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Growth performance, blood profile and nutrients digestibility of broiler chickens fed *Enterolobium cyclocarpum* seed based diets with or without supplemental exogenous enzyme

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Abstract

A 63-day study using 150, seven day old broiler chicks was conducted to evaluate the effect of Enterolobium cyclocarpum seed meal (ECSM) based diets on growth performance, blood profile and nutrient digestibility in six dietary treatments containing 0, 5 and 10% ECSM with or without enzyme supplementation using 2×3 factorial layout in a completely randomized design. Results showed that the main and interaction effects of enzyme supplementation and inclusion level of ECSM did not significantly ($p>0.05$) influence the growth parameters studied. Enzyme supplementation significantly ($p<0.05$) increased glucose concentration. Birds fed 5% ECSM based diet recorded the highest globulin value (1.96g/dL). The albumin, globulin and glucose concentration significantly influenced by the interaction effect of enzyme supplementation and ECSM inclusion levels. Birds fed 5% ECSM based diet supplemented with enzymes recorded the highest globulin value (2.02g/dL). Birds fed ECSM based diet supplemented with enzyme had lower (62.22%) lymphocytes value. Interactive effect of ECSM and enzyme supplementation had no influence ($p>0.05$) on the haematological indices of broiler chicken except the white blood cell and lymphocytes values. The white blood cell and lymphocytes values increased across the dietary treatments as the ECSM supplemented with or without enzyme increased. Main and interactive effects of enzyme supplementation and ECSM inclusion levels significantly ($p<0.05$) affected the nutrient digestibility. Birds fed diet supplemented with enzyme and those fed 5% ECSM based diet had better nutrient digestibility values. The study concluded that ECSM could be used up to 5% supplemented with enzymes in broiler chickens' diet without any adverse effect on broiler's performance.

***Keywords:** Broiler, Serum biochemistry, haematological indices, Enterolobium cyclocarpum, Nutrient digestibility, Enzymes*

Description of Problem

Globally, there are problems related to monogastrics feeding in terms of matching the available feed resources with their nutrient requirements and this has been a major concern, and part of effort to finding solution to this problem is the use of tropical trees and shrub legumes plant. Tropical trees and shrubs have great potentials to serve as feed resources for ruminants, they are less susceptible to climatic fluctuations, and they produce seeds high in protein (1) content but they have been found to contain anti-nutritional factors which tend to affect both their intake and digestibility (2). *Enterolobium cyclocarpum* is a legume tree which belongs to the family mimosadeae (3). The legume is easily established and fast growing to maturity over a short period of time than the most common legume plants in Nigeria and can be used in intensive feed garden in some parts of Nigeria (1). Also, as a leguminous multipurpose plant, it has the potential of fixing atmospheric nitrogen into the soil and can also be exploited for feeding of animals (4). Supplementation of diets of monogastric animals with exogenous enzymes has been increasingly investigated and applied during the past decade as a means of enhancing and increasing the effectiveness of nutrient utilization (5). Poultry production has

an unquestionable propensity to close the existing gap in animal protein consumption in Nigeria. According to (6) this ability is because of their short generation intervals, large number, fast growth, greater affordability, easy raising, absence of taboo to production and consumption and absence of barrier to production in any climatic zone in the country. This isreducing drastically as feed which accounts for about 70-80% production cost is under serious threats as there is strong competition between humans and animals, and a continuous rise in the cost of these feed ingredients. As a result of this alternative, nutritive and cheap source of feed ingredients need to be sourced for, in poultry production. Poultry enjoys a relative advantage over other livestock in terms of its ease of management, high turnover, quick return to capital investment and wide acceptance of its product for human consumption (7, 8). Study of blood parameters play a vital role in the assessment of physiological, pathological and nutritional status of an organism. This provides the opportunity to evaluate the presence of several metabolites and other constituents in the body of animals (9) Changes in the blood constituent when compared to normal values could serve as a reflector of the metabolic stage of an animal as well as quality of feed (10). These can be used to determine systemic relationships and physiological adaptations in the body of animals exposed to toxicants and stresses due to environmental, nutritional and or pathological factors (11, 12). This is very important because the potential value of non-conventional feed ingredients (NCF) depend on their nutritive value, availability and safety to animal health (13). Hence, this study was aimed at evaluating the effect of graded levels of *Enterolobium cyclocarpum* seed meal on growth performance, nutrient digestibility and blood chemistry of broiler chickens with and without enzyme supplementation.

