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Nutritional utilization of baobab (*Adansonia digitata)* leaf meal on growth performance and carcass characteristics of broiler chickens in Sudan savannah of Nigeria

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Abstract

This experiment was conducted to determine the effect of dietary utilization of baobab leaf meal (BLM) on performance, carcass characteristics and hematological parameters of broiler chickens. Two hundred and twenty five (225), one day old broiler chickens (Marshall Breed) were used for the study. Five diets were formulated containing baobab leaf meal (BLM) at dietary levels of 0, 2.5, 5, 7.5 and 10% designated as T1, T2, T3, T4 and T5 respectively. Chicks were randomly allotted to treatments in a completely randomized design (CRD) and each treatment was replicated three times consisting of 45 broiler chickens with 15 chicks per replication. The experiment lasted for eight weeks. Sample of BLM, experimental diet and faeces were analyzed for proximate compositions. Similarly, levels of anti-nutritional factors in BLM were also evaluated. The results at starter phase showed that the final body weight, daily weight gain and total weight gain were significantly (P < 0.05) higher at 7.5% BLM diet compared to other treatments. The feed conversion ratio (3.30) and feed cost in naira per Kg gain (N257) were significantly (P< 0.05) better at 7.5% BLM diet compared to others. The same trend was observed at finisher phase in the final body weight (2147.80g) and daily weight gain (52.39g). Similarly, feed conversion ratio (3.14) and feed cost in naira per Kg gain (N289.89) were significantly (P< 0.05) better at 7.5% BLM diet compared to other treatments. The results for carcass analysis showed that there were significant differences (P < 0.05) in final live weight (2.15 Kg) as broiler chickens fed 7.5% BLM diet had significantly (P< 0.05) highest values of carcass weight (1.52 Kg) and dressing percentage (72.04%). There were significant differences (P<0.05) in thigh muscle, back and small intestinal weights in which 7.5% BLM diet had the highest values across the treatments. Most of the organs weights were not significantly (P>0.05) affected by BLM inclusion with exception of crop and proventriculus. Therefore, it was concluded that BLM can be incorporated in the diet of broiler chickens up to 7.5% level without any adverse effect on the performance, carcass yield with concomitant reduction in the cost of production

Keywords: Baobab leaf meal, broiler chickens, performance and carcass characteristics

Introduction

The high cost of animal products is attributed to high cost of livestock feed which generally accounts for 60 – 70% of the total cost of production (Lawrence *et al.,* 2008). Malnutrition is known to be prevalent in under-developed countries as majority of malnourished people live in Asia and Africa and this has a negative impact on their physical and health condition (Mahadi, 2002). Ali-Balogun *et al*. (2003) reported that poor animal proteins intake by man has been associated with dwindling livestock productivity. It is interesting to note that poultry production was identified as major means of solving problems that arise from malnutrition through provision of animal protein that are beneficial to humans within a short period (Nworgu, 2004). Poultry farmers in Nigeria utilize conventional feed ingredients in producing their feeds. Unfortunately, these

feed ingredients have become scarce, at times unavailable and very expensive. Apart from the major conventional plant protein sources (soybean meal and groundnut cake), others like pigeon pea seed meal, cashew nut meal, sunflower seed meal and lima bean meal are not usually available and not within the reach of farmers (Amaefule and Obioha, 2003). As part of research effort to search for alternative feed ingredients, baobab and its products have been investigated (Shukla *et al.,* 2001; Sola-Ojo *et al.,* 2011; Oladunjoye *et al*., 2014 and Adamu *et al.,* 2015). Even when baobab seed is processed, it effects on performance and state of health of animals must be duly investigated before recommending it to farmers. *Adansonia digitata* (Baobab) is one of the potential low-cost and locally available protein sources in livestock diets for African agriculture. The tree is native to semiarid areas of Nigeria (Swanapoel, 1993). Baobab is a well-adapted deciduous tree native to the arid part of Central Africa and widely spread in the Savannah regions of Nigeria (Wickens, 1980). Its leaves bark and fruit are used as food and for ethno-medicinal purposes for man in many parts of African countries. In the Sahel, for example, baobab leaf is used in a staple soup especially in the Northern Nigeria, the leaves are used to make "Miyar Kuka" a soup prepared by boiling leaf in the spices water and it was reported to be a rich source of vitamin C (Ezeagu *et al.,* 2003). It provides some necessary fibre, vitamins, minerals and amino acids, particularly, lysine and methionine which are limited in most cereals but essential for livestock growth and development (Glew *et al.,* 1997 and Murray *et al.,* 2001). Efforts are being made by researchers to explore the possibilities of incorporating unconventional protein feedstuffs in poultry feeds in order to reduce the cost of production and maximize the returns from poultry farming. This study was designed to investigate the effect of dietary utilization of baobab (*Adansonia digitata)* leaf meal in broiler chickens diets on growth performance and carcass characteristics of broiler chickens.

