

RESPONSE OF BROILER FINISHER CHICKENS FED GRADED LEVELS OF EGUISI MELON SEED CAKE AS REPLACE FOR TOASTED FULLFAT SOYA BEAN MEAL

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ABSTRACT

The experiment was carried out to investigate the effect of graded levels of egusi melon seed cake (EMSC) in the broiler finisher diets as replacement for toasted full fat soya bean meal (TFSB). EMSC was included in the diets at 0 %, 25 %, 50 %, 75 % and 100 % levels and coded as diets 1, 2, 3, 4 and 5 respectively. Two hundred and twenty five (225) five weeks old Ross 308 strains of broilers were used in the experiment in a completely randomized designed (CRD). The result obtained from this research revealed that there was significant ($p < 0.001$) differences in final weight (FW) and daily weight gain (DWG) while no significant ($p > 0.05$) was observed in feed conversion ratio (FCR) and initial weight (IW). The highest daily feed intake was recorded in birds fed diets 2 (130.58 g) while the least was recorded at 100 % level of inclusion of EMSC. The results also showed that birds on diets 2 had the highest total weight gain (1530 g) and daily weight gain (72.86 g) respectively while those on diet five showed the least final weight gain and daily weight gain respectively. Although there was no significant difference recorded on the FCR and Iw, the best FCR was obtained from birds fed diet 2 (1.8) while the poorest result was obtained among those fed diet 4. The study concludes that EMSC can be included up to 25 % in broiler finisher chickens diet without compromising performance.

Keywords: Broiler, Finisher, Chickens, Diets, EMSC.

INTRODUCTION

Broilers remain one of the fastest sources of readily available animal protein human consumption because of rapid growth when given good nutrition and management (Maggawa, *et al.*, 2022). There has been generally scarcity of conventional feed resources especially protein such as soya bean meal and fish meal and where available, sharp increase in price of these products have made their use uneconomical (Adegbonjo, *et al.*, 2020). Therefore, to source, harness, process and utilize alternative feedstuff otherwise known as unconventional feed ingredients in the diet of poultry is more critical now than ever (Bulus, *et al.*, 2014). Eguisi melon seed *Colocynthis citrillus* L. (EMS) is another type of melon seed which is common called Eguisi in West Africa. It is one of the most important vegetable crops in the tropical, sub-tropical and Mediterranean zones of the world (Schippers, 2000). It common names include Egusi in Yoruba, Agushi in Hausa, Epingi or Paragi in Nupe and Eashi in Gwari (Gado, *et al.*, 2019). Ibironke and Adegboye (2013) reported that egusi melon seed cake contains 43.63 % protein, 4.39 % fibre, 5.28 % fat and 5.15 % ash. The objective of this study was aimed at evaluating EMSC dietary protein in the diets of broiler finisher chickens.

MATERIALS AND METHOD

experimental site

The study was conducted at Poultry Production Unit of Gombe State Ministry of Agriculture and Animal Husbandry. Gombe State lies between latitude 9° to 12° North and longitude 8° to 11° East and altitude of 407 meters above sea level. It has a mean minimum and mean maximum temperature of 32.80°C and 18.30°C respectively (Gombe State Government website, 2014).

experimental birds and management

A total of two hundred and twenty five (225) Ross 308 unsexed strains of broiler chicks, were used for the experiment. The chicks were obtained from a reputable hatchery. Feed and water were provided to the birds *ad-libitum* throughout the experimental period. Similarly, all the necessary brooding management practices were duly observed. The birds were vaccinated against infectious bursal disease (IBD) at the age of one week, at two weeks Newcastle disease vaccine was administered and at the third week a 2nd dose of IBD (booster) was administered. This vaccination programme is recommended for North eastern states in Nigeria by (Kimani, 2005).

The experimental diets were compounded using the following ingredients; maize, egusi melon seed cake full fat soya bean meal as variable feed ingredients. Fixed ingredients were wheat offal, fish meal, bone meal, limestone, vitamin premix, table salt (NaCl), Methionine and lysine. Five experimental diets were formulated in which EMSC substituted FFBSM at 0, 25, 50, 75 and 100 % levels and coded as treatment 1, 2, 3, 4 and 5 respectively and the designed used was completely randomized design (CRD). The ingredients and percentage compositions of the experimental diets are presented in table 1.

statistical analysis

All data collected were subjected to analysis of variance using Statistical Package for Social Science Version 21 (11) and where significant differences among treatment means exist, Duncan Multiple Range Test (DMRT) was used to separate the means (SPSS, 2012).

