DIGESTIBILITY AND CARCASS CHARACTERISTICS OF BROILER CHICKENS FED GRADED LEVELS OF BAOBAB (*Adansonia digitata* L.) SEED MEAL

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ABSTRACT

This study investigates the effect of replacing soyabean meal with baobab seed meal (BSM) on digestibility and carcass characteristics of broiler chickens. BSM replaced soyabean at 0, 25, 50, 75 and 100%levelsin the diets; Each treatment was replicated thrice with 15 birds per replicate in a Completely Randomized Design (CRD).Significant difference ($p<0.05$) existed amongst the treatment for digestibility, birds on 75% BSM recorded the highest dry matter (69.00%), crude protein (72.34%) and crude fiber (36.99%) digestibility than other groups. There were no significant difference ($P>0.05$) in carcass parameters except in dressing percent, head, shank and gizzard weights. It can be concluded that BSM can replace soyabean in the diets of broiler chickens upto 100% without deleterious effect.

Keywords: Baobab seed, digestibility, broiler chicken.

INTRODUCTION

The baobab (*Adansoniadigitata L.)* is a symbolic tree that is found throughout Africa. In Nigeria it is widely spread in the savannah regions. Baobab leaves and fruit (pulp) are widely utilized (Feedipedia, 2013). The seed are however, narrowly exploited and thus, wasted (Ezeagu, 2005). Some authors (Saulawa *et al.*, 2014) had hinted on the potential use of baobab seed as protein supplement for poultry. However, studies on digestibility and carcass characteristics of broilers chicken sare scarce in literature. This study therefore is aimed at investigating the effect of baobab seed on digestibility and carcass characteristics of broiler chickens.

MATERIALS AND METHODS

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. Two hundred and twenty-five broiler chicks were used for the experiment. The birds were fed starter diet four weeks after which they were individually weighed and randomly assigned to various dietary groups. Similarly, all the necessary routine husbandry management practices were duly observed. Baobab seed was purchased from a local market. The seed was washed, sun dried and milled to produce baobab seed meal (BSM), this was used to formulate five diets for the finisher phase. BSM replaced soya bean in the diets at 0, 25, 50, 75 and 100% levels . 225 broiler chicks were randomly assigned to five dietary treatments. Each treatment was replicated thrice with 15 birds per replicate in a Completely Randomized Design. Feed and water were provided *ad libitum*. The composition and calculated analysis of the experimental diets are presented in Table 1. At the end of the 4 weeks trial, six birds per treatment were randomly selected and introduced into metabolic cages for the digestibility trial. The faecal samples were collected and dried, representative samples were taken for chemical analysis. The apparent nutrient digestibility (AND) was calculated as follows:

$$AND = \frac{(NF \times FI) - (Nf \times FO)}{(NF \times FI)} \times 100$$

Where NF = Amount of nutrients in feed (g), FI = Feed intake (g) Nf =Amount of nutrient in faeces (g), FO = Faecal output (g)

At the end of experiment, six birds were randomly selected from each treatment. The chickens were slaughtered after overnight fasting. Cut-up parts and visceral organs were exicised and expressed as percentage of dressed

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Table 1 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
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
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	3083.30	3141.70

ME = Metabolisable energy. ME= %CP x 37 + %EE x 81+ %NFE x 35.5 (Pauzenga, 1985)

Table 2 Proximate composition of baobab seed meal

Parameters	**Percentages**
Dry matter	97.5
Crude protein	48.43
Crude fibre	17.5
Ether extract	19.6
Nitrogen-free extract	10.47
Ash	4.0
ME (kcal/kg)	3734

Values are means of 3 determinations.ME =Metabolisableenergy ME= %CP x 37 + %EE x 81+ %NFE x 35.5 (Pauzenga, 1985)

Table 3: Nutrient digestibility of broiler chickens finished on baobab seed meal as a replacement for soya bean meal (%)

	Percent of full-fat soya bean meal replaced with baobab seed meal						
Nutrients	T1(0)	T2(25)	T3(50)	T4(75)	T5(50)	Mean	SEM
Dry matter	65.73^{c}	68.11^{ab}	67.42^{b}	69.00^{a}	69.00^{a}	67.33	0.37*
Crude protein	71.98^{a}	70.66^{a}	60.62^{b}	72.34^{a}	71.10^{a}	69.34	0.35*
Crude Fibre	23.24^{d}	27.37^{c}	34.73^{b}	36.99^{a}	33.88^{c}	31.24	0.21*
Ether extract	67.73^{a}	60.63^{c}	63.80^{b}	64.23^{b}	50.04^{d}	53.28	0.25*
NFE	74.22^{d}	80.90^{a}	79.95^{b}	78.38^{c}	80.78^{a}	78.84	0.27*

*a, b, c,d = Means in the same row bearing different superscripts differ significantly (P<0.05).SEM =Standard error of mean, *=Significant (P<0.05)NFE = Nitrogen Free Extract*

Table 4. Carcass characteristics of broilers finished on diets containing baobab seed meal at different replacement levels 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
Live weight (g)	1960.00	1817.17	1921.70	2147.30	1809.32	1913.4	160.45^{NS}
Plucked weight	1774.77^{a}	1680.66^{ab}	1770.0^{a}	1822.06^{a}	1589.37^{b}	1727.38	265.654*
Dressed weight (g)	1308.8	1210.5	1304.8	1328.0	1122.0	1254.8	112.43^{NS}
Dressing (%)	67.55^{a}	66.66^{ab}	67.53^{a}	61.84^{b}	61.61^{b}	65.04	1.66*
	Weight of cut-up parts (% Dressed weight)						
Breast	24.76	21.40	20.66	23.89	19.36	22.01	3.14^{NS}
Thighs	19.82	16.95	19.56	19.75	18.24	18.86	1.32^{NS}
Drum stick	14.99	14.16	14.10	16.33	17.61	15.44	1.36^{NS}
Wings	13.43	16.88	14.92	14.37	15.99	15.12	1.90^{NS}
Back	11.83^{a}	14.95^{b}	14.30^{b}	14.24^{b}	14.14^{b}	13.96	0.65*
Thorax	14.41	18.43	18.49	17.57	15.09	16.80	2.75^{NS}
	Other components and organ weights (% Dressed weight)						
Head	2.93^{b}	3.63^{ab}	4.10^{ab}	4.38^{a}	4.53^{a}	3.91	0.37*
Shanks	5.10^{c}	6.26^{bc}	6.03^{bc}	6.94^{ab}	7.62^{a}	6.39	0.39*
Neck	7.46	8.53	7.30	7.14	7.11	7.51	1.08^{NS}
Gizzard	3.91^{ab}	4.36^{ab}	3.43^{b}	4.59^{ab}	5.00^{a}	4.26	0.49*
Liver	2.98	2.98	3.06	2.69	3.52	3.04	0.31^{NS}
Heart	0.69	0.69	0.61	0.72	0.58	0.66	0.08^{NS}
Abdominal Fat	3.46	4.50	3.11	3.49	3.75	3.38	0.56^{NS}
Proventriculus	0.22	0.45	0.34	0.78	0.25	0.41	0.10^{NS}
Crop	0.64	0.94	0.78	0.77	0.71	0.77	0.21^{NS}

*a, b, c = Means on the same row with different superscripts differ significantly (P<0.05) SEM =Standard Error of Means * =Significant (P<0.05) NS =Not Significant (P>0.05)*