Materials and methods

Experimental site

The study was conducted at Teaching and Research Farm of the Department of Animal Science, Kano University of Science and Technology, Wudil, Kano State. Wudil is located within the Sudan savannah region of Nigeria. The experimental site is located on the latitude 11° 37'N and longitude 8° 58'E and at an altitude of 403 m above sea level. The annual rainfall ranges from 850 mm – 870 mm with minimum and maximum temperature of 26°C and 36°C, respectively. The relative humidity of the region is always low and ranges between 40% - 51% (Olofin *et al.,* 2008).

Experimental diets and design

Fresh baobab leaves were obtained from Darki town Wudil. The harvested leaves were air dried under a shed. The leaves were then milled to obtain products which are referred to as baobab leaf meal (BLM). Sample was subjected chemical analysis and the proximate composition was determined according to AOAC (1990) as presented in Table 1. Five experimental diets were formulated, T_1 was the control (0%) with no baobab leaf meal, diets T_2, T_3, T_4 and T_5 had 2.5, 5, 7.5 and 10% baobab leaf meal respectively included in the diets. Also five nitrogenous and isocaloric diets were formulated for broiler starter and finisher diets as shown in Tables 2 and 3, respectively. Diets were allocated to experimental animals in a completely randomized design (CRD). Each treatment was replicated three times consisting of 15 chicks per replicate having 45 boiler chickens per treatment.

Table 1: Proximate composition of baobab leaf meal (*Adansonia digitata*)

Proximate component	Percentage (%)
Dry matter	94.86
Crude protein	13.25
Crude fibre	10.97
Ether extract	2.44
Ash	11.21
Nitrogen free extract	62.13

Table 2: Composition of the broiler starter diets containing Baobab leaf meal (BLM)

	Treatments				
Ingredients	**T1 (0%)**	**T2 (2.5%)**	**T3 (5%)**	**T4 (7.5%)**	**T5 (10%)**
Maize	54.45	53.25	52.48	52.10	51.55
Soybean meal	33.50	32.00	30.52	29.40	27.45
Baobab leaf meal	0.00	2.50	5.00	7.50	10.00
Fish meal	3.50	3.00	3.00	3.00	3.00
Wheat offal	4.00	4.00	4.00	4.00	4.00
Bone meal	3.50	3.00	3.00	3.00	3.00
Salt	0.30	0.30	0.30	0.30	0.30
Methionine	0.20	0.25	0.25	0.25	0.25
Lysine	0.30	0.20	0.20	0.20	0.20
Vitamin/mineral mixture	0.25	0.25	0.25	0.25	0.25
Total	100	100	100	100	100
Calculated analysis					
Crude protein (%)	23.00	23.00	23.00	23.00	23.00
ME.(Kcal/kg)	2980	2950	2931	2930	2929
Crude fiber (%)	4.82	4.85	4.62	4.39	4.15
Ether extract (%)	7.72	6.73	6.65	6.65	6.46
Ash (%)	3.39	3.29	3.26	3.27	3.25
Ca (%)	1.33	1.34	1.35	1.36	1.38
P (%)	0.90	0.91	0.92	0.93	0.94
Lysine (%)	1.12	1.17	1.23	1.30	1.33
Methionine (%)	0.61	0.62	0.64	0.68	0.69

**Vitamin premix supplied the following per kg of diet: Vit. A, 10000i.u, Vit. D, 2000 i.u;Vit k,2mg Vit.B1(Thiamine), 1.8mg; Vit B2 (Riboflavin), 5.5mg; Vit B6 (Pyridoxine), 0.3mg; Vit B12, 0.015mg; Pantothenic acid, 7.5mg; Folic acid, 0.75mg; Niacin, 27.5mg; Biotin, 0.6mg; Chorine chloride, 3000mg; Cobalt, 0.2mg; copper, 3mg; Iodine, 1mg; Iron, 20mg; manganese, 40mg; Selenium, 0.2mg; Zinc, 30mg; Antioxidant, 1.25mg;*

Experimental birds and their management

Two hundred and twenty five (225) one day old chicks (Marshal Breed) were used in this experiment. The chicks were housed in pens (deep litter system) equipped with feeders and drinkers, heat, lighting were provided. Feed was supplied in chick tray feeders and fountain drinkers were used to supply water. Feed and water were offered *ad-libtum* throughout the experimental period. Routine medication and vaccination were appropriately carried out.

