SERUM BIOCHEMISTRY INDICES OF BROILER CHICKENS FED MANGO LEAF MEAL

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ABSTRACT
A total of three hundred Arbor Acer breed day old broiler chicks were obtained from a commercial hatchery with an average (40±0.12g body weight), weighted individually and randomly divided into five (5) Dietary Treatment (Treatment 1: control; Treatment 2: 2.5% Mango Leaf Meal (MLM); Treatment 3: 5.0% MLM; Treatment 4: 7.5% MLM and Treatment 5: 10.0% MLM) with six replicate per treatment and ten birds per replicate in a completely randomized design. The experiment was conducted for the period of eight weeks. Serum biochemistry was measured. Data was analyzed using ANOVA at P>0.05. The alkaline phosphate and alamine transanase show no significant difference (P>0.05. There was significant different in aspartate transaminase (P<0.05). Broiler chicken fed 10.0% MLM (28.33 iu/L) had the highest value. Total protein and glucose shows no significant different. Albumin has significant different (P>0.05) with broiler chickens on 7.5% MLM having the highest value. There are no significant different in total cholesterol and triglyceride. High density lipoprotein and low density lipoprotein show significant different. Broiler chicken fed control diet had the highest LDL (1.33 mmol/L) with the least low density lipoprotein in the treated groups. There is significant different in creatinine. Chicken fed 7.5% MLM (0.83 mg/L) had the highest creatinine followed by control and 2.5% respectively (0.57 and 0.40 mg/L). It could be concluded that 5.0% and 7.5% MLM could be added to broiler chicken diet without any advert effect on the health status of the chicken.

Key words: Serum biochemistry, Mango leaf meal, High density lipoprotein and low density lipoprotein

INTRODUCTION
Some unconventional ingredients have been investigated as partial or total substitute for maize, they include Africa locust bean meal *(Parkia ficoideawelw*), avocado seed meal (*Persia americana*), and mango seed kernel meal (*mangifera indica*) (Aregheore 1998). The use of leguminous multipurpose trees and shrub has been suggested to be a viable alternative source of proteins, vitamins and minerals for poultry feeding plant leaves are commonly processed into leaf meals which have been widely used in feeding non-ruminant animals which include *Leucaena leucocephala, Gliricidia sepium, sesbania sesban and mangifera indica* (Gadzirayi *et al*., 2012).
However, most of these feeds contain anti-nutrients and toxic components such as saponins, lectin, tannins, trypsin inhibitors and cyanogenic glycosides which make them unsafe as protein and carbohydrates sources in livestock production (Aregheore, 1992).
Serum biochemistry indices and haematology has been designed as the study of blood and an important part of clinical pathology as well as diagnostic process (Lute and pryluski, 2008). Serum includes all proteins not used in blood clotting and all the electrolytes, antibodies, antigens, hormones and any exogenous substances (Martin, 2007). The result of haematological and serum analysis is usually used to assess the health status of an animal. Hematological and serum indices have been observed as good indicators of the physiological status of animal and their changes are important in assessing the response of such animal to various physiological situation (Khan and Zafen, 2005).

Therefore, this study evaluate the effect of feeding mango leaf meal on serum biochemistry of broiler chickens

MATERIALS AND METHODS

Experimental site: The experiment was conducted at Poultry Unit Division in Livestock Investigation Department of National Veterinary Research Institute, Vom Plateau State, Nigeria.

Experimental animal and management: A total of three hundred Arbor Acer breed day old broiler chicks were obtained from a commercial hatchery was used for the trial. An average (40±0.12g body weight) were weighted individually and randomly divided into five (5) Treatments with six replicate per treatment and ten birds per replicate. The brooding temperature was kept at an average of 26.5^0C from the first to second week of age. Thereafter, the temperature was lowered to 22^0C for the rest of experimental period. Wood shaving was used as litter material. At day old, antibiotic and anti-stress were given to the birds for three days. From week two to three, first and second Infectious Bursal Disease Vaccine (IBDV) was administered. Then, at week four and five Newcastle Disease Vaccine Lasota were given to the birds respectively.

Table 1: Starter Feed ingredients

Ingredients	0%	2.50%	5.00%	7.50%	10.00%
Maize	51.50	49.00	47.60	47.10	48.60
Wheat offals	10.00	10.00	10.00	9.00	8.00
Soybean cake	18.00	18.00	18.00	18.00	16.00
Groundnut cake	17.10	16.60	16.00	15.00	14.00
Mango leaf meal	0.00	2.50	5.00	7.50	10.00
Bone meal	2.00	2.00	2.00	2.00	2.00
Limestone	0.50	0.50	0.50	0.50	0.50
Premix	0.25	0.25	0.25	0.25	0.25
Salt	0.25	0.25	0.25	0.25	0.25
Lysine	0.20	0.20	0.20	0.20	0.20
Methionine	0.20	0.20	0.20	0.20	0.20
Total					
Calculated nutrient					
Crude protein	21.68	21.94	21.82	21.66	20.86
Enery	2877.15	2842.15	2815.40	2803.20	2805.00
Calcium	1.00	1.03	1.07	1.12	1.16
Phosphotus	0.60	0.62	0.64	0.65	0.65
Lysine	1.16	1.15	1.13	1.11	1.04
Methionine	0.51	0.51	0.50	0.49	0.48
Fibre	3.91	3.87	3.80	3.66	3.44

