IOSR Journal of Agriculture and Veterinary Science (IOSR-JAVS)
e-ISSN: 2319-2380, p-ISSN: 2319-2372. Volume 9, Issue 10 Ver. II (Oct. 2016), PP 48-53
www.iosrjournals.org

Haematology and Serum Biochemistry of Broiler Chickens Fed Graded Levels of Baobab (*Adansonia digitata* L.) Seed Meal

H. Abdulazeez[1], S.B. Adamu[2], J. U. Igwebuike[2],G. J. Gwayo[1]and A.I. Muhammad[3].

[1]*Department of Agricultural Education, Umar Suleiman College of Education. P.M.B. 02, Gashua, Yobe State, Nigeria.*
[2]*Department of Animal Science, Faculty of Agriculture, University of Maiduguri, P.M.B. 1056, Borno State, Nigeria.*
[3]*Department of Animal Science, Federal University Dutse, P.M.B. 7156, Jigawa State, Nigeria..*

Abstract: *Eight weeks experiment was conducted to investigate the effect of replacing soyabean meal with Baobab seed meal on hematology and serum indices of broiler chickens. Two hundred and twenty five (225) broiler chicks were randomly assigned to five dietary treatments for the starter and finisher phases. At each phase, 0, 25, 50, 75 and 100% of the soya bean in the diets were replaced with Baobab seed meal (BSM); Each treatment was replicated thrice with 15 birds per replicate in a Completely Randomized Design (CRD). Significant differences (P<0.05) existed in all the hematological indices investigated with the exception of MCHC. Packed cell volume (PCV), haemoglobin (Hb) concentration and Red blood corpuscles (RBC) values for birds on 50% BSM were significantly (p < 0.05) higher than the other groups. Similarly, birds on BSM groups recorded superior white blood corpuscles (WBC) values. Blood glucose tended to significantly (p < 0.05)decrease with increasing level of BSM. Other serum biochemical indices showed no significant difference (P>0.05) but were all within normal range The study concludedthat BSM can replace upto100% of soyabean in broiler chickensdiet with no adverse effect on haematological and serum biochemical parameters.*

Keywords: *Baobab seed, broiler chickens,heamatology, serum biochemistry.*

I. Introduction

Research on non-conventional feed ingredients (NCF) for poultry has been ongoing over the past decades. Such studies are aimed at findinglow-cost, readily available feed ingredients that have less direct nutritional significance to man as a way of addressing the exorbitant hike in the cost of feed ingredients for poultry. This is because feed cost accounts for about 70% of the total cost of poultry production and is thereby considered a major determinant of the profitability, sustainability and development of the poultry enterprise [1, 2, 3]. Many non-conventional feedstuffs (NCF) have been explored; Research emphasis are now on the potentials of lesser-known, ignored and under-exploited trees and shrubs that are native to Africa [4, 5] as protein and energy source; baobab (*Adansonia digitata* L.) belongs to such category.

The baobab (*Adansonia digitata L.)* is a symbolic tree that is found throughout Africa, generally at low altitudes and in the hotter, drier areas.In Nigeria it is widely spread in the savannah regions [6, 7]. Baobab leaves and fruit (pulp)are widely utilized for food; the root and bark are respectively used for fibre and ethno-veterinary practices [8]. Baobab seed are however not widely utilized, the hard pericarp of the seeds seems to have limited its respective use as food and feed ingredient for humans and other livestock species, as such greater percentage of it is wasted [9]. Baobab seeds are rich in protein (20-36 % CP) and energy (1898- 4465 kcal/kg) and also provide some necessary fibre, vitamins (vitamin C), and minerals (Calcium and Iron) [10]. It also contains many anti-nutritional factors such as oxalates, phytate, saponins and tannins [11, 12].

Studies of blood constituents play vital role in assessing the physiological, pathological and nutritional status of an organism; it provides the opportunity to evaluate the presence of several metabolites and other constituents in the body of animals [13]. Changes in the constituent compounds of blood when compared to normal values could serve as a reflector of the metabolic stage of an animal as well as quality of feed [14]. They are thus, 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 [15, 16]. 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 [3].