Data collection

The broiler chicks were weighed individually at the beginning of the experiment for the initial body weight using digital weighing scale and subsequently weighed on weekly basis to determine the growth rate of the animals. The average daily weight gain was determined by subtracting initial body weight of broiler chickens from the final body weight. per week per day per number of birds in

Table 3: Composition of broiler finisher diets containing graded levels of baobab leaf meal

	Treatments				
Ingredients (%)	**T1 (0%)**	**T2 (2.5%)**	**T3 (5.0%)**	**T4 (7.5%)**	**T5 (10%)**
Maize	62.90	61.75	60.25	58.75	57.25
Soya bean meal	25.05	24.75	23.75	22.75	21.75
Baobab leaf meal	**0.00**	**2.50**	**5.00**	**7.50.**	**10.00**
Fish meal	3.50	3.00	3.00	3.00	3.00
Wheat offal	4.00	4.00	4.00	4.00	4.00
Bone meal	3.50	3.00	3.00	3.00	3.00
Salt	0.30	0.30	0.30	0.30	0.30
Lysine	0.30	0.20	0.20	0.20	0.20
Methionine	0.20	0.25	0.25	0.25	0.25
*Vitamin-mineral premix	0.25	0.25	0.25	0.25	0.25
Total	100	100	100	100	100
Calculated analysis (%)					
Crude protein	20.00	20.00	20.00	20.00	20.00
M. E.(Kcal/kg)	3012	3011	3013	3014	3015
Crude fiber	3.12	3.15	3.12	3.16	4.14
Ether extract	4.72	4.13	4.15	4.12	4.13
Ash	5.39	5.29	5.28	5.27	5.25
Ca	1.30	1.32	1.36	1.38	1.39
P	0.90	0.92	0.93	0.94	0.95
Lysine	1.10	1.11	1.12	1.13	1.14
Methionine+ cysteine	0.60	0.62	0.64	0.66	0.68
Feed Cost ₦ /kg	75.16	74.56	73.96	73.36	72.77

**Vitamin premix supplied the following per kg of diet: Vit A, 10000 i.u.; Vit D3 2000 i.u.; Vit E, 23mg; Vit K,2mg; Vit K2mg; B1 (thiamine) 1.8mg; Vit B2 (Riboflavin), 5.5mg; Vit B6 (Pyr idoxine),3.0mg; Vit. B12, 0.015mg; Pantothenic acid, 7.5mg; Folic acid, 0.75mg; Biotin, 0.06mg; Choline chloride, 300mg; Cobalt, 0.2mg; copper, 3mg; Iodine, 1mg; Iron 20mg; manganese, 40mg; Selenium 0.2mg; Zinc, 30mg; Antioxidant, 1.25mg;*

replication. *Feed intake was determined as a difference between quantity of* feed offered to broiler chickens and the left-over. It is obtained by subtracting the weight of left-over from the amount offered to birds per replication. *Feed Conversion Ratio* (FCR) was evaluated by calculation as ratio of feed intake and weight gain. It was determined by feed consumed per unit body weight gain by chickens. *Mortality rate* was determined the from the number of dead chickens in each treatment and expressed in percentage. *Carcass analysis was conducted with* nine (9) birds from each treatment consisting three bird per replicate for carcass analysis. The broiler chickens were starved for 24 hours, weighed using 10Kg weighing balance. They were then bled, defeathered, plucked, weighed and eviscerated. The visceral organs (kidneys, liver, heart, spleen and lung) of the animals were carefully removed, cleaned and weighed. The carcasses weights were measured and recorded as follows: The weights of the carcass and the organs weights were then expressed as the percentage of the live weight.

Statistical analysis

Data generated was subjected to Analysis of variance in a statistical analysis system package (SAS, 2002). Where significant differences exist between the means a Duncan Multiple Range Test (D.M.R.T) was used to separate the means.