Materials and Methods

Experimental site

The experiment was conducted at the Teaching and Research Farm of the Federal College of Animal Health and Production Technology Moor Plantation Ibadan. The area lies within the rainforest ecological zone, and falls within longitude and latitude 7^0 27^1 and $3^0 25^1$ respectively at altitude 200-300m above the sea level with an annual rainfall of about 1250mm. The temperature and relative humidity of the area ranged from 30-35^{0}C and 76-84%, respectively (14). The experiment lasted for a period of nine weeks.

Processing of Enterolobium cyclocarpum seed meal

Enterolobium cyclocarpum pods were sourced for around Ibadan metropolis. They were de-husked and the seeds were air dried for three (3) days before they were toasted using the procedure of (15). After toasting the endocarp of the seeds were separated manually from the epicarp. The endocarp was ground using a commercial hammer mill and included in the feed of broiler chicken at various inclusion levels.

Experimental Animals and their Management

One day old arbor acre broiler chicks (n=150) from the College Hatchery, were brooded for a week after which they were randomly allotted into six dietary treatments with three replicates consisting of eight birds per replicate. The seven day old chicks were weighed at the beginning of the experimental phase to determine their initial weights and subsequently weighed on weekly basis until completion of the experiment. Feed and water were supplied *ad libitum* to the birds throughout the experimental period. Prophylactic measures such as medication and vaccination along with routine management practices were strictly adhered to. Diets were

formulated to contain 0, 5 and 10% *Enterolobium cyclocarpum* Seed meal as partial replacement for full fat soya. The first diet (T_1) had 0% inclusion of *Enterolobium cyclocarpum* seed meal (ECSM) and this served as control, treatment two (T_2) contained 5% ECSM, treatment three(T_3) contained 10% ECSM, treatment four, five and six (T_4, T_5 and T_6) contained ECSM at 0, 5 and 10% respectively but also with supplemental enzymes. The experiment was a 2x3 factorial arrangement in a completely randomized design.

Chemical Analysis

Samples of ECSM, feed and faeces were oven dried, sieved through a 2mm sieve and stored in an airtight container for proximate analysis using the method of (16).

Parameters measured

Data collected wereas follow:

Feed consumption: This was obtained by weighing the quantity of feed offered and left over the next morning to ascertain the quantity of feed consumed.

Body weight gain: All chicks in each replicate were weighed at the end of every week during the experiment before feed and water were given and average weight of each replicate was determined by dividing the total weight of the chicks by the number of the chicks in the replicate.

Feed conversion ratio (FCR): This was computed by dividing the daily feed intake by daily weight gain

$$FCR = \frac{Feed\ intake\ (g)}{Body\ Weight\ gain\ (g)}$$

Blood Sample

At the 9th week of the experiment two birds per replicate were randomly selected and 5mL of blood was collected from the wing web with the use of a syringe and2.5mLwas put into plain bottles for serum biochemical determinations such as total protein, albumin, cholesterol, creatinine and urea. Other portion was poured into bottles containing anti-coagulant for hematological analysis such as red blood cells (RBC), white blood cells (WBC), haemoglobin (Hb) and packed cell volume (PCV) (17)

Determination of Apparent Nutrient Digestibility

At week eight of the experiment, two birds per replicate were randomly selected and placed in metabolic cages which have been cleaned and disinfected. They were left to acclimatize for two days after which the feed samples based on each treatment was given the birds and faecal samples were collected for a period of five days. The faecal samples were weighed and oven dried and they were packed together according to treatment for further analysis following standard procedures. Percentage Digestibility was calculated using the formula;

$$Digestibility\ (\%) = \frac{\text{Nutrient intake(CP in feed)} - \text{Nutrient in feaces(CP in faeces)}}{\text{Nutrient intake}} \times 100$$

Statistical Analysis

The data were subjected to a one way analysis of variance and means were separated using Duncan Multiple Range test at ($p< 0.05$) (18).