Some authors [2, 17,18] had hinted on the potential use of baobab seed as protein supplement for poultry. However, studies on the effect of baobab seed on hematological and biochemical indices of broiler chickens are scarce in literature. This study therefore is aimed at investigating the effect of baobab seed on hematological and biochemical indices of broiler chickens.

II. Materials And Methods

2.1 Study Area

This study was conducted at the poultry unit of the Teaching and Research Farm of the Department of Agricultural Education, Umar Suleiman College of Education Gashua, Yobe State, Nigeria. Gashua is located between Latitude $12.52^0 - 13^0$N, Longitude $11.24^0 - 11.30^0$E. The mean temperature ranges from 38 - 40^0C. [19].

2.2 Experimental birds and their management

A total of two hundred and twenty-five (225) broiler chicks were used for the experiment. On arrival, the chicks were brooded for one week usingkerosene stove as a source of heat after which they were individually weighed and randomly assigned to various dietary groups. The birds were also vaccinated with Gumboro vaccines at the age of two weeks, Newcastle disease vaccine (lasota) at three weeks, and a second dose of Gumboru disease vaccine (booster) at five weeks. Similarly all the necessary routine husbandry management practices were duly observed.

2.3Experimental diets and design

Baobab seed used for the experiment was purchased from a local market. The seed was washed, and sun dried after which it was milled to produce baobab seed meal (BSM), this was used to formulate five diets for the starter and finisher phases. At each phase, 0, 25, 50, 75 and 100% of the soya bean was replaced with baobab seed meal. These were designated as T1(0% BSM), T2(25% BSM), T3(50%BSM), T4(75% BSM), and T5(100% BSM), respectively. Two hundred and twenty five broiler chicks were randomly assigned to five dietary treatments. Each treatment was replicated thrice with 15 birds per replicate in a Completely Randomized Design (CRD). Feed and water were provided *ad libitum*. The composition and calculated analysis of the experimental diets for both starter and finisher stages are presented in Tables 1 and 2, respectively.

2.4 Blood sample collection and haematological indices

At the end of the eight weeks feeding trial, three birds were randomly selected from each replicate for haematological test. The birds were fasted overnight. Two samples were collected from each of the selected birds in the morning between 6 -7 am via punctured left wing veins. The samples for haematological parameters were collected in bottles containing ethylene diamine tetra – acetic acid (EDTA). The samples in the test tubes without anti-coagulant were centrifuged for ten minutes to separate the cell from the plasma for serum biochemical indices. Haematological parameters such as Red Blood Cells (RBC), White Blood Cell (WBC), Packed Cell Volume (PCV), Haemoglobin (Hb) concentration were determined according to [20].

2.5 Serum biochemical analysis

The total protein, albumin and globulin in the serum were analyzed with Sigma assay kits (Sigma Chemical Co. St. Louis, Missouri, USA). The serum urea estimation was carried out by the diacetyl monoxime, Serum cholesterol was determined by colorimetric enzyme method as outlined by [21]. The serum glucose was estimated by orthotoliudine method.

2.6 Statistical Analysis

All the data collected were subjected to analysis of variance using the Statistical Package for Social Sciences (22). Significant difference among treatment means were compared using Least Significant Difference (LSD) according to [23].

III. Results and Discussions

3.1 Haematological indices

The haematological parameters of broiler chickens fed graded levels of BSM are presented in Table 3. The results obtained in this study showed significant differences ($P<0.05$) in all the treatments for the haematological indices investigated with the exception of Mean corpuscular haemoglobin concentration (MCHC). However, all values fall within the normal rangefor healthy chickens as was reported by others [24, 25]. The packed cell volume (PCV) for birds on 50% BSM (36.06%) was significantly higher than the other groups (31.87–33.18%) which were statistically similar. Similarly, birds on 50% BSM had significantly higher haemoglobin concentration (Hb) (12.43 g/dl) values than T2 (25%BSM) and T4 (75%BSM). The value is however statistically similar to 11.81 and 11.68 g/dl obtained for birds on 0 and 100% BSM levels. PCV and Hb concentration are generally affected by inadequate intake of energy and protein with lower values which indicating anaemia (26, 27, 28). The result obtained in this study suggests the nutritional adequacy of the test material.Red blood cell (RBC) counts for birds on 50% BSM ($2.62 \times 10^6/mm^3$) was higher ($p< 0.05$) than the values obtained for birds on 0($2.34 \times 10^6/mm^3$) and 25% ($2.36 \times 10^6/mm^3$) BSM groups. The value is however, statistically similar to 2.42 and $2.59 \times 10^6/mm^3$ obtained for birds on 75 and 100% BSM levels. The values