Results and discussion

Proximate composition of baobab leaf meal (BLM) is presented in Table 1. The results revealed the dry matter (94.86%), crude

protein (13.25%), crude fiber (10.97%), EE (2.44%), ash (11.21%) and NFE (62.13%) of baobab leave meal. The crude protein, ash and crude fibre values obtained in this study were within the ranges of 5-15% CP, 70-90% and 10-19% as reported by Belewu *et al.* 2008; Parkouda, 2012). However, the dry matter, nitrogen free extract content obtained in this study agreed with the finding of Abioye *et al*. (2014) who reported dry matter to be within the ranges of 90-94% and 70-85% NFE, respectively**.** The growth performance of broiler chickens at starter phase is shown in Table 4. There were significant differences (P<0.05) in the final body weight, daily weight gain and total weight gain. Broiler chickens fed 7.5% BLM diet (T_4) had significantly (P<0.05) higher values of final body weight (681.00g), daily weight gain (22.91g) and total weight gain (641.50g) compared to other treatments. The values were similar to those fed T2 (2.5% BLM diet). However, birds on T1 and T3 were similar in final body weight. The lowest value of final body weight was recorded in birds on T5 (530.78g). The higher final body weight and total weight gain observed in T_4 (7.5% BLM) agreed with Rafiu ***et al.*** **(2017**) that birds on 10% baobab leaf meal had better performance. The growth rate of birds on 7.5% BLM was highly comparable to those on control diet at starter phase. These results agreed with Nworgu (2015) who reported that baobab leaf meal inclusion in broiler diet showed low cost effectiveness as replacement for groundnut cake and soya bean meal. Furthermore, a non significant differences (P>0.05) were observed in daily feed intake, total feed intake and mortality across the treatments. The feed conversion ratio (FCR) and feed cost in naira per kilogram gain were significantly (P<0.05) better for birds fed T4 (**N**257.80 and 3.30) respectively. The poor feed conversion ratio was observed in T_5 (10% BLM) could probably be due to the tannin contents and other anti-nutritional factors in baobab leaves as reported by Ayo-Ajasa *et al.* (2015), which can depress growth and feed utilization (Douglas *et al.,* 1993). The feed conversion was also significantly better chickens fed treatment 3 (3.41). This may be due to the better feed utilization by broiler chickens at 5% dietary level. This also agreed with report of Doma (1998) who reported that the lower the feed conversion ratio the better the diet in monogastric animals**.** Table 5 shows the performance of broiler chickens fed BLM diets at finisher phase. There were significant differences (P<0.05) in final body weight, daily weight gain, total weight gain and daily feed intake. Birds fed 7.5% BLM diet (T4) had significantly (P<0.05) higher value of final body weight (2147.80g), daily weight gain (52.39g) and total weight gain (1466.80g). However, the lowest final body weight was recorded in birds fed T5 (10% BLM diet), which was similar with those on T3 and T5. The results of performance showed higher weight gain and final body weight at 7.5% BLM diets compared to other treatments. This is consistent with Mwale *et al.* (2008) who noted that BLM can be included in the diets of monogastric animals as a protein source without any adverse effects. No significant differences (P>0.05) were recorded in total feed intake and mortality across the treatments. The feed conversion ratio and feed cost in naira per kilogram gain were significantly (P<0.05) better for birds fed T4 (**N**289.89 and 3.14 respectively) compared to other treatments. BLM inclusion beyond 10 % in the diet brought about a decline in feed consumption and conversion rate (Mwale *et al*., 2008). Adewusi and Matthew (1994) reported that increase in dietary fiber content in rat diets resulted in a corresponding decrease in feed consumption, conversion rate and true digestibility.

Table 4: Performance of broiler chickens fed diets containing baobab leaf meal at starter phase (0-4 weeks)

	Treatment					
Parameters	**T1 (0%)**	**T2 (2.5%)**	**T3 (5%)**	**T4 (7.5%)**	**T5 (10%)**	**SEM**
Initial body weight(g)	39.50	39.49	39.50	39.50	39.51	0.01
Final body weight(g)	544.46^{bc}	613.34^{ab}	594.21^{bc}	681.00^{a}	530.78^{c}	23.86
Daily weight gain(g)	18.06^{bc}	20.49^{ab}	19.81^{bc}	22.91^{a}	17.54^{c}	0.85
Total weight gain(g)	504.96^{bc}	573.85^{ab}	554.70^{bc}	641.50^{a}	491.27^{c}	23.85
Daily feed intake(g)	66.13	68.90	67.70	66.51	68.49	2.26
Total feed intake(g)	1862.4	1895.7	1929.4	2309.8	1917.7	210.00
Feed conversion ratio(g)	3.68^{a}	3.38^{ab}	3.41^{ab}	3.30^{b}	3.94^{c}	0.20
Feed cost(₦ /kg gain)	346.62^{a}	313.18^{ab}	309.04^{ab}	257.80^{b}	339.89^{a}	18.23
Mortality rate (%)	0.33	0.66	0.66	0.33	0.66	0.42