Results and Discussion

Main and interactive effects of enzyme supplementation and ECSM inclusion levels on the growth performance of broiler chickens is indicated in Table 2 and 3 respectively. There were no significant differences ($p>0.05$) in all growth parameters measured across the treatment means considering both the main and interaction effects. It was evident from the results of this study that the inclusion levels of ECSM and enzyme supplementation did not influence the growth parameters, which was in

line with report of (19) that the growth performance of broiler chickens were not significantly affected by dietary levels of toasted sorrel seed meal

Table 1: Gross composition (%) of Broiler Starter and Finisher Diets

Ingredient	Starter (%)	Finisher (%)
Maize	50.00	50.00
Full fat soya	25.00	30.00
ECSM	0.00	0.00
Fish meal (72%)	3.00	3.00
GNC	9.40	3.30
Wheat offal	8.30	5.00
Salt	0.25	0.25
Premix	0.25	0.10
Lysine	0.20	0.25
Limestone	1.50	1.00
Methionine	0.10	0.10
Bone meal	2.00	2.00
Roxazyme G2G	-	-
Total	100.00	100.00
Calculated analysis		
Crude Protein (%)	23.14	20.79
ME Kcal/Kg	2833.20	3140

Table 2: Main effect of enzyme supplementation and *Enterolobium cyclocarpum* seed meal inclusion levels on the growth performance of broiler chickens

Parameters	Enzyme			Inclusion levels of ECSM			
	-	+	SEM	0%	5%	10%	SEM
Initial weight (g/b)	117.63	116.59	5.48	117.61	116.41	117.32	6.71
Final weight (g/b)	1990.00	1941.00	32.99	2003	1915	1979	63.90
Total Weight gain (g/b)	1873	1824	53.21	1885	1799	1862	65.17
Average weight gain (g/b/d)	29.73	28.96	0.85	29.92	28.55	29.55	1.03
Feed intake (g/b)	2953	2948	68.08	2977	2922	2953	83.36
Average daily feed intake (g/b/d)	46.88	46/80	1.80	47.25	46.38	46.88	1.32
Feed Conversion ratio	1.58	1.63	0.05	1.59	1.64	1.59	0.06

ECSM: Enterolobium cyclocarpum seed meal; + Enzyme inclusion; - No inclusion of enzymes;
SEM Standard error of mean;g/b/d: gram per bird per day.

Table 3: Interaction effect of enzyme supplementation and *Enterolobium cyclocapum* seed meal inclusion levels on the growth performance of broiler chickens

Parameters	ECSM Without Enzyme			ECSM with Enzyme			
	0%	5%	10%	0%	5%	10%	SEM
Initial weight (g/b)	115.88	118.32	118.71	119.34	114.50	115.92	9.49
Final weight (g/b)	2053.00	2030.00	1888.00	1952.00	1801.00	2070.00	91.78
Total Weight gain (g/b)	1937.00	1912.00	1769.00	1833.00	1686.00	1954.00	92.16
Average weight gain (g/b/d)	30.75	30.34	28.08	29.09	26.77	31.01	1.46
Feed intake (g/b)	2953.00	3009.00	2898.00	3001.00	2835.00	3009.00	11.70
Average daily feed intake (g/b/d)	46.87	47.76	46.00	47.64	45.00	47.70	1.87
Feed Conversion ratio	1.53	1.57	1.84	1.65	1.70	1.54	0.08

ECSM: *Enterolobium cyclocarpum* seed meal.

The Main effects of Enzyme supplementation and ECSM inclusion levels on Serum biochemical indices was shown in Table 4. There were no significant differences ($p > 0.05$) in most of the parameters among dietary treatments except the glucose, globulin and albumin. The albumin value observed decreased across the dietary treatments as ECSM inclusion levels increased. This could be as a result of mal-absorption or possible dietary deficiency of protein which could be locked up in the diets indicating the presence of anti- nutritional factors (20). While for enzyme inclusion, there was no significant difference but the treatments without enzymes had higher values than those with enzyme. Globulin values were observed to increase with the inclusion of enzyme and also a considerable increase with 5% inclusion and a decrease with 10% inclusion of ECSM. Increase in globulin values at 5% could also be as a result of unavailability of locked up protein by anti- nutritional factors. The values of glucose were observed to vary significantly with the enzyme supplementation from 140.11 to164.97 mmol/L and no significant difference was noticed for the inclusion of ECSM.

Interactive effect of enzyme supplementation and ECSM inclusion levels on Serum biochemical indices is represented in Table 5, it showed no significant differences ($p >0.05$) among the dietary treatments except Albumin, Globulin and Glucose. Albumin values were observed to decrease across the dietary treatments. The decrease in albumin levels across treatments could also be attributed to unavailability of protein from the test ingredients due to the presence of anti - nutritional factors. The presence of enzymes did little or nothing to the availability of proteins to the birds. The globulin and glucose values obtained in this study did not follow a particular trend.

