

EFFECT OF GRADED LEVEL OF SHEA NUT CAKE (*Vitellaria paradoxa*) INCLUSIONS ON PERFORMANCE OF BROILER FINISHER

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ABSTRACT

A study was conducted to evaluate the performance of broiler birds fed diets contain Shea butter cake as protein supplement at the finisher phase. Shea butter cake (SBC) at 0% SBC, 5% SBC and 10% SBC, tagged T₁ T₂ and T₃ respectively. A total of one hundred and fifty (150) Ross 308 birds, the experiment groups were replicated five (5) times in each treatment with 10 birds per replicate in a four weeks feeding trial. Feed intake and body weight gain of the birds were determined and compared. Result of feed intake and body weight gain were significantly different (P<0.05) for all treatments while feed conversion ratio showed no significant difference for all the treatments. It is concluded that feeding broiler birds with diets containing Shea butter cake enhance growth especially when the inclusion level is at 5%. It also recommended that the inclusion of Shea butter cake at level not exceeding 5% is recommended. Further research in the use of Shea butter cake in feeding of other mono gastric animal is suggested.

Key words:- Performance, Broiler finisher, Shea butter cake

INTRODUCTION

Feed accounts for 70-80% of total cost of poultry production in Nigeria and this is largely due to the high cost of conventional feed stuffs stemming directly from high demands as staple foods by humans (Esonu *et al.*, 2001). Rapid growth in the poultry industry is having a profound effect on the demand for feed and raw materials (FAO, 2011). In Nigeria, the poultry feed industry is heavily dependent on grains such as maize, millet and sorghum; and oilseed resources 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. Feeding broilers during the early weeks of life represents challenges to nutritionists and flock manager. However one of this study has compare the effect of supplementing Shea butter cake as protein supplement on the performance of broiler starter at 20%, 40%, 50% inclusion level in a single study.

One of the key agro-forestry species in Africa, particularly Nigeria is the shea butter tree, *Vitellaria paradoxa* syn. *Butyrospermum paradoxum* (Sapotaceae). The shea tree produces fruits which is cherished and eaten by humans and animals; the nut of this fruit is processed to give shea butter, while the residue or by product is the shea nut cake (Dei *et al.*, 2008). The shea nut cake is an end product; available in large quantity and generally disposed off via incineration, because it is considered as “useless”. Approximately 500,000MT of this cake are produced annually in the savanna region of West Africa (Okai and Bonsi, 1989). This research is carried out to examine 5% and 10% inclusion level of Shea butter cake.

MATERIALS AND METHODS

Study Area

The experiment was carried out in Poultry Production Unit at Federal University of Agriculture Zuru. 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 was 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 were 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: Gross and chemical composition of experimental diets

Treatment (shea butter cake)			
	T1 (control)	T2 (5 %)	T3 (10 %)
Maize	50.30	52.50	50.00
Soya beans meal	16.00	12.75	6.75
Shea butter cake	0.00	5.00	10.00
Groundnut cake	16.00	16.00	12.00
Wheat offal	14.00	12.25	9.00
Limestone	0.40	0.40	0.40
Bone meal	2.40	2.50	2.40
Vitamin mineral premix	0.25	0.25	0.25
Salt	0.30	0.30	0.30
Lysine	0.30	0.30	0.30
Methionine	0.35	0.35	0.35
Total	100	100	100
Chemical composition			
ME (kcal/kg)	3,000	3,000	3,000
Crude protein (%)	19	19	19
Lysine	0.95	0.95	0.95
Methionine	0.4	0.4	0.4
Calcium (%)	1.0	1.0	1.0
Available phosphorus (%)	0.4	0.4	0.4

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 incidence of 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 boiler birds fed diets contain shea butter cake as protein supplement at finishing phase revealed that birds fed diets 1 (0%) inclusion level of shea butter cake consumed less ($P < 0.05$) feed (64.0g/bird/day) compared to diet 2 (5%) and diet 3 (10%) (112.0 and 123 g/bird/day) respectively. Similarly, birds placed on (0%) inclusion level recorded the lowest body weight gain (930 g/bird) compare to 5% and 10% inclusion level (1668 and 1890 g/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 3 (10%) (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 1.82 in diets 3 (10%) to 1.88 in diets 2 (5%) and 1.93 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 finishing phase

Parameters	Treatment (shea butter cake)			SEM
	T1 (0%)	T2 (5%)	T3 (10%)	

Initial weight(g/bird)	280.0	324.0	268.0	23.15
Final body weight(g/bird)	1210.0 ^b	1992.0 ^a	2158.5 ^a	73.8
Body weight gain(g/b)	930.0 ^b	1668 ^a	1890.5 ^a	52.4
Body weight gain (g/b/d)	33.20 ^b	59.57 ^a	67.51 ^a	2.70
Feed intake (g/b/d)	64.20 ^b	112.0 ^a	123.0 ^a	5.6
Mortality (%)	0.00	0.00	1.00	0.00
Feed conversion ratio	1.93	1.88	1.82	0.11

^{a,b} Means in the same row followed by different superscripts are significantly different ($P < 0.05$).

Performance of Chicks Fed Shea Butter Cake Diet

The improvement in the performance of broilers fed the 5% and 10% inclusion level of SBC compared with other dietary treatment (0%) may be due to low crude fibre which enhance consumption and hence increase in weight of the broilers. The increase trend in growth observed in weekly live body weight as the inclusion of shea butter cake increases is similar to the findings of Olorede and Longe (1999).

Feed intake was inversely related to the increasing levels of shea butter cake in the diets, and higher inclusion of SBC favour the feed intake of the birds. The increase feed intake of broilers on diets containing 5% and 10% SBC may be due to palatability of the SBC meal. Esonu *et al.* (2001) and Onu *et al.* (2011) reported that increase in feed intake is associated with palatability. The increase in feed consumption with increasing levels of shea butter cake meal in this study is similar to the result of Atuahene (1998), and Olorede and Longe (1999).

The overall feed conversion ratio (FCR) for birds in 5% and 10% inclusion level (1.88) and (1.82) respectively in this study was relatively low compared to 1.97 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. The high FCR of the birds fed higher inclusion level of shea butter cake may be due to the inability of the young chicks to tolerate anti-nutritional factors found in the diet. The superior FCR of birds on 5% and 10% SBC inclusion diets to other inclusion level (0%) suggests that there was enhanced availability, digestion, absorption and utilization of the nutrients in the cake by broilers. level. Similar observations have been reported by Dei *et al.* (2008) while feeding broilers with shea butter meal.

CONCLUSION AND RECOMMENDATIONS

It is concluded that feeding broiler birds 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. Additional 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 and carcass analysis and hematological parameters is recommended.

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