Table 2: Finisher Feed ingredients

Ingredients	0%	2.50%	5.00%	7.50%	10.00%
Maize	50.00	49.00	47.00	45.00	44.00
Wheat offals	11.05	11.55	11.05	10.55	9.05
Soybean cake	18.00	18.00	18.00	18.00	18.00
Groundnut cake	15.00	13.00	13.00	13.00	13.00
Mango leaf meal	0.00	2.50	5.00	7.50	10.00
Bone meal	3.00	3.00	3.00	3.00	3.00
Limestone	1.00	1.00	1.00	1.00	1.00
Premix	0.25	0.25	0.25	0.25	0.25
Salt	0.25	0.25	0.25	0.25	0.25
Lysine	0.20	0.20	0.20	0.20	0.20
Methionine	0.25	0.25	0.25	0.25	0.25
Vegetable	1.00	1.00	1.00	1.00	1.00
Total					
Calculated nutrient					
Crude protein	20.71	20.24	20.17	20.21	20.21
Enery	2871.10	2850.90	2817.94	2796.20	2793.50
Calcium	1.55	1.60	1.65	1.69	1.75
Phosphotus	0.76	0.79	0.80	0.82	0.83
Lysine	1.13	1.10	1.09	1.08	1.07
Methionine	0.50	0.54	0.54	0.53	0.52
Fibre	3.86	3.80	3.70	3.69	3.60

Blood sample collection

Blood samples was collected into labeled tubes without anticoagulant for serum biochemical evaluation. 2mls of blood was collected from the jugular vein.

Experiment design

A completely randomized design was used.

Data Analysis

Data obtained was subjected to analyses of variance using SPSS statistical package version 25. Significant differences between treatment means were separated using Duncan's Multiple Range Test.

RESULTS

Table 2 shows the serum biochemical parameter of broiler chicken fed (MLM) mango leaf meal. The alkaline phosphate and alamine aminotransanase show no significant difference ($P>0.05$). But aspartate transaminase shows significant ($P<0.05$) different in broiler chicken fed 10.0% MLM (28.33 ui/L) followed by 7.5% and 2.5% (26.67 U/L and 27.33 U/L) respectively which falls within the reference normal range.

Total protein and glucose shows no significant different. Albumin has significant different ($P>0.05$) with broiler chickens on 7.5% MLM having the highest value followed by 10% MLM (36.00 and 27.37%) respectively.

Table 3 shows the lipid profile of broiler chicken fed mango leaf meal (MLM). There are no significant different in total cholesterol and triglyceride. High density lipoprotein show significant different in broiler chicken fed 7.5% MLM (2.43 mmol/L) followed by control and 5% (1.77 and 1.30 mmol/L) respectively. Also, there are significant different in low density lipoprotein (LDL). Broiler chicken fed control diet had the highest LDL (1.33 mmol/L) with the least low density lipoprotein in the treated groups. There is significant different in creatinine. Chicken fed 7.5% MLM (0.83 mg/L) had the highest creatinine followed by control and 2.5% respectively (0.57 and 0.40 mg/L).

Table 2: Serum biochemistry indices

	Treatment					
Parameters	**0%**	**2.5%**	**5%**	**7.5%**	**10%**	**SEM**
Alkaline Phosphate (Iμ/L)	14.33	13.00	9.33	10.00	11.33	0.97
Alanine aminotransaminase (U/L)	23.33	26.67	20.67	21.67	23.33	0.99
Aspatate Aminotransaminase (U/L)	19.67[b]	27.33[a]	18.33[b]	23.67[ab]	28.33[a]	1.31
Total protein (g/L)	42.10	42.23	34.13	41.33	41.83	1.31
Albumin (g/L)	20.63[b]	19.47[b]	22.43[b]	36.00[a]	27.37[a]	1.84
Glucose (mmol/L)	2.60	3.00	3.13	2.77	2.37	0.16

[a, b, c] means with different superscripts on the same row differ significantly (P<0.05).

Table 3: Lipid profit of broiler chickens fed mango leaf meal

	Treatment					
Parameters	**0%**	**2.5%**	**5%**	**7.5%**	**10%**	**SEM**
Total cholesterol	2.60	3.00	3.13	2.77	2.37	0.16
Triglyceride (mmol/L)	0.83	1.03	0.93	1.70	1.27	0.40
High density lipoprotein (mmol/L)	1.77[ab]	1.77[ab]	1.30[b]	2.43[a]	1.70[ab]	0.13
Low density lipoprotein (mmol/L)	1.33[a]	0.67[ab]	0.60[b]	0.87[ab]	0.90[ab]	0.10
Creatinine (mg/L)	0.57[ab]	0.40[b]	0.57[ab]	0.83[a]	0.37[b]	

[a, b, c] means with different superscripts on the same row differ significantly (P<0.05).

DISCUSSION

The physiological status and health of farm animals depends on the nutrition fed to the animal aside genetic and environment influence. The result obtained in this study was in agreement with the findings of Oloruntola, *et al*. 1999; Oloruntola, *et al*. 2016; Adeyeye *et al.*, 2017. The present result obtained in this study fall within the normal serum biochemistry indices range (Brunett *et al*., 2003). The result obtained could be due to the present of saponin and some flavonoids which promote the health status of those broiler chickens.

The result of haematological and serum analysis is usually used to assess the health status of an animal. Hematological and serum have been observed as good indicators of the physiological status of animal and their changes are important in assessing the response of such animal to various physiological situation (Khan and Zafen, 2005). The results obtained in this study as shown in Table 3 and 4 was in line with the report of Burk. J. (1994). The results obtained in this study is an indicator of high immunity and good resistance to disease which could be due to the present of the bioactive compound found in mango.

CONCLUSION

It could be concluded that 5.0% and 7.5% MLM could be added to broiler chicken diet without any advert effect on the health status of the chicken.

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