EFFECT OF SANDPAPER (*Ficus exasperata*) LEAF MEAL ON HAEMATOLOGY AND SERUM BIOCHEMISTRY OF BROILER CHICKEN

Adetutu O. I., * Olabode A. D., Jiwuba P. C., Ebiaku V. A. and Nwibo M. J.
Department of Animal Production Technology, Federal College of Agriculture, P.M.B. 7008, Ishiagu.
**Corresponding author's e-mail:* adetutuoi@fcaishiagu.edu.ng (*08136869695*)

ABSTRACT
The trial evaluates effect of sandpaper leaf meal on haematology and serum biochemistry of broiler chicken. Four (4) experimental diets were formulated based on the nutritional requirements of the birds and such that additive values of *Ficus exasperata* leaf in the diets of the birds were 0% (control), 1%, 2% and 3% in treatment 1, 2, 3 and 4 respectively. Total of ninety-six (96) day (Post-hatch) old broiler chicks (Cobb-500 strain) was used for this trial. Randomly divided into four (4) treatments of three (3) replicates and each replicate contained eight (8) birds, which made it a total of twenty-four (24) birds per treatment. Vaccinations and Medication were done as at when due (at first third and fifth week respectively). Data were collected on haematology and serum biochemistry. All haematological parameters evaluated were significantly ($P<0.05$) influenced with inclusion levels of sandpaper leaf meals except White Blood Cell (WBC). Total protein value of 2.66g/dl recorded from 3% (T4) was the highest across the dietary group while 2.39g/dl recorded from the control group (T1) was the least value. Cholesterol, triglyceride and Low-Density Lipoprotein (LDL) values recorded across the dietary treatments decreased with increase in inclusion levels of sandpaper. Conclusion, inclusion levels of sandpaper leaf meal as an alternative to synthetic antibiotics in finisher broiler birds did not have any deleterious effect on the health of the birds as revealed by the result of serum biochemistry and haematological indices.
Key words: Sandpaper, Serum, Haematology, Broiler.

Introduction
Nowadays the herbal substitute to enhance health status and performance is urgently needed (Single and Gupta 2012). The immunity is challenged by environment and feed habits, with the concept that feed with natural antioxidants and micronutrients can boost the immune response (Paliwal *et al*., 2011a). Herbs or extracted oils are safe to be feed to livestock with less risk than antibiotics which has harmful side effect and consider the most effective choice (Barrow, 1992). That is why many types of plants are widely used in alternative medicine (Endo *et al*., 1999). The benefits of herbs raised the hope of using them instead of antibiotics (Panagasa *et al*., 2007). Herbs were recommended to enhance metabolic processes and the health condition of livestock's (Panagasa *et al*., 2012). Within phytogenic feed additives, the content of active substances in products may vary widely, depending upon the plant part used (e.g. seeds, leaf, root, and bark), harvesting season, and geographical origin (Steiner, 2006).

Materials and Methods
The experiment was carried out at the Poultry Unit of the Teaching and Research Farm, Federal College of Agriculture Ishiagu, Ebonyi state. The plant was selected for this study based on its ethno-medicinal use. Fresh leave of sandpaper leaf was harvested (without stock) from middle aged green trees. The leaf was washed in running water and then air dried (to prevent bleaching) for 14 days until crispy but still retaining the greenish tint. The turning of leaf was carried out on regular intervals (daily) to prevent uneven drying and possible decay of leaves. The leaf was hammer milled and converted into ground form which was stored in an air tight container prior to usage. Four (4) experimental diets were formulated for based on the nutritional requirements of the birds and such that additive values of sandpaper leaf in the diets of the birds were 0% (control), 1%, 2% and 3% in treatment 1, 2, 3 and 4 respectively. The composition of the diets was as presented below. A total of ninety-six (96) day (post-hatch) old broiler chicks (Cobb-500 strain) from a reputable commercial farm was used for this trial. The birds were randomly divided into four (4) treatments of three (3) replicates and each replicate contained eight (8) birds, which made it a total of twenty-four (24) birds per treatment. Vaccinations and Medication

(Antibiotics and Extract) were done concurrently as at when due (at first, third and fifth week respectively). Feed and water were given *ad-libitum.* The trial lasted for 8 weeks. Data were collected from one bird from each replicate randomly selected and blood samples were collected for the evaluation of haematology and serum biochemistry parameters. The experiment was laid down in a Completely Randomized Design (CRD). Data collected were analysed by One Way Analysis of Variance using SPSS (23) software and means were compared using Duncan's Multiple Range Test of the same package and considered significant when P<0.05.

