

EFFECT OF TWO PROCESSING METHODS OF BAMBARANUT (*VOANDZEIA SUBTERRANEAM*) ON THE PERFORMANCE OF BROILER CHICKENS.

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(Received 11 February, 2005 ; Revision accepted 4 April, 2005)

ABSTRACT

Present an experiment on evaluation of two processing methods of Bambaranut, boiling and roasting on the performance of broiler chickens. Hundred-day-old chicks were randomly allocated to four dietary treatments each replicated twice in a completely randomised design. The experiment lasted for a period of eight weeks. Water and feed were supplied ad libitum. Results revealed total weight gain of between 826.00- 895.00g, daily weight gain of 25.66-27.8g, daily feed intake of 53.67-54.65g and feed conversion ratio of 1.95-2.12 during the starter phase. Similarly at the end of the finisher phase final weight was between 2395-2592g, while total weight gained was 1569-1761.5g, daily feed intake was 138.42-151.55g, feed conversion ratio was 2.22-2.65 and mortality (16.35-23.73%). There was no significant effect on the bird's performance by both processing methods and level of Bambaranut inclusion. Thus Bambaranut is considered a suitable alternative protein source that can replace soyabean meal especially at harvest time when the price is low.

KEYWORDS: Bambaranut, Processing methods, Performance, Broilers.

Running title: Bambaranut for broiler feeding.

INTRODUCTION

Nutrition is one of the primary constraints of livestock and poultry production in Nigeria. Ogundipes (1991) showed that feed accounts for about 60- 70% of the total cost of production. This is attributed to the fact that poultry are dependent on feeds stuffs, which are expensive and equally competed for by man as food. The poultry industry is not only facing a rise in the cost of conventional feedstuffs but also a scarcity in their supply.

According to Bamgbose and Tewe (1995) profit maximisation would not be attained unless birds are well fed with balanced diet at economically viable cost. This factor of competition, scarcity and availability at economic cost has necessitated the need for researches into the use of unconventional feedstuffs. One of these unconventional feed trials is the use of Bambaranut (BBN) (*Voandzeia subterranean*) an African indigenous legume. The total African estimated production of the crop as reported by Poulter (1981) is 300,000 tonnes per annum. Major producing countries of the world include Nigeria (100,000 tonnes), Niger

(30,000 tonnes) and Ghana (20,000 tonnes) (Karikai, 1974). The use of BBN as possible feed supplement has received little research consideration. This is in spite of its earlier identification as potential protein and carbohydrate source for poultry and pig feeding (Oyenuga, 1968). Analysis of BBN indicated crude protein of 17.7%, carbohydrate 61.7%, fat 6.3% and crude fibre of 4.9% (Gohl, 1975). The seeds have high lysine content while major limiting amino acids are cystine and methionine (Oyenuga, 1968).

BBN like many other legumes has trypsin inhibitory effect (Liener, 1976). This tends to hinder their use as livestock feed. Onwudike and Eguakun (1994) reported a significant decline in weight gain of broilers fed more than 10% raw BBN in broiler starter diet. The poor performance was attributed to trypsin inhibitory effect. However, they also reported better performance with broiler fed heat-treated BBN supplemented with methionine and cystine. Thus the present study is carried out to test the effects of different heat treatment methods of BBN and different levels of inclusion on the performance of broiler chickens.

MATERIALS AND METHODS.

Location: The research work was conducted at the Abubakar Tafawa Balewa University poultry research farm, Bauchi (latitude 13 N, longitude 11 E).

The BBN was divided into two parts. One part was boiled in water for 60 minutes. After which it was sun-dried. The other part was roasted until it becomes golden brown.

The feed ingredients were mixed into four experimental diets, as shown in tables 1 and 2. Four isonitrogenous diets were formulated. Diet 1 and 3 contained roasted BBN at 15 and 30% level of inclusions respectively while diet 2 and 4 contains boiled BBN at 15 and 30% level respectively.

The starter diets have a crude protein of 23% and metabolizable energy (ME) were 2889, 2889, 2943.48, 2943.48 Kcal ME / Kg diet respectively. While the finisher diets contain 21% CP and ME values of 2945.56, 2945.56, 3001 and 3001 for diets 1,2,3 and 4 respectively. The calculated chemical compositions of the experimental diets are also shown in Tables 1 and 2.

One hundred Anak 2000 broiler chicks were randomly allocated to the four dietary treatments. Throughout the brooding period (0-4 weeks), the chicks were fed starter diet and from 5-8 weeks the birds were fed finisher diet. The experimental design was a completely randomised design.

During the experimental period data were collected on the feed intake, body weight gain, and mortality.

The data generated were subjected to analysis of variance technique (ANOVA) according to Steel and Torris (1980).

RESULTS AND DISCUSSION

The performance of broiler chickens at the starter phase is as presented in table 3. The final and daily weight gain, total and daily feed intake, feed conversion ratio and mortality at the starter phase were not affected by both the processing methods and levels of inclusion. No mortality was recorded during the starter phase of the experiment. This observation is in agreement with Onwudike and Eguakun (1994) that broiler birds fed up to 40% heat treated BBN did not show any significant difference with respect to the rate of weight gain, feed intake and FCR when compared to birds fed control diet. The performances of the broiler chickens at the

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Table 1: Percentage composition of broiler starter diets (1-4 weeks).