^{abc} *Means with different superscripts on same the row are significantly different (P<0.05)*
SEM=Standard error of means

Table 5: Performance of broiler chickens fed diets containing baobab leaf meal at finisher phase (4-8 weeks)

	Treatment					
Parameters	**T1 (0%)**	**T2 (2.5%)**	**T3 (5%)**	**T4 (7.5%)**	**T5 (10%)**	**SEM**
Initial body weight(g)	544.54^{bc}	613.34^{ab}	594.21^{bc}	681.00^{a}	530.78^{c}	8.26
Final body weight(g)	1876.67^{b}	1915.68^{b}	1750.23^{bc}	2147.80^{a}	1640.20^{c}	69.52
Daily weight gain(g)	47.57^{ab}	46.55^{ab}	41.29^{b}	52.39^{a}	39.62^{b}	2.49
Total weight gain(g)	1332.12^{ab}	1305.34^{ab}	1156.03^{b}	1466.80^{a}	1109.42^{b}	69.80
Daily feed intake(g)	171.48^{ab}	166.59^{b}	166.76^{b}	163.85^{b}	176.16^{a}	2.46
Total feed intake(g)	6027.1	4664.7	4669.4	4587.9	4932.5	574.64
Feedconversionratio(g)	3.61^{bc}	3.58^{c}	4.12^{ab}	3.14^{c}	4.46^{a}	0.21
Feed cost(₦ /kg gain)	354.83^{ab}	344.81^{ab}	389.49^{a}	289.89^{b}	403.67^{a}	19.85
Mortality rate (%)	0.33	0.33	0.00	0.33	0.66	0.29

^{abc} *Means with different superscripts on same the row are significantly different (P<0.05)*
SEM=Standard error of means

The carcass analysis of broiler chickens fed BLM diets is presented in Table 6. There were significant (P<0.05) differences in final live weight, carcass weight, thigh muscle, back and small intestine. Birds fed T4 (7.5% BLM diet) had significantly (P<0.05) higher values of final live weight (2.15Kg), carcass weight (1.52g), thigh muscle (12.61g) and back weight (16.52 %). The values on thigh muscle and back weight obtained were similar to those fed T1 (0%), T2 (2.5%) and T3 (5%) BLM diets, nevertheless, birds on T5 (10%) had the least value of final live weight (1.65 kg) which was similar values obtained in T1 and T3 BLM diet. Non significant (P>0.05) differences were observed in wings, drumstick, breast muscle and others with exception o small intestine. All these parameters were close to the values reported (Onu *et al*., 2001) for broiler chickens at nine weeks of age. However, the final live weight (1876.67 to 2147.80g) obtained in this study were lower than the value (2495g) reported (Onu *et al*., 2001). This observation may be due to the prevalent weather condition at the time of the study. The dressing percentage (70.06 to 64.54%) obtained in this study is within the values (70.75%) reported by Ravindran and Savakanessan (1996). as the ideal dressing percentage for well finished

broiler chickens. The higher values recorded signifies that inclusion baobab leaf in broiler chickens diets provide adequate nutrients to be utilized. Aduku and Olukosi (1990) also reported that changes in dressing percentages may be attributed to the differences in weight at slaughter. The percentage of abdominal fat obtained in this study (1.89 to 2.29%) agreed with the findings of Ravindran and Savakanessan (1996) who reported that fats in broiler chickens at 43 days of age accounts for as much as 10 to 15% of the total carcass weight which is by far higher than the values recorded in this study. Nevertheless, the low abdominal fat in this study can make birds on dietary treatment worthwhile for the sake of health benefit. The non-significant differences observed in this study on wings, legs, head, small and large intestine, length and weight indicated that the diets provided adequately all the needed nutrients for broiler chickens. The breast weight (14.01-17.25) obtained in this study is in contrary to the values of (19.10 to 21.23%) obtained by Igwebuike *et al*.

