

PERFORMANCE OF BROILER STARTER CHICKEN FED DIETS CONTAINING SHEA BUTTER CAKE (*Vitellaria paradoxa*)

I. S. Harande ¹, R. I. Muhammad ¹, K.M. Ewuola¹, A. M. Sakaba ¹, A. B. Sikiru ¹, S.A. Dabai ¹, I. Ilevbare²

¹Department of Animal Science, Federal University of Agriculture Zuru, Kebbi State Nigeria.

²Department Veterinary Medicine, Federal University of Agriculture Zuru, Kebbi State Nigeria

ABSTRACT

The experiment was conducted to determine the performance of broiler starter chicken fed diets containing Shea butter cake (SBC) (*Vitellaria paradoxa*) was investigated. One hundred and fifty Ross 308 broiler chickens assigned to three (3) dietary treatments with first treatment been the control (0% SBC), second treatment containing 5% SBC and third treatment containing 10% SBC with 5 replicates per treatment and each replicate had 10 birds in a completely randomized design. The experiment lasted for four weeks. Data on feed intake and body weight gain were determine and compared. Feed intake for chicks under control diet (0%) 661.64 g/bird was significantly different ($P<0.05$) to those on diet 2 (5% SBC) 712.24 g/ bird and diet 3 (10% SBC) 870.63 g/bird . Similarly the highest body weight gain (BWG) of 335.77 and 331.64 /bird were obtained from diet 2 (5%) and diet 3 (10%) respectively which differ significantly ($P<0.05$) from the value obtained from diet 1 (10% SBC) 312.83. However the result of mortality showed that there was no significant difference between the treatment mean ($P>0.05$). Feed conversion ratio (FCR) increase with increase in SBC was similar amongst the diffewrent treatments It is concluded that feeding broilers with diet containing SBC enhanced performance.

Key words:- Performance, Broiler, Starter, Diets, Shea butter cake

Introduction

In Nigeria, the poultry feed industry is heavily dependent on grain, such as maize, millet, and sorghum; and oilseed resource such as groundnut cake, soybean cake, cotton seed cake and palm kernel meal (RMRDC, 2003). It has therefore become imperative to explore other alternatives for the feed industry in order to reduce the current stress on human food supply. One of the key agro forestry species in Africa, particularly Nigeria is the shea butter tree, *Vetellaria paradoxas* (*sapotaceae*). The shea tree produces fruits which is cherished and eaten by human and animals, the fruits contain a rich source of ascorbic acids, iron, calcium, and vitamins A and B (Hall *et al.*, 2010). The nut of this fruits is processed to give shea butter oil while the residue or by-products is the shea nut cake (Dei *et al.*, 2008). The shea nut cake is an end products; available in large quantity and is generally disposed of via incineration, because it is considered as ‘useless’ but others use the cake as manure in the farm. Approximately 500,000mt of this cake are produced annually in the savannah region of Africa (Okai and Bonsi, 2010). The aim of this research is to determine the performance of broiler birds fed diets containing shea butter cake as protein supplements at starter phase.

Materials and methods

Study area

The experiment was carried out in Poultry Production Unit Federal University of Agriculture Zuru, Kebbi State, Nigeria the area is geographically situated within latitude 11° 35' - 11° 55' North and longitude 4° 45' - 5° 25' East of the equator covering an area of approximately 461, 884 square mile (Girma, 2004).

Experimental birds

The birds used for this experiment were sourced from Zarm Tech. Farm in Oyo State, Nigeria. One-hundred and fifty (150) Ross 308 broilers day old broiler chicks were purchased and used for this research.

Experimental diets

The experimental diets used for the research was formulated using the available feed ingredients such as maize, shea butter cake, soya bean, groundnut cake, bone meal, vitamin-mineral premix, methionine, lysine and salt (Table 1).