follow the same trend as the MCV and Hb. Similarly, Mean corpuscular volume (MCV) values for birds on 25% (135.50 fl), 50 (136.23 fl) and 75% BSM (134.18 fl) levels were statistically similar and significantly vary from both the control diet (0%) which recorded the highest (141.12 fl), and 100% BSM level which recorded the least (128.48fl) value.

Birds on the control group had the highest($p < 0.05$)mean corpuscular haemoglobin (MCH) value of 50.45pg. The groups on BSM were statistically similar and significantly lower than the control. Furthermore, MCH follow the same pattern as MCV (decrease with increase in BSM level) with the least (45.76 pg) value recorded for birds on 100% BSM level. Since MCH is an indicator of the blood carrying ability of the RBC, this could suggest that the birds on the control group may be more efficient in performing respiratory function as observed by [29].White blood cell (WBC) counts for the treatment groups also showed significant difference. The highest value (172.71 $x10^3/mm^3$) was recorded for birds on 25%BSM level. This value is statistically similar to the values (162.87-169.92 $x10^3/mm^3$l) recorded for 50, 75 and 100% BSM groups. The control had the least (158.25 $x10^3/mm^3$) value. Since WBC are known to fight against diseases, the result of this study indicate that birds on BSM-based diets have similar immunity status which is superior to those of the control group. Thus, animals with low white blood cell count are exposed to high risk of disease infection, while those with high counts are capable of generating antibodies in the process of phagocytocis and have higher degree of resistance to diseases[29].The significant differences in the blood parameters observed in this study correspond with findings of [30, 31 and32] who respectively reported significant differences in blood parameters of layers, guinea fowl and rabbits fed baobab seed based diets. It is however, at variance with the report of [5, 9]who reported no significant difference among all the haematological parameters with respect to baobab seed inclusion on albino rats.

3.2 Serum biochemical indices

The values for the serum biochemical indices are presented in Table 4. With the exception of glucose, no significant differences ($P<0.05$) were observed for all the biochemical indices measured in this study. However, all values fall within the normal rangefor healthy chickens as was reported by others [24, 25].

The glucose values obtained in this study (5.93 – 6.85 mmol/l) were significantly ($P<0.05$) different among the treatment groups. Values for birds on 0 and 25% BSM levels were statistically similar and significantly ($P<0.05$) higher from values obtained for birds on 100% BSM levels which recorded the least (5.93 mmol/l) value. Values for 50 and 75% BSM levels were similar to both the control (0%) and 100% BSM level. However the trend seemed to decrease with increase in BSM level. The glucose values (5.93 – 6.85mmol/l) obtained in this study are similar to 6.1-6.4 mmol/L obtained by [32] in rabbits fed baobab pulp and seed meal (BPSM).According to [33, 34] some plant proteins exhibit hypoglycemic or hyperglycemic effect in some experimental animals. In this regard baobab seeds may be said to lowered blood glucose level. This may perhaps be related to the low level of soluble carbohydrate (10.4% NFE) and high fibre (17.5% CF) found in baobab seed used in this study.

Lack of significant difference in most of blood serum biochemical indices reported in this study is consistent with the report of [5, 9, 31 and 32] who respectively reported no significant difference ($P<0.05$) among the serum metabolites in albino rats, guinea fowls andrabbits fed baobab seed diets. It should be noted that the non- significant difference between the treatment groups and the control suggests the nutritional adequacy and safety of the test material.

