, while birds in Treatment 2 were fed with 5g *O. gratissimum* diet per 1 kg of feed and birds in Treatment 3 were fed with 10g *O. gratissimum* diet per 1 kg of commercial feed.

Blood Sample Collection and analysis

On day 35, 5ml syringes were used to collect blood sample from a birds per replicate each through the wing vein. The blood samples collected were transferred into plain bottles for serum biochemical analysis. The sample was taken to laboratory for analysis.

Statistics Analysis

Data obtained in the study were arranged in a Completely Randomized Design (CRD). The obtained data were subject to one-way analysis of variance (SAS, 2013) while differences among the means were separate using Duncan's multiple range test (Duncan, 1955).

Table 1: Proximate composition of *Ocimum gratissimum* leaves

Parameters	Composition (%)
Dry Matter	24.68
Ash	10.00
Crude Protein	4.30
Crude Fibre	10.00
Fat	6.00
NDF	55.00
ADF	36.00
ADL	11.00

NDF - Neutral Detergent Fibre, ADF - Acid Detergent Fibre, ADL - Acid Detergent Lignin

RESULT AND DISCUSSION

The result of serum parameters is shown in Table 2. The result revealed that serum biochemical indices were significantly ($p < 0.05$) influenced by the treatment except blood urea nitrogen and creatinine. Values of total protein and albumin obtained in this study were within normal range reported for healthy birds by Ajuonuma *et al.* (2013). The result of this study therefore indicates that the birds were in healthy condition and indicate the ability of the diets to support production of these blood components.

Table 2: Serum indices of Broilers fed varying levels of *O. gratissimum* leaf meal diet

Parameters (%)	T1 0g(OG)	T2 5g(OG)	T3 10g(OG)	SEM (±)
Total Protein (g/dl)	6.60 ^a	6.30 ^b	5.90 ^c	0.17
Albumin (g/dl)	1.30 ^a	1.15 ^b	1.10 ^c	0.05
AST (I.U/L)	187.50 ^{ab}	190.50 ^a	179.00 ^c	2.81
ALT (I.U/L)	27.50 ^b	28.00 ^a	22.00 ^c	1.57
ALP (I.U/L)	206.50 ^b	203.00 ^c	210.00 ^a	1.65
BUN (mg/dl)	6.80 ^a	6.40 ^a	6.50 ^a	0.09
Creatinine (mg/dl)	0.55 ^a	0.50 ^a	0.50 ^a	0.01
Globulin (g/dl)	5.30 ^a	5.15 ^b	4.80 ^b	0.12
A.G. Ratio	0.34 ^b	1.12 ^a	0.23 ^c	0.23

^{a, b and c} Means along the same row having any identical superscript are not significant ($p > 0.05$); Aspartate Amino Transferase (AST), Alanine Amino Transferase (ALT) and Alkaline Phosphatase (ALP), Blood Urea Nitrogen (BUN), OG= *Ocimum gratissimum*

However, there is significant difference ($p < 0.05$) in the values of AST, ALT, ALP and A.G. Ratio across the dietary treatment. The activities of AST, ALT and ALP in the blood are bio-indicators of liver function and damage (Yildirim *et al.*, 2011). The results obtained in this study suggest that *Ocimum gratissimum* leaf meal did not affect the function and integrity of the liver, since the activity of this liver enzymes serves as sensitive biomarkers of hepatotoxicity. Alkaline phosphatase (ALP) is an enzyme produced mainly by the intestinal mucosa, liver, bone, kidney, and placenta. A reduction in its activity may be an indication of a slowdown of bone growth. Higher serum levels of ALP are observed when there is increased osteoblastic activity, involving the formation and mineralization of bone associated with increased skeletal growth. The ALP value observed in diet T3 (10g scent leaf) was higher thus, the result obtained in this study for ALP showed that it enhances bone formation and mineralization.

CONCLUSION/APPLICATION

The results of this study indicated that inclusion of *Ocimum gratissimum* meal in the diet of broiler chicken has no detrimental effect on the serum biochemical indices. In addition, serum parameters in broilers were better pronounced in all the diets fed.

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