The main effect of enzymes supplementation and ECSM inclusion levels on haematological parameters is shown in Table 6. There were no significant ($p>0.05$) differences among treatments except on lymphocytes. Lymphocytes were only significant for enzyme supplementation in the main effects, and the values were lower than the physiological values as recommended by (21) and the results are also in contrast with the work of (22) which showed that lymphocyte values increased with the age of birds.

The interactive effects of enzyme supplementation and ECSM inclusion levels on haematological parameters of Broiler chicken is represented in Table 7. It showed that there were no significant ($p>0.05$) differences among parameters except on white blood cell (WBC) and lymphocytes. There was an increase in WBC counts among broiler chicken fed ECSM based diet without enzyme

supplement but those fed ECSM based diet supplemented with enzyme showed no statistical variation. All values obtained for the white blood cells in this experiment were far less than the normal physiological values of (22).

Table 4: Main effect of Enzyme supplementation and *Enterolobium cyclocarpum* inclusion levels on the serum biochemical indices of broiler chicken

Parameters (%)	Enzyme			Inclusion levels of ECSM			
	-	+	SEM	0%	5%	10%	SEM
Total Protein (g/dL)	3.52	3.85	0.22	3.68	3.97	3.40	0.26
Albumin (g/dL)	2.14	2.05	0.11	2.37^{a}	2.02^{ab}	1.91^{b}	0.13
Globulin (g/dL)	1.37	1.80	0.16	1.31^{b}	1.96^{a}	1.49^{ab}	0.19
Glucose (mmol/L)	140.11^{b}	164.79^{a}	7.64	165.04	143.76	140.55	9.35
Cholesterol (mmol/L)	122.12	127.68	11.68	117.40	129.13	128.17	14.30
Creatinnine (mg/dL)	1.07	1.19	0.09	1.20	1.20	1.09	0.11
Urea (mmol/L)	4.12	3.87	0.68	3.94	4.13	3.92	0.84
AST (iu/L)	129.40	125.50	2.65	30.88	24.75	26.72	3.14
ALT (iu/L)	38.45	41.40	2.74	35.58	42.46	41.74	3.35

^{a,b,c}Mean along the same row with different superscripts are significantly different($p< 0.05$)
ECSM –*Enterolobium cyclocarpum* seed meal; SEM± - Standard error of mean, ALT - Alanine amino transferase, AST – Aspartate amino transferase

Table 5: Interaction effect of enzyme supplementation and *Enterolobium cyclocarpum* inclusion levels on the serum biochemical indices of broiler chicken

Parameters	ECSM Without Enzyme			ECSM with Enzyme			
	0%	5%	10%	0%	5%	10%	SEM
Total Protein (g/dL)	3.62	3.90	3.04	3.74	4.05	3.40	0.37
Albumin (g/dL)	2.54^{a}	2.00^{ab}	1.90^{b}	2.20^{a}	2.03^{ab}	1.91^{b}	0.18
Globulin (g/dL)	1.09^{ab}	1.90^{ab}	1.14^{ab}	1.54^{b}	2.02^{a}	1.49^{ab}	0.27
Glucose (mmol/L)	152.34^{ab}	130.80^{ab}	137.19^{ab}	177.73^{a}	156.72^{ab}	140.55^{ab}	13.22
Cholesterol (mmol/L)	119.68	180.49	146.19	115.12	157.76	128.17	20.22
Creatinine (mg/dL)	1.14	1.11	0.96	1.09	1.28	1.09	0.15
Urea (mmol/L)	4.11	4.09	4.15	3.77	4.16	3.92	1.18
AST (iu/L)	33.19	24.94	3.06	2.58	24.55	26.72	4.44
ALT (iu/L)	32.37	41.59	41.40	35.78	43.34	41.74	4.74

^{a,b,c}Mean along the same row with different superscripts are significantly different ($P< 0.05$)
ECSM –Enterolobium cyclocarpum seed meal; SEM- Standard error mean; ALT - Alanine amino transferase; Gluc – Glucose; AST – Aspartate amino transferase;

Table 6: Main effect of enzyme supplementation and *Enterolobium cyclocarpum* inclusion levels on the haematological indices of broiler chicken