Table 6: Carcass weights of broiler chickens fed diets containing baobab leaf meal at finisher phase 4-8 weeks

	Treatments					
Parameters	**TI (0%)**	**T2(2.5%)**	**T3 (5%)**	**T4(7.5%)**	**T5(10%)**	**SEM**
Final live weight (kg)	1.82^{bc}	1.92^{b}	1.75^{bc}	2.15^{a}	1.65^{c}	0.07
Carcass weight (kg)	1.34^{b}	1.29^{b}	1.11^{c}	1.52^{a}	1.06^{c}	0.06
Dressing percentage (%)	70.06	69.24	64.54	72.04	64.22	2.65
Drum stick (%)	11.17	10.61	9.17	10.18	8.69	1.09
Thigh muscle (%)	12.15^{ab}	12.32^{ab}	12.73^{a}	12.61^{ab}	10.06^{b}	0.77
Back (%)	11.60^{a}	15.83^{a}	15.89^{a}	16.52^{ab}	13.34^{b}	1.24
Wings (%)	8.74	8.10	21.26	7.14	7.71	6.62
Brest muscle (%)	14.01	15.89	13.02	17.25	15.32	1.29
Head (%)	2.49	2.59	2.68	2.35	2.75	0.59
Abdominal fat (%)	1.89	4.51	2.29	1.35	1.66	1.37
Feet (%)	3.67	3.79	3.52	3.48	3.95	0.33
Small intestine weight (%)	2.49^{b}	0.42^{b}	0.42^{b}	0.37^{b}	0.53^{b}	0.09
Small intestine length (cm)	7.03	7.41	8.38	7.89	9.32	0.02
Large intestine weigh (%)	1.13	1.12	3.15	1.13	1.18	0.96
Small intestine length (cm)	2.55	2.28	2.42	2.18	2.50	0.18

^{abc} Means with different superscripts on the same row are significantly different (P<0.05)
SEM=Standard error of means

Table 7: Organs weights of broiler chickens fed diet containing baobab leaf meal at finisher phase 4-8wks

	Treatments					
Parameters	**T1 (0%)**	**T2 (2.5%)**	**T3 (5%)**	**T4 (7.5%)**	**T5 (10%)**	**SEM**
Crop (%)	0.59^{b}	0.42^{c}	0.58^{b}	0.60^{a}	0.56^{b}	0.06
Proventriculus (%)	0.61^{a}	0.56^{b}	0.58^{b}	0.46^{c}	0.31^{c}	0.05
Gizzard (%)	2.11	1.94	2.09	3.61	1.79	0.65
Liver (%)	2.31	2.06	2.20	2.00	2.13	0.13
Heart (%)	0.37	0.42	0.41	0.37	0.44	0.03
Lung (%)	0.61	0.62	0.57	0.68	1.67	0.52
Kidney (g)	0.17	0.19	0.21	0.37	0.30	0.06
Spleen (%)	0.11	0.87	0.11	0.12	0.12	0.02
Pancreas (%)	0.20	0.24	0.32	0.19	0.23	0.05

^{abc} Means with different superscript in the same ro w shows significantly different (P<0.05)
SEM=Standard Error of means

(2017). This variation could be as a result of age, because Igwebuike *et al*. (2017) terminated their experiment at seven weeks of age, while this experiment was terminated at nine weeks of age. However, the weight of drum stick (11.17-10.18) obtained in this study were within the ranges of 9.13 to 10.25% recorded by Igwebuike *et al*. (2017) in broiler chickens fed diets containing *Maringa oleifera* and baobab leaf powders as supplements. The result on organs weights is presented in Table 7. There were no significant differences (P>0.05) in most of the organs weights with the exception of crop and proventriculus. Crop had the highest percentage values in T4 (0.60%), while, proventriculus weight was recorded highest in T1 (0.61%) compared to other treatments. Numerically, liver weight was observed highest in birds fed T1 (2.31%) compared to others. Lungs and kidney were also numerically higher in T4 with 0.68 and 0.37% respectively. The weight of the visceral organs such as proventriculus and crop were significantly (P<0.05) effected by the dietary treatments. Higher gizzard weight in birds fed 7.5% BLM may be due to the high level of fibre in this diet.as gizzard size is known to be influenced by the degree of feed coarseness resulting from increased in muscular activities during grinding (Fanimo, *et al*., 1996). However, high fibre inclusion reduced gizzard Ph, improves digestive juices secretion. Gizzard function and digest flow might modify macrobiotic in GIT of the birds (Guerrero *et al*., 2010).

Conclusion

Based on this research, it was concluded that Baobab leaf meal can be included in the diet of broiler chickens up to 7.5 % without any deleterious effect on growth performance and carcass characteristics with concomitant reduction in the cost of production

Recommendation

It is therefore recommended, that baobab leaf meal can be included in the diets of broiler chickens up to 7.5% without any adverse effects on the growth performance and carcass yield of broiler chickens

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