Parameters	Diets			
	1 15%RB	2 15%BB	3 30%RB	4 30%BB
Maize	38.10	38.10	28.33	28.33
Soyabean meal	28.90	28.90	23.77	23.77
Bambaranut	15	15	30	30
Fish meal	4	4	4	4
Maize offal	10	10	10	10
Bone meal	2	2	2	2
Limestone	1	1	1	1
Premix*	0.5	0.5	0.5	0.5
Methionine	0.25	0.25	0.25	0.25
Salt	0.25	0.25	0.25	0.25
Total	100	100	100	100

Calculated analysis.

Metabolizable Energy Kcal/ Kg	2889.00	2889.00	2943.48	2943.48
Crude protein (%)	23	23	23	23
Fibre(%)	4.6	4.6	4.6	4.6
Calcium (%)	1.41	1.41	1.41	1.41
Fat (%)	3.0	3.0	2.6	2.6
Phosphorous (%)	0.64	0.64	0.64	0.64

Table 2: Percentage composition of broiler finisher diet (4-8 weeks).

Parameters	Diets			
	1 15%RB	2 15%BB	3 30%RB	4 30%BB
Maize	43.8	43.8	33.89	33.89
Soyabean meal	23.20	23.20	18.05	18.05
Bambaranut	15	15	30	30
Fish meal	4	4	4	4
Maize offal	10	10	10	10
Bone meal	2	2	2	2
Limestone	1	1	1	1
Premix*	0.5	0.5	0.5	0.5
Methionine	0.25	0.25	0.25	0.25
Salt	0.25	0.25	0.25	0.25
Total	100	100	100	100
Calculated Analysis	2945.56	2945.56	3001.00	3001.00
<i>Metabolizable Energy ME Kcal/Kg</i>				
Crude protein (%)	21	21	21	21
Fat (%)	3.02	3.02	3.02	3.02
Fibre (%)	4.41	4.41	4.41	4.41
Calcium (%)	1.41	1.41	1.41	1.41
Phosphorous (%)	0.64	0.64	0.64	0.64

Vit. A 1500 IU; Vit. D3 1600iu, vit E 11.0mg; Riboflavin 9.0mg; Biotin 0.25 mg;
 Pantothenic acid 11.0mg; vit K3 3.0mg; vit B 8.0mg; Nicotinic acid 8.0 mg; Fe 5.0mg;
 10.0mg; Zinc 4.5 mg; Co 0.02 mg; Se 0.01mg.

Table 3: Performance of broiler chicken fed experimental diet at the starter phase. (1-4 weeks).

Parameters	15%RB	15%BB	30%RB	30%BBN	SEM
Final weight (g)	826.00	895.00	883.5	826.00	52.20
Total weight gain (g)	718.50	780	776	718.50	57.75
Daily weight gain (g)	25.66	27.8	27.72	25.66	2.06
Total feed intake (g)	1513.8	1518.8	1502.7	1459.2	28.93
Daily feed intake (g)	54.65	54.21	53.67	53.67	0.76
Feed conversion ratio	2.12	1.95	1.97	2.03	0.43
Mortality (%)	0	0	0	0	0

SEM = Standard error of the mean.
 RB = Roasted Bambaranut.

BBN = Boiled Bambaranut.

Table 4: Performance of broiler chicks fed experimental diets at finisher phase (5-8) weeks.

Parameters	15% RB	15%BB	30%RB	30%BB	SEM
Initial weight (g)	826.00	895.00	883.50	826.00	
Final weight (g)	2587.5	2592.05	2550	2395	55.52
Total weight gain (g)	1761.5	1697.5	1666.5	1569	34.95
Daily weight gain (g)	62.41	60.63	57.52	56.04	2.34
Total feed intake (g)	3875.8	3992.7	4243.6	4006.3	70.59
Daily feed intake (g)	138.42	142.60	151.55	43.08	2.52
Feed conversion ratio	2.22	2.35	2.65	2.56	0.098
Mortality (%)	16.35	20.195	9.88	23.73	9.02

finisher phase showed no significant diet effect on all parameters considered (table 4).

This result is comparable with the findings of Tewe and Ologhobo (1987) whose report on raw and cooked soyabean meal showed that the feed consumption and growth rate were not significant. The similarity of the FCR obtained, for all the dietary treatments suggest efficient utilization of the diets by the birds. This result agrees with that of Dmello and Walker (1990) who fed autoclaved jack bean and Onwudike and Equakun (1994) with heat-treated BBN.

Mortality of up to four birds was recorded for some of treatments during the finisher phase of the experiment. This could not be entirely attributed to dietary treatments, as there was salmonella disease out break during the experiment.

CONCLUSION

Based on the results obtained, the following conclusions were made:

- (i) Boiling and roasting were both effective in destroying the antinutritional factors in BBN.
- (ii) Bambaranut could be included at up to 30% level in broilers diet without compromising performance.
- (iii) Bambaranut appears a good plant protein source and could form substantial dietary protein.
- (iv) This study suggest further work to evaluate higher levels of BBN in Broilers diets.

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