IV. Conclusion

On account of adequate haematocrit, serum metabolites and immune statuses,it is concluded from this study that baobab seed can be included in the diet of broiler chickens as a complete replacement for soyabean meal without deleterious effect on haematological and serum biochemical parameters of broiler chickens.

References

[1] J. O. Atteh, *Principles andPractices of Feed Manufacturing* (Adlek Printers, Ilorin, Kwara State, Nigeria, 2004). 30 - 36.

[2] J.Chimvuramahwe, J.P.Musara, L. C. Mujuru, T. Gadzirayi, W. Nyakudya, L. Jimu,C.A.T. Katsvanga, J.F. Mupangwa, and R. Chivheya. Effect of feeding graded levels of *Adansonia digitata* (baobab) seed cake on the performance of broilers. *Journal of Animal and Plant Sciences11, (3),* 2011, 1442-1449.

[3] O.O. Adejinmi, R.A. Hamzat, A.M. Raji, and O.O. Owosibo. Performance, Nutrient Digestibility and carcass characteristics of broilers fed cocoa pod husk-based diets. *Nigerian Journal of Animal Science.13,* 2011, 61 - 68.

[4] L.C. Igboeli, E.O.H. Addy, and L.C.Salami. Effect of some processing techniques on the Anti-nutrients contents of Baobab seed (*Adansonia digitata*). *Bioresource Technology,59,* 1997, 29-31.

[5] K.O.Yusuf, A.M. Bamgbose, A.O. Oso, A.O. Fafiolu,, and A.O. Oni.Nutritional evaluation of baobab (*Adansonia digitata*) seed meal with rats. *ASSET series A.8 (2),* 2008,226-231.

[6] G. E. Wickens. The use of the baobab (*A. digitata L)* in Africa, in: le Houerou, H. N. (ed.), *Browse in Africa*: *The current state of knowledge*, (ILCA, Addis Ababa, Ethiopia, 1980).

[7] FAO. Traditional Food Plants. *Food and Nutrition Paper, 42*.(Food and Agriculture Organization, Rome, Italy, 1988).