Parameters (%)	Enzyme			Inclusion levels of ECSM			
	-	+	SEM	0%	5%	10%	SEM
PCV (%)	27.33	27.00	1.07	26.50	28.67	26.33	1.31
Haemoglobin (%)	8.94	8.83	0.34	8.58	9.30	8.78	0.41
Red blood cell (10^6/mm^3)	2.99	2.77	0.22	2.88	3.06	2.70	0.27
WBC (10^4/mm^3)	1.26	1.08	0.11	1.08	1.03	1.40	0.14
Platelet (10^4×mm^3)	2.00	2.02	0.23	2.18	1.95	1.91	0.28
Lymphocyte (%)	68.00^a	62.22^b	1.70	64.33	66.33	64.67	2.08
Heterophil (%)	23.78	31.00	2.78	28.83	32.33	30.00	3.40
Monocytes (%)	2.56	3.33	0.34	3.50	2.50	2.83	0.42
Eosinophils (%)	3.22	3.33	0.47	3.00	2.83	4.00	0.58
Basophils (%)	0.22	0.11	0.14	0.33	0.00	0.17	0.10
MCV (fl)	93.76	90.34	0.39	95.01	80.82	100.32	1.27
MCH (g/dL)	30.72	32.90	4.17	30.92	31.14	33.44	2.15
MCHC (pg)	32.43	33.09	0.53	32.47	32.96	32.86	0.66

^{a,b,c}: mean along the same row with different superscripts are significantly different($P < 0.05$) - : Non enzyme inclusion; +:Enzyme Inclusion; PCV: Packed cell volume; WBC: White blood cell HB: Haemoglobin; HET: Heterophils; PLT: Platelet; MON: Monocytes; RBC: Red blood cell; LYMP: lymphocytes

Table 7: Interaction effect of enzyme supplementation and *Enterolobium cyclocarpum* inclusion levels on the haematological indices of broiler chicken

Parameters (%)	Enzyme without Enzyme			ECSM with Enzyme			
	0%	5%	10%	0%	5%	10%	SEM
PCV (%)	28.67	27.30	26.00	24.33	30.00	26.67	1.85
Haemoglobin (%)	9.20	8.90	8.73	7.97	9.70	8.83	0.58
Red blood cell (10^6/mm^3)	3.32	2.98	2.65	2.44	3.13	2.75	0.38
WBC (10^4/mm^3)	1.04^{ab}	1.33^{ab}	1.40^a	1.12^{ab}	0.73^b	1.39^{ab}	0.20
Platelets (10^4×mm^3)	1.97	2.17	1.88	2.38	1.72	1.94	0.40
Lymphocyte (%)	66.33^{ab}	67.33^{ab}	70.33^{ab}	62.33^a	65.33^{ab}	59.00^b	2.94
Heterophil (%)	27.67	18.33	25.33	30.00	28.33	34.60	1.81
Monocytes (%)	3.00	2.00	2.67	4.00	3.00	3.00	0.59
Eosinophils (%)	2.67	2.33	4.67	3.33	3.33	3.30	0.82
Basophils (%)	0.33	0.00	0.33	0.33	0.00	0.00	0.24
MCV (fl)	86.30	93.80	101.17	103.72	67.84	99.48	4.53
MCH (g/dL)	27.71	30.64	33.82	34.13	31.63	33.05	3.05
MCHC (pg)	32.14	32.60	32.56	32.81	33.32	33.16	0.93

^{a,b,c}: mean along the same row with different superscripts are significantly different($P < 0.05$)- : Non enzyme inclusion; +: Enzyme Inclusion; PVC: Packed cell volume, WBC: White blood cell, MCHC: Mean corpuscular haemoglobin concentration; MCV: Mean cell volume; MCH: Mean cell haemoglobin;

The main effect of enzymes supplementation and ECSM inclusion levels on nutrient digestibility of broiler chicken is indicated in Table 8. There were significant differences ($p < 0.05$) in all the parameters across the treatment groups except the ether extract and ash. Birds fed ECSM based diet with enzyme supplementation showed an increase in dry matter (72.63%), crude protein (78.73%) and crude fibre (71.57%). These higher values obtained could be attributed to the influence of enzyme supplementation on the anti-nutritional factors in ECSM. The result obtained in this study was similar with the report of (23) that suggested that supplementation of poultry diets with exogenous enzyme may be an optional and effective strategy in utilizing the nutrients in feed for non-ruminant animals. Birds fed 5 and 10 % ECSM based diet had improved digestibility values. This corroborates with the result reported by (24) which stated that heat treatment of full fat soya inactivates the anti-nutritional factors and enhance nutrient digestibility. The increase in the level of *Enterolobium cyclocarpum* in the broiler diet significantly affects the apparent nutrient digestibility coefficient of dry matter, crude protein and Nitrogen free extract.