Table 1: Composition of Experimental Broiler Finisher Diets

Ingredients	**T1 (0%)**	**T2 (1%)**	**T3 (2%)**	**T4 (3%)**
Maize	56.00	56.00	56.00	55.00
Wheat offal	4.50	3.50	3.50	3.50
Soybean	18.00	18.00	18.00	18.00
Groundnut cake	16.00	16.00	15.00	15.00
Fish	1.50	1.50	1.50	1.50
Bone	2.00	2.00	2.00	2.00
Limestone	1.00	1.00	1.00	1.00
Salt	0.25	0.25	0.25	0.25
Premix	0.25	0.25	0.25	0.25
Methionine	0.25	0.25	0.25	0.25
Lysine	0.25	0.25	0.25	0.25
SLM	-	1.00	2.00	3.00
Total	**100.00**	**100.00**	**100.00**	**100.00**
Calculated values				
ME (kcal/kg)	3030.49	3029.49	3028.48	3027.48
Crude protein (%)	20.42	20.34	20.27	20.20
Ether extract (%)	6.67	6.67	6.67	6.67
Crude fibre (%)	3.30	3.46	3.69	3.85
Lysine (%)	1.24	1.24	1.24	1.24
Methionine (%)	0.57	0.57	0.57	0.57
Calcium (%)	1.12	1.12	1.12	1.12
Phosphorus (%)	0.59	0.59	0.59	0.59

ME = Metabolisable Energy

Results and Discussion

Table 2: Effect of Sandpaper (*F. exasperata*) leaf meal on Haematology of Broiler Chicken

Parameters	**T1 (0%)**	**T2 (1%)**	**T3 (2%)**	**T4 (3%)**	**SEM**
Packed cell volume (%)	26.15^{c}	27.34^{b}	27.99^{b}	29.12^{a}	**0.24**
Haemoglobin (g/dl)	6.27^{c}	6.82^{b}	7.07^{b}	7.48^{a}	**0.09**
Red blood cell ($x10^{6}\mu/l$)	1.69^{c}	1.87^{b}	2.10^{a}	2.18^{a}	**0.04**
Whitw blood cell ($x10^{3}\mu/l$)	22.64	22.38	22.33	22.90	**0.08**
Mean corpuscular vol. (fl)	125.66^{c}	128.47^{c}	146.37^{b}	172.39^{a}	**3.66**
MCH (pg/cell)	32.53^{c}	33.60^{bc}	41.88^{a}	34.35^{b}	**0.71**
MCHC (pg/cell)	325.30^{c}	335.95^{bc}	418.84^{a}	343.54^{b}	**7.18**

^{abcd} Means with similar superscripts along the same row are not significantly (P > 0.05) different

All haematological parameters evaluated were significantly (P<0.05) influenced with inclusion levels of sandpaper leaf meals except White Blood Cell (WBC). Values recorded from Packed Cell Volume

(PCV), Haemoglobin (Hb), Red Blood Cell (RBC), White Blood Cell (WBC), Mean Corpuscular Volume (MCV) were all progressively increase (P<0.05) as inclusion levels of sandpaper increased in the diets. Significant (P<0.05) and highest PCV value of 29.12% was recorded from 3% (T4) while least value of 26.15% was recorded from 0% (T1). Highest (P<0.05) RBC value of 2.18 $x10^6$µ/l was recorded from 3% (T4) while least value of 1.69 $x10^6$µ/l was recorded from 0% (T1). The result of the present study is in accordance with the report of Mohammad *et al*. (2015) where haemoglobin concentration in neem fed group was significantly (P<0.05) increased compared to control group. Higher RBC values recorded from the groups that received sandpaper leaf meal was an indication that no anaemic related defects include bloody diarrhoea, bleeding, blood sucking parasites among others (Chineke *et al*., 2006). Treatment 3 and 4 that received 2% and 3% inclusion levels of sandpaper leaf meal had higher MCV values (146.37fl; 172.39fl) than the recommended range of 90fl – 140fl reported by Aikpitanyi and Imasuen (2019).