[8] Feedipedia.African Baobab*(Adansonia digitata). Feedipedia -Animal Feed Resources Information System.* Retrieved from:http://www.feedipedia.org/node/525 on 23/03/2013
[9] I.E. Ezeagu. Baobab (*Adansonia digitata L*.) seed protein utilization in young albino rats. II. Haematocrit, plasma and hepatic biochemical metabolites. *Animal Research International 2(2),* 2005a, 301 – 305.
[10] R.H.Glew, D.J. VanderJagt, C. Lockett, L.E. Grivetti, G.C. Smith, G.C. Pastuszyn, and M. Millson. Amino acid, fatty acid and mineral composition of 24 indigenous plants of Burkina Faso. *Journal of Food Composition and Analysis.10,* 1997, 205-217.
[11] M. A. Osman. Chemical and nutrient analysis of baobab (*Adansonia digitata*). Fruit and seed protein solubility. *Plant Foods for Human Nutrition* 59,2004,29–33.
[12] I.I. Nkafamiya, S.A. Osemeahon, D. Dahiru, and H.A. Umaru, Studies on the chemical composition and physico-chemical properties of the seeds of baobab (*Adasonia digitata). African Journal of Biotechnology.6*, 2007, 756- 759.
[13] N. NseAbasi, M. E. Etim, U.A.Williams and A.O. Edem. Haematological parameters and factors affecting their values. *Agricultural Science. 2,(1),* 2014, 37-47
[14] P. R. Wheater, H. G. Burkih and V. G.Daniel. *Functional Histology* (ELBS Churchill H.O Livingstone, Zambia 1987). 280 –320.
[15] K. D. Afolabi, A. O. Akinsoyinu, R. Olajide and S. B. Akinleye. Haematological parameters of the Nigerian local grower chickens fed varying dietary levels of palm kernel cake. *Proc 35th Annual Conference of Nigerian Society for Animal Production,* 2010, 247.
[16] L.A Saulawa, S.N. Ukachukwu, O.C Onwudike, M.G. Garba, and A. Aruwayo. Effect of quantitative replacement of baobab (*Adansonia digitata*) seed meal for soya beans meal in broiler finisher diet.*ASAN-NIAS Joint Annual Conference,* Abuja,Nigeria. 2012, 525-528.
[17] J.S. Bale, Y. P. Mancha, M. Sanusi, and U.D. Doma, Effect of graded levels of Baobab(*Adansonia digitata*) seed meal on the growth performance and production economic analysis of broiler chickens. *International Journal of Poultry Science.12 (5),* 2013, 273-276.
[18] L.A. Saulawa, S.N. Ukachukwu, O.C. Onwudike, M.G. Garba, and A. Aruwayo. Quantitative substitution of raw baobab (*adansonia digitata*) seed meal for soyabean meal in broiler starter diet.*International Journal of Poultry Science 13 (6)*, 2014, 335-339.
[19] Wikipedia (2015). Gashua Nigeria. *http:en.m.wikipedia.org/wiki/Gashua.* Retrieved on (24/4/2015)
[20] N. C. Jain. *Veterinary Haematology* 4th ed. (Lea and Febiger publishers,Philadelphia, USA, 1986).
[21] B. M. Bush. *Interpretation of laboratory Results for Small AnimalClinician* (Black well Scientific Publication, U.K, 1991). 32 – 37.
[22] SPSS. Statistical Package for Social Sciences Procedure. *Statistix* - Version 9.0. SPSS Inc, 2006.
[23] R. G. B. Steel and J. A. Torrie, *Principles and Procedure of Statistics: A biometrical approach* 2nd ed. Mc Graw Hill Book Co. New York,1980).
[24] B.M. Mitruka and H.M. Rawnsley. *Clinical, biochemical and haematological reference values in normal and experimental animals* (Mason publishing, USA, 1977).83: 134- 135
[25] Anon. *Guide to the care and use of experimental animals Vol. 1.* (Canadian council on animal care, Ottawa, Ontario, Canada, 1980). 85 – 90.
[26] M. H. Maxwel. The of Dietary Rapeseed meal on haematology and thrombocytes ulthastructure of the Adult fowls. *Avian Pathology,11,* 1982, 427.
[27] S. C. Rastogi. *Essentials of Animal Physiology* 4th Ed. (New age Int. Pub. Ansuri road, Daryanganj, 2007).
[28] N. O. Muhammad and O. B. Oloyede. Haematological parameters of broiler chicks fed *Aspergillus niger* fermented *Terminalia catappa* seed Meal-Based Diet, *Global Journal of Biotechnology and Biochemistry,4(2)*, 2009, 179 –183.
[29] K. O. Soetan, A.S. Akinrinde and T. O. Ajibade. Preliminary studies on the haematological parameters of cockerels fed raw and processed guinea corn (*Sorghum bicolor*), *Proc of 38th Annual Conference of Nigerian Society for Animal Production,* 2013, 49-52.
[30] F. E. Sola - Ojo, S. A. O. Bolu, and T. O. Usman. Performance evaluation of layers fed baobab (*Adansonia Digitata*) seed meal based diets, *Journal of Applied Agricultural Research, 3,* 2011, 113 – 122.
[31] O. I. Alli, K.L. Ayorinde and U.S Akwarandu.Effect of graded levels of baobab seed cake on haematology and biochemistry of grower guinea fowl, *Proc of36th Conference of Nigerian Society for AnimalProduction,* Abuja, Nigeria, 2011, 158-160.
[32] I. O. Oladunjoye, M. Akinlade and Z. Lawal. Performance, digestibility, carcass and blood profile of grower rabbits fed baobab (*Adansonia digitata*) pulp and seed meal. *Indian Journal of Fundamental and Applied Life Sciences 4 (2),* 2014, 2231-6345.
[33] N. R. Yadav, U. R. Bharadwaj, S. R. Pande and V. S. Rajwansi. Biochemical studies on Indian wild legumes, 10: Effect of *Acacia melanoxylon, Albizzia moluccana and Leucaena glauca* seed diets on blood sugar and total cholesterol levels in normal young rats, *Indian Journal of Medical Sciences, 26,* 1973, 729 - 732.
[34] I. E. Ezeagu. Baobab (*Adansonia digitata L*) seed protein utilization in young albino rats. I. Biochemical ingredients and performance characteristics, *Animal Research International,2(1),* 2005b, 240 – 245.
[35] U. Pauzenga. *Feeding parent stock*.(Zootechnica International,1985). 22-24.