Table 1: Gross and chemical composition of experimental diets

Treatment (shea butter cake)		
T1 (control)	T2 (5 %)	T3 (10 %)

Maize	49.95	48.00	48.00
Shea butter cake	0.00	5.00	10.00
Soya beans meal	20.23	18.00	15.00
Groundnut cake	18.17	16.00	14.00
Wheat offal	8.7	8.00	8.00
Limestone	0.40	0.40	0.40
Bone meal	2.50	2.50	2.50
Premix	0.25	0.25	0.25
Salt	0.30	0.30	0.30
Lysine	0.20	0.20	0.20
Methionine	0.30	0.30	0.30
Total	100	100	100
Chemical composition			
ME (kcal/kg)	3000	3000	3000
Crude protein (%)	23	23	23
Lysine	1.2	1.2	1.2
Methionine	0.6	0.6	0.6
Calcium (%)	1.2	1.2	1.2
Available phosphorus (%)	0.7	0.7	0.7

Experimental design

One hundred and fifty (150) day old broiler chicks were used for the experiment. They were randomly divided into three treatment groups of 50 chicks each. Each treatment was further being divided into 5 replicates, with ten chicks per replicate in a completely randomized design (CRD). Each treatment was fed one of the experimental diets for four weeks.

Data collection

Feed intake was recorded daily by subtracting the left over from the amount given of the previous day. Body weight was monitored weekly and mortality was recorded as it occurs.

Statistical analysis

The data collected was subjected to Analysis of Variance (ANOVA) using the Stat View Statistical Package (SAS 2003).

Results and discussion

The outcome of the research on performance of broiler birds fed diet containing Shea butter cake as protein supplement at starter phase revealed that birds fed diet 1 (0%) inclusion level of Shea butter cake consumed less feed with total amount of 661.64/gram/bird) there was significant difference ($P < 0.05$) compared to diet 2 (5%) and diet 3 (10%) inclusion level (712.24 and 870.63 gram/bird) respectively. Similarly, birds placed on (0%) inclusion level recorded the lowest body weight gain (312.83 gram/bird) compare to 5% and 10% inclusion level (335.77 and 331.64 gram/bird) respectively. The value recorded for diet 2 and 3 (5% and 10%) inclusion level differ significantly ($P < 0.05$) even though the highest value was recorded for diet 2 (5%) (Table 2). However, the result of mortality is similar ($P > 0.05$) and result of Feed conversion ratio (FCR) follow a similar pattern there was no significant difference ($P > 0.05$) and it decreases with increase in shea butter cake inclusion level from 2.63 in diets 3 (10%) to 2.12 in diets 2 (5%) and 2.11 in diet 1 (0%) inclusion level. Even though the best value was recorded for diet 3 (Table 2)

Table 2: Performance of broiler fed diets containing shea butter cake at starter phase

Parameters	T1	T2	T3	SEM $\pm$
Initial body weight (g/bird)	50.00	50.00	50.00	0.00
Final body weight (g/bird)	362.83 ^b	385.77 ^a	381.64 ^a	33.70
Feed intake (g/r)	6616.40 ^b	6366.80 ^a	7599.40 ^a	68.87
Feed intake (gram/bird)	661.64 ^b	712.24 ^a	870.63 ^a	29.19
Body weight gain (g/bird)	312.83 ^b	335.77 ^a	331.64 ^a	24.10
Mortality (%)	0.00	0.00	0.00	29.19
Feed conversion ratio	2.11	2.12	2.62	0.13

^{ab} mean in the same row followed by different super scripts are significant difference ($P < 0.05$)

Performance characteristics

Feed intake was inversely related to the increasing levels of Shea butter cake in the diets, and higher inclusion of SBC does not favour the feed intake of the birds. Esonu *et al.* (2001) and Onu *et al.* (2011) reported that reduction in feed intake is associated with palatability arising from residual anti-nutritional factors and likely high fibre content. Body weight gain has a similar trend to feed intake. The decreased weight gain at higher SBC inclusion level was partly due to low feed intake, which is related to the poor palatability of Shea butter cake diets (Zanu *et al.*, 2012).

The overall feed conversion ratio (FCR) for birds in 0 and 5% inclusion level (2.11) and (2.12) respectively in this study was relatively low compared to 2.62 this finding is similar to the report of Zanu *et al.* (2012) for cockerels fed Shea butter diet. Dei *et al.* (2008) had earlier reported lower FCR of 1.79 for broiler fed unfermented shea butter meal.

Conclusion and recommendations

It is concluded that feeding broiler chicks with diets contain Shea butter cake enhance growth especially when the inclusion level is at 5% inclusion level.

It also recommended that the inclusion of shea butter cake at level not exceeding 5% is recommended. Addition processing method for Shea butter which may reduce the anti-nutritional factors and improve the availability of nutrient for animal consumption is suggested. Further research in the use of Shea butter cake in feeding of other mono gastric animal is suggested.

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