

PRODUCTIVE PERFORMANCE OF LAYERS FED KAURA SORGHUM REPLACING MAIZE WITH FULL-FAT SOYA BEAN DIETS

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ABSTRACT: The experiment was conducted to evaluate the reproductive performance of layer chickens fed dietary levels of kaura sorghum. Five diets (16% CP) were formulated, in which the Kaura Sorghum was included at 0, 25, 50, 75 and 100% levels and the diets designated as treatments T1, T2, T3, T4 and T5 respectively. Kaura sorghum was used to replace maize as a dietary energy source. Three hundred brown pullets were used for the research. They were allotted to five treatments which were replicated four times each with twenty birds per replicate in a completely randomized design (CRD). After flushing for seven days using the experimental diets, initial weights of the birds in each replicate were recorded. Records of feed intake, number of eggs laid and egg mass were taken on daily basis. The result obtained after the research showed that the final body weight and total feed intake were not affected by the dietary treatments. Birds fed diet 4 (75% kaura sorghum) had the highest feed consumption value of 113.33g while the lowest intake was obtained on diet 1(control) with a value of 91.39g. The highest hen-day egg and hen house egg production (72.59% and 70.00%, $P<0.001$) was obtained on diet 5 (100% kaura sorghum). The best feed conversion ratio (1.42) was found on diet 2 while the poorest was obtained on the maize control diet (1.68), even though the value did not differ statistically. It can be concluded that Kaura sorghum in combination with full fat soya bean can completely (100%) replace maize in the diets of laying hens with no deleterious effects on performance parameters.

Key word: Kaura Sorghum

INTRODUCTION

Maize has been the major source of energy in poultry diets. However inadequate production of maize and the intense competition for maize between man and livestock especially in the drier parts of the tropics has made poultry ration to be very expensive. The high cost of commercial diets for poultry due to high cost of maize as the major ingredients, if not addressed will result to lower income to poultry farmers and reduced protein intake among Nigerian populace. One of the major tasks that can be taken to alleviate such a threat is the use of alternative energy sources like kaura sorghum and millet in the drier areas. Researchers like Parthasarathy *et al.*, (2005); and Issa *et al.*, (2007) have reported that sorghum grains can play an important role in poultry feed in the sahelian countries. Other workers, Hancock, (2000), Dawling *et al.*, (2002) and Travis *et al.*, (2006) have shown that sorghum could be a suitable feed stuff in the poultry industry. Sorghum grain is an interesting energy ingredient in poultry diets due to its nutritional composition which is very similar to maize. Layers are raised purposefully for egg production. They are efficient producers of eggs which provide an alternative source of protein and as such

this gives poultry more advantage over other livestock (Ojo, 2000). More so, it was reported that, egg as a product of poultry industry supply about 3.5g of the total 7.2g of animal protein required for individual dietary needs per day (Nicholas, 2014).

MATERIALS AND METHODS

The research was carried out at the Teaching and Research poultry unit of the School of Undergraduate Studies College of Education Azare between the months of February and March 2015. Azare is located in Katagum Local Government Area of Bauchi State. It is located between latitudes 11° 30' N and 11° 10' E. The mean monthly temperature ranges from 20.10 – 22.50°C in December and January to 30.0 – 32.5°C in April and May. The temperature of the rainy season remains steady at about 25°C – 27°C for the month of June to October. The rainy season in Azare starts in April and lasts upto October with five months of dry season from November to March (Bura, 2000). Five dietary treatments were formulated with kaura sorghum as a replacement for maize using full-fat soyabean as a protein source. Kaura sorghum replaced maize at 0, 25, 50, 75 and 100% in diets 1, 2, 3, 4 and 5 respectively. The full-fat soyabean was mixed with milled kaura sorghum variety and other ingredients to formulate diet with 16% CP. Three hundred (300) brown pullets were used for the research. The birds were allotted to the five dietary treatments which were replicated four times with fifteen (15) birds per replicate in a completely randomized design (CRD). Production performance parameters such as weight change, feed intake, hen day egg production, hen housed egg production and feed conversion ratio were measured. The percent compositions of the various feed ingredients used in formulating the five dietary treatments is presented in Table 1:

Table 1: Ingredients and Percentage Composition of Layer Diets Containing Graded Levels of Kaura Sorghum with Full-Fat Soya Bean as Protein Source