Interactive effect of enzymes supplementation and ECSM inclusion levels on nutrient digestibility of broiler chicken is presented in Table 9. There was significant difference ($p < 0.05$) in all the parameters across the treatments except for ash. However, the result indicated birds fed 10% ECSM based diet supplemented with enzyme had the highest dry matter (75.35%), crude protein (83.70%) and crude fibre (75.32%), nitrogen free extract (85.03%) digestibility values.

In summary, as there is paucity of information on the use of *Enterolobium cyclocarpum* seed meal in diets of poultry, the result indicated that birds fed 5% ECSM with enzymes supplementation were able to absorb, digest and utilize the nutrient in the feed more than the others. The effect of energy availability is likely as a result of increased improvement in protein (25) Starch and fat (26).

Table 8: Main effect of enzyme supplementation and inclusion levels of *Enterolobium cyclocarpum* seed meal on the Nutrient digestibility of broiler chicken

Parameters (%)	Enzyme			Inclusion levels of ECSM			
	-	+	SEM	0%	5%	10%	SEM
Dry matter	62.57^{b}	72.63^{a}	1.47	61.54^{b}	70.77^{a}	70.49^{a}	1.80
Crude Protein	67.36^{b}	78.73^{a}	1.22	62.26^{b}	76.79^{a}	80.08^{a}	1.49
Crude fibre	56.49^{b}	71.57^{a}	2.29	61.24^{b}	68.41^{ab}	62.44^{a}	2.80
Ether extract	71.07	79.68	4.07	67.32	72.44	86.36	4.98
Ash	63.01	69.03	3.45	59.77	70.20	68.23	4.22
Nitrogen free extract	76.34	80.44	1.23	78.01^{ab}	81.30^{a}	76.01^{b}	1.51

^{a,b}means with the same superscript along the row were not significantly differently ($p < 0.05$), ECSM: *Enterolobium cyclocarpum* seed meal; SEM: Standard Error Mean, - *Enterolobium cyclocarpum* without enzyme; + *Enterolobium cyclocarpum* with enzyme.

Table 9: Interaction effect of enzyme supplementation and *Enterolobium cyclocapum* seed meal inclusion levels on the Nutrient digestibility of broiler chicken

Parameters	ECSM without enzyme			ECSM with enzyme			
	0%	5%	10%	0%	5%	10%	SEM
Dry matter	51.79^{c}	70.28^{ab}	65.63^{b}	71.29^{ab}	71.25^{ab}	75.35^{a}	2.54
Crude protein	50.81^{b}	66.75^{a}	76.47^{b}	73.71^{b}	78.77^{ab}	83.70^{a}	2.10
Crude fibre	53.17^{b}	66.75^{a}	49.55^{b}	69.31^{a}	70.07^{a}	75.32^{a}	3.96
Ether extract	62.20^{b}	63.14^{b}	87.85^{a}	72.43^{ab}	81.74^{ab}	84.86^{ab}	7.05
Ash	59.93	70.04	59.34	59.60	70.37	77.13	5.97
Nitrogen free extract	82.86^{a}	79.97^{ab}	66.99^{c}	73.95^{b}	82.63^{a}	85.03^{a}	2.13

^{a,b} means with the same superscript along the row were not significantly differently ($p < 0.05$),SEM: Standard Error Mean, ECSM: *Enterolobium cyclocarpum* seed meal

Conclusion and Applications

Based on the results obtained in this study, it can be concluded that:

1. Inclusion of *Enterolobium cyclocarpum* seed meal did not have any significant effect on the growth performance of broiler chickens.
2. *Enterolobium cyclocarpum* seed meal with or without enzyme supplementation had significant effects on white blood cell, lymphocytes, Albumin, Globulin and Glucose of broiler chicken.
3. Supplementation of enzyme to *Enterolobium cyclocarpum* seed meal based diet significantly influenced crude protein, crude fibre and nitrogen free extract in the nutrient digestibility of broiler chickens.
4. *Enterolobium cyclocarpum* seed meal can be included in broiler chicken's diet up to 5% as it presented better results in terms of nutrient digested.

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