Table 1: Composition and calculated analysis of the experimental starter diets

Percent of full-fat soyabean replaced with baobab seed meal					
Ingredients (%)	T1(0)	T2(25)	T3(50)	T4(75)	T5(100)
Maize	50.30	50.30 50.30	50.30	50.30	
Full-fat soya bean	31.00	23.25 15.50	07.75	00.00	
Baobab seed meal	00.00	07.75 15.5	23.25	31.00	
Wheat offal	10.00	10.00	10.00	10.00	10.00
Fish meal	05.00	05.00	05.00	05.00	05.00
Bone meal	03.00	03.00	03.00	03.00	03.00
Common salt					
(NaCl)	00.25	00.25	00.25	00.25	00.25
Min-vit-premix*	00.25	00.25	00.25	00.25	00.25
Methionine	00.10	00.10	00.10	00.10	00.10
Lysine	00.10	00.10	00.10	00.10	00.10
Total	100.00	100.00	100.00	100.00	100.00
Calculated analysis					
Crude protein (%)	23.00	23.28	23.54	23.82	24.09
Crude fibre (%)	04.28	05.13	05.96	06.83	07.68
Ether extract (%)	04.71	08.62	08.74	08.87	08.98

Methionine (%)	00.43	00.39	00.49	00.46	00.42
Lysine (%)	01.23	01.33	01.41	01.48	01.56
Calcium (%)	01.31	01.31	01.32	01.32	01.32
Phosphorus (%)	01.11	01.09	00.94	01.04	01.01
ME (kcal/kg)	2834.00	2842.50	2938.90	3035.20	3131.50

ME = Metabolisable energy. ME= %CP x 37 + %EE x 81+ %NFE x 35.5 (35).

**1kg of premix contains: Vitamins A (5, 000, 000 I.U), Vitamin D3 (1000000 I.U), Vitamin E (16000mg), Vitamin K3 (800mg), VitaminB1 (1200mg), Vitamin B2 (22000mg), Niacin(22000mg), Calcium pontothenate (4600mg), Vitamin B6 (200mg), Vitamin B12 (10mg),Folic acid (400mg), Biotin (32mg), Choline chloride (200000mg), Manganese (948000mg), Iron (40000mg), Zinc (32000mg), Copper(3400mg), Iodine (600mg), Cobalt (120mg), selenium (48mg), Anti-Oxidant (48000mg)*

Table 2: Composition and calculated analysis of the experimental finisher diets

Percent of full-fat soya bean replaced with baobab seed meal					
Ingredients (%)	T1(0)	T2(25)	T3(50)	T4(75)	T5(100)
Maize	55.88	55.88	55.88	55.88	55.88
Fullfat soya bean	24.42	18.32	12.21	06.11	00.00
Baobab seed meal	00.00	06.11	12.21	18.32	24.42
Wheat offal	13.00	13.00	13.00	13.00	13.00
Fish meal	03.00	03.00	03.00	03.00	03.00
Bone meal	03.00	03.00	03.00	03.00	03.00
Common salt					
(NaCl)	00.25	00.25	00.25	00.25	00.25
Min-vit-premix*	00.25	00.25	00.25	00.25	00.25
Methionine	00.10	00.10	00.10	00.10	00.10
Lysine	00.10	00.10	00.10	00.10	00.10
Total	100.00	100.00	100.00	100.00	100.00
Calculated analysis					
Crude protein (%)	20.00	20.22	20.44	20.66	20.86
Crude fibre (%)	04.37	04.53	05.19	05.87	06.53
Ether extract (%)	03.69	04.68	05.66	06.64	07.63
Methionine (%)	00.43	00.47	00.51	00.56	00.60
Lysine (%)	01.03	01.08	01.16	01.23	01.34
Calcium (%)	01.24	01.25	01.25	01.25	01.26
Phosphorus (%)	01.07	01.05	01.03	01.00	00.99
ME (kcal/kg)	2906.70	2965.70	3024.20	3083.3033141.70	