Table1: Ingredients Composition and Calculated analysis of Egusi Seed Meal Based Broiler Finisher Diets at Graded levels

Ingredients	Diets				
	1 (0%)	2 (25%)	3 (50%)	4 (75%)	5 (100%)
Maize	48.53	48.53	48.53	48.53	48.53
Full fat soya bean	26.87	20.15	13.44	6.72	0.00
Egusi melon seed meal	0.00	6.72	13.44	20.15	26.87
Wheat offal	15.00	15.00	15.00	15.00	15.00
Fish meal	5.00	5.00	5.00	5.00	5.00
Bone meal	2.00	2.00	2.00	2.00	2.00
Limestone	1.50	1.50	1.50	1.50	1.50
Premix	0.25	0.25	0.25	0.25	0.25
Salt	0.25	0.25	0.25	0.25	0.25
Methionine	0.30	0.30	0.30	0.30	0.30
Lysine	0.35	0.35	0.35	0.35	0.35
Total	100.00	100.00	100.00	100.01	100.00
<u>Calculated analysis</u>					
Crude protein (%)	21.00	20.97	20.94	20.91	20.87
Metabolizable energy (kcal kg^{-1})	2866.40	2850.12	2832.73	2815.88	22794.56
Crude fibre (%)	4.22	4.67	5.12	5.59	6.09
Ether extract (%)	7.29	7.34	6.37	5.75	5.01
Calcium (%)	1.54	1.53	1.51	1.51	1.50
Phosphorous(%)	0.92	0.90	0.88	0.86	0.84
Methionine (%)	0.68	0.67	0.65	0.64	0.63
Lysine (%)	1.45	1.35	1.20	1.06	0.89

Table 2: Performance of broiler starter chicks fed diets in which EMSC replaced FFSB at varying levels

Parameters	Dietary Treatments					SEM
	T1 (0%)	T2 (25%)	T3 (50%)	T4 (75%)	T5 (100%)	
Initial weight at 4 weeks (g)	636.67	643.33	643.33	633.33	630.00	3.71 ^{NS}
Final weight (g)	1306.67 ^a	1530.00 ^a	1303.33 ^a	1016.67 ^b	510.00 ^c	99.62 ^{***}
DFI (g)	121.77 ^a	130.58 ^a	118.20 ^a	120.67 ^a	88.17 ^b	4.83 [*]
DWG (g)	62.22 ^a	72.86 ^a	62.06 ^a	48.41 ^b	27.94 ^c	4.41 ^{***}
FCR	1.99	1.80	1.90	2.65	2.19	0.18 ^{NS}
Mortality (No)	0	0	0	0	0	

^{a, b, c} Means in the same row with different superscript are significantly different ^{***}($p < 0.001$), ^{*}($p < 0.05$) NS = Not Significant, SEM = Standard Error Mean

Result and Discussion

Table 2 shows the effect of dietary equisi melon seed cake on growth performance of broiler finisher chickens. There was significant ($p < 0.001$) difference in total weight gain (TWG) and daily weight gain (DWG) while the daily feed intake (DFI) was significant ($p < 0.05$). There was no significant ($p > 0.05$) difference in initial weight (IW) and feed conversion ratio. The highest FWG was observed in birds fed diet 2 (1530 g) and the least was observed on birds fed 100 % EMSC (510 g). The DWG and DFI follow the same trend as FWG. The best FCR was observed on birds fed diet 2 (1.8) while the poorest was observed on birds fed 75 % EMSC (2.65).

The result of daily feed intake, initial weight and feed conversion ratio are in tandem with the report of (Shazali, *et al.*, 2013) who reported no significant difference on broiler chickens fed water melon seed meal and full fat soya bean and also in agreement with the report of (Omoikhoje, *et al.*, 2021) who fed broiler chickens small water melon seed meal in place of soya bean meal. The findings of this study with respect to final weight gain and daily weight gain are in concurrence with the findings of (Omoikhoje *et al.*, 2021) who reported better final weight and daily weight gain in broiler chickens fed small water melon seed meal in place of soya bean meal and also in agreement with the report of (Abdourhamane, *et al.*, 2021) who fed *citrillus lanatus* seed cake.

CONCLUSION

Base on the experiment, it has been concluded that EMSC can substitute FFSBM at 25 % in broiler finisher chickens diets with no adverse effect on performance.

RECOMMENDATION

It is recommended that 25 % of EMSC can substitute FFSBM in the diets of broiler finisher chickens as a plant protein source.

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