Ingredients	Diets				
	1 (0%)	2 (25%)	3 (50%)	4 (75%)	5 (100%)
Maize	50.00	37.5	25.00	12.50	00.00
Kaura Sorghum	00.00	12.50	25.00	37.50	50.00
Soya bean	16.70	16.70	16.70	16.70	16.70
Wheat offal	20.00	20.00	20.00	20.00	20.00
Fish meal	2.00	2.00	2.00	2.00	2.00
Limestone	7.0	7.0	7.0	7.0	7.0
Bone meal	3.0	3.0	3.0	3.0	3.0
Premix	0.20	0.20	0.20	0.20	0.20
Salt	0.25	0.25	0.25	0.25	0.25
Lysine	0.20	0.20	0.20	0.20	0.20
Methionine	0.30	0.30	0.30	0.30	0.30
Total	100	100	100	100	100
Calculated Analysis					
Crude protein (%)	16.55	16.81	17.05	17.31	17.55
Met.Energy (Kcal/kg)	2551.20	2534.84	2518.34	2501.84	2485.34
Crude fibre (%)	3.66	3.64	3.64	3.64	3.64
Ether extract (%)	3.37	2.87	3.12	1.87	2.87
Calcium (%)	3.71	3.78	3.80	3.89	4.19
Phosphorus (%)	0.60	0.65	0.69	0.72	0.80
Methionine (%)	0.37	0.40	0.42	0.44	0.46

Lysine (%)	0.84	0.84	0.85	0.87	0.89
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Premix **Vitamin-mineral Premix** contains the following per 2.5 kg: Vitamin A 10,000 IU, Vit. D3 2,000,000IU, Vit E 12,000mg, Vit K3 2,000mg, Vit B1 1,500mg, Vit B2 4,000mg, Vit B6 1,500mg, Niacin 15,000mg, Vit B12 10mcg, Pantothenic acid 5,000mg, Folic acid 500mg, Biotin 20mcg, Cholinechloride 100,000mg, Manganese 75,000mg, Zinc 50,000mg, Iron 20,000mg, Copper 5,000mg, Iodine 1,000mg, Selenium 200mg, Cobalt 5000mg, Antioxidant 125,000mg.

RESULTS AND DISCUSSION

The productive performance of layers fed kaura sorghum replacing maize with full-fat soya bean diets is shown in Table 2. The final body weight and total feed intake were not affected by the dietary treatments. Birds fed diet 4 (75% kaura sorghum) had the highest feed consumption value of 113.33g while the lowest intake was obtained on diet 1(control) with a value of 91.39g. The highest hen-day egg and hen house egg production (72.59% and 70.00%, $P < 0.001$) was obtained on diet 5 (100% kaura sorghum). The best feed conversion ratio (1.42) was found on diet 2 while the poorest was obtained on the maize control diet (1.68), even though the value did not differ statistically. The enhanced hen day and hen house egg production on the kaura sorghum diets could be attributed to the quality of the dietary treatments when compared with maize control diets, (Bawa *et al.*, 2003). Also, adequate levels of methionine and lysine have been reported to influence egg production and egg size in laying birds (Bamgbose and Biobaku, 2003).

Table 2: Productive Performance of Layers Fed Dietary Levels of Kaura Sorghum Replacing Maize with Full-fat Soyabean

Parameters	Diets					SEM
	1 (0%)	2 (25%)	3 (50%)	4 (75%)	5 (100%)	
Initial wt (kg)	1.50	1.50	1.51	1.51	1.63	1.03 ^{NS}
Final wt (kg)	2.03	2.04	2.07	2.13	2.05	0.08 ^{NS}
Total feed intake (kg)	5.30	5.74	5.54	6.15	4.25	0.01 ^{NS}
Daily feed intake (g)	91.39 ^b	93.33 ^b	101.61 ^{ab}	113.33 ^a	96.67 ^{ab}	0.47***
Hen-day egg production (%)	61.60 ^b	67.16 ^{ab}	62.22 ^{ab}	62.22 ^{ab}	72.59 ^a	0.26***
Hen housed egg production (%)	60.00 ^b	65.00 ^{ab}	60.00 ^b	60.00 ^b	70.00 ^a	0.45***
Feed conversion ratio (FCR)	1.68	1.50	1.55	1.42	1.50	0.03 ^{NS}
Mortality (Number)	0	0	0	0	0	-

abc = Means bearing same superscripts within the rows are statistically similar (***) = $p < 0.001$

SEM = Standard Error of Mean, NS = Not significant ($p > 0.05$)

CONCLUSION AND RECOMMENDATION

From the results obtained in this research it can be concluded that Kaura sorghum in combination with full fat soya bean can completely (100%) replace maize in the diets of laying hens with no deleterious effects on performance parameters. Hence use of Kaura as source of energy in the diets of laying hens is recommended.

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