ME = Metabolisable energy. ME= %CP x 37 + %EE x 81+ %NFE x 35.5 (35)

**1kg of premix contains: Vitamins A (5, 000, 000 I.U), Vitamin D3 (1000000 I.U), Vitamin E (16000mg), Vitamin K3 (800mg), VitaminB1 (1200mg), Vitamin B2 (22000mg), Niacin(22000mg), Calcium pontothenate (4600mg), Vitamin B6 (200mg), Vitamin B12 (10mg),Folic acid (400mg), Biotin (32mg), Choline chloride (200000mg), Manganese (948000mg), Iron (40000mg), Zinc (32000mg), Copper(3400mg), Iodine (600mg), Cobalt (120mg), selenium (48mg), Anti-Oxidant (48000mg)*

Table 3: Haematological indices of broiler chickens fed baobab seed meal at differentreplacement level of soya bean meal.

Percent of full-fat soya bean replaced with baobab seed meal							
Parameters	T1(0)	T2(25)	T3(50)	T4(75)	T5(100)	Mean	SEM
PCV (%)	32.95b	32.28^{b}	36.06^{a}	31.87^{b}	33.18^{b}	33.27	1.11*
Hb (g/dl)	11.81^{ab}	11.41^{b}	12.43^{a}	11.45^{b}	11.68^{ab}	11.76	0.37*
RBC ($x10^{6}/mm^{3}$)	2.34^{c}	2.36^{b}	2.62^{a}	2.42^{abc}	2.59^{ab}	2.46	0.11*
MCV (fl)	141.12^{a}	135.50^{b}	136.23^{b}	134.18^{b}	128.48^{c}	135.10	2.09*
MCH (pg)	50.45^{a}	47.76^{b}	47.33^{b}	47.38^{b}	45.76^{b}	47.74	1.10*
MCHC (%)	35.83	35.36	34.70	35.00	35.16	35.21	0.73^{NS}
WBC ($x10^{3}/mm^{3}$)	65.67^{ab}	67.05^{ab}	64.73^{b}	68.33^{a}	68.50^{a}	66.86	1.51*

a, b, c= Means on the same row with different superscripts differ significantly (P<0.05)SEM=Standard error of mean

NS = Not Significant (P>0.05) PCV = Packed cell volume WBC= white blood corpusculesRBC= red blood corpusculesMCHC = mean corpuscular haemoglobin concentration Hb =haemoglobin concentration MCV= Mean corpuscular volumeMCH= mean corpuscular haemoglobin

Table 4: Serum biochemical indices of broiler finisher chickens fed baobab seed meal at different replacement level of soyabean meal

Percent of full-fat soyabean replaced with baobab seed meal							
Parameters	T1(0)	T2(25)	T3(50)	T4(75)	T5(100)	MEAN	SEM
Total Protein (g/l)	42.50	41.16	42.16	39.83	40.66	41.26	1.38^{NS}

Albumin (g/l)	31.83	32.16	32.00	32.00	32.16	32.03	0.73^{NS}
Globulin (g/l)	10.67	9.00	10.16	7.83	8.50	9.23	0.34^{*}
Urea (mmol/l)	0.59	0.36	0.47	0.23	0.29	0.39	0.19^{NS}
Cholesterol(mmol/l)	3.06	2.63	2.88	3.35	3.48	3.08	0.43^{NS}
Glucose (mmol/l)	6.85^{a}	6.83^{a}	6.16^{ab}	6.30^{ab}	5.93^{b}	6.41	0.34^{*}

a, b, = Means in the same row bearing different superscripts differ significantly (P<0.05).
SEM=Standard error of mean
NS=Not significant (P>0.05)
**=Significant (P<0.05)*