Table 3: Effect of Sandpaper (*F. exasperata*) Leaf Meal on Serum Biochemistry of Broiler Chicken

Parameters	T1 (0%)	T2 (1%)	T3 (2%)	T4 (3%)	SEM
Total protein (g/dl)	2.39 ^{b}	2.52^{ab}	2.58 ^{ab}	2.66 ^{a}	**0.04**
Albumin (g/dl)	1.73 ^{b}	1.83^{ab}	1.70 ^{b}	1.92 ^{a}	**0.02**
Globulin	0.66	0.69	0.88	0.73	**0.03**
Urea (mg/dl)	7.27^{a}	7.21^{ab}	6.90 ^{b}	6.88 ^{b}	**0.06**
Creatinine (mg/dl)	0.84^{a}	0.73^{bc}	0.77 ^{b}	0.69 ^{c}	**0.01**
Cholesterol (mg/dl)	187.66^{a}	176.6^{b}	169.80^{bc}	164.13^{c}	**2.00**
Triglyceride (mg/dl)	162.80^{a}	158.18^{ab}	151.00^{bc}	143.55^{c}	**1.98**
High Density Lipoprotein (mg/dl)	159.52^{c}	168.41^{b}	169.44^{b}	179.95^{a}	**1.95**
Low Density Lipoprotein (mg/dl)	46.92^{a}	46.58^{a}	42.34^{ab}	38.50^{b}	**1.03**
Aspartate Aminotransferase (u/l)	77.62^{a}	76.78^{ab}	75.99^{ab}	75.34^{b}	**0.34**
Alanine Aminotransferase (u/l)	680.44^{a}	672.97^{a}	670.11^{a}	650.52^{b}	**3.27**

^{abc} Means with similar superscripts along the same row are not significantly (P > 0.05) different

All parameters evaluated were significantly (P<0.05) influenced by the inclusion levels of sandpaper in the diets of the birds. Total protein value of 2.66g/dl recorded from 3% (T4) was the highest across the dietary group while 2.39g/dl recorded from the control group (T1) was the least value. Urea value diminished progressively as inclusion levels of sandpaper increased in the diet with 0% (T1) having the highest value of 7.27mg/dl and 3% (T4) having the least value of 6.88mg/dl. Values recorded from creatinine in 1% (T2), 2% (T3) and 3% (T4) were significantly (P<0.05) lower when compared to the control group with 0% inclusion levels. Cholesterol, triglyceride and Low-Density Lipoprotein (LDL) values recorded across the dietary treatments decreased with increase in inclusion levels of sandpaper. High-Density Lipoprotein values recorded across the treatments increased as inclusion levels increases. Serum enzymes; AST and ALP values decreased progressively as inclusion levels of sandpaper increased in the diet of broiler birds. The result of this experiment corroborates the report of Kermanshahi and Riasi (2006) in an experiment with Turmeric rhizome powder (phytogenics) who indicated a decrease of 63.9, 50.2 and 63.3% for triglyceride, total cholesterol and LDL-cholesterol levels, respectively, while HDL-cholesterol content was raised up to 15%. According to Faiyaz *et al*. (2012) oral administration of sandpaper leaf extract (aqueous) had been reported to caused significant reductions in plasma total triacylglycerol, cholesterol and β-hydroxybutyrate concentrations in rats. Also, Nimenibio-Uadia, (2003) reported that sandpaper extract is useful in lowering blood lipids. Serum enzymes reported in the present study support the repot of Mirbod *et al*. (2017) and Saraswati *et al*. (2013) who found AST and ALT activities decreased in a dose related experiment by phytobiotics

Conclusion and Recommendation

Inclusion levels of sandpaper leaf meal as an alternative to synthetic antibiotics in finisher broiler birds did not have any deleterious effect on the health of the birds as revealed by the result of serum

biochemistry and haematological indices. Further research is recommended using higher inclusion levels of sandpaper leaf, also its effectiveness and or potency should be accessed using other poultry types especially on egg production and egg qualities.

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