PERFORMANCE OF BROILER CHICKENS FED RED SORGHUM VARIETY REPLACING MAIZE AT THE STARTER PHASE

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ABSTRACT
The study was designed to investigate the performance attributes of chickens fed different levels of red sorghum variety as replacement for maize. Two hundred and twenty five (225) unsexed day old broiler chicks were allotted to five treatments containing red sorghum replacing maize at 0,25,50,75 and 100% levels of inclusion designated as diets 1,2,3,4 and 5 respectively in a completely randomized design (CRD). The results obtained after the research did not show any significant difference across the five diets. It is concluded that red sorghum variety can completely (100%) replace maize without compromising productive performance. Red sorghum variety is recommended as a suitable alternative to maize as dietary energy source in broiler chickens production.

INTRODUCTION

Livestock consumes more than a third of all the world's grains particularly maize (Omale and Igwe, 2006). Maize has remained the chief source of dietary energy in compound feeds and constitutes about 50-60% in most poultry diets. Despites its worldwide production, a stiff competition for the usage of maize by humans, livestock and industries persists. This is simply because, maize is high in energy and forms the standard (100) against which other cereal grains is compared (Atteh, 2002). Sorghum (*sorghum bicolor*) is a drought tolerant crop able to withstand a wide range of environmental conditions and has limited industrial uses in Nigeria.This high demand for maize by man and consequently the high prices has made the use of other alternative energy sources like Red sorghum imperative. Sorghum grain has proven to be a suitable feedstuff for use in animal diets (Hancock, 2000; Dowling *et al.*, 2002; Cramer *et al.*, 2003; Travis *et al.*, 2006; Medugu *et al.*, 2010). One major constraint to the use of sorghum in poultry feeding is its tannin content which exerts anti-nutritive on birds.

MATERIALS AND METHODS

Experimental site:

The experiment was conducted at the poultry unit of the Teaching and Research Farm of the College of Agriculture and Animal Science, Mando-Kaduna Division of Agricultural Colleges, Ahmadu Bello University, Zaria. Kaduna State is located within the North-West Geo-Political Zone of Nigeria. Kaduna State is found in the Northern Guinea Savannah Zone of Nigeria (COMPASS, 2009). The state has two main seasons; dry and rainy seasons. The rainy season covers the month of April-October and the dry season covers November-March. The mean annual rainfall is 700-900 mm for the Northern Zone, 690-1031 mm for the Central Zone and 900-1300 mm for the Southern Zone (KADP, 2003). The temperature ranges from 24.4^{o}C to 30.4^{o}C, with the hottest months being March and April while the coldest months are December and January. August use to record the highest relative humidity (99%) and February has the lowest (57%) (KADP, 2003).

Experimental Diets

Five experimental diets of 23% CP were formulated in which red sorghum variety replaced maize at 0, 25, 50, 75 and 100% levels coded as diets 1,2,3,4 and 5 respectively. Yellow maize was replaced by red sorghum as the source of energy while the major sources of protein in the diets were roasted full-fat soya beans (FFSB) and fish meal. The percent and proximate compositionsof the experimental diets are presented in Table

Table 1: Ingredients and Calculated Analysis of Diets Containing Different Energy Sources Fed toBroiler Chickens at theStarter Phase (1-4 weeks of age)

	Diets				
Ingredients	**T1(0%)**	**T2(25%)**	**T3(50%)**	**T4(75%)**	**T5(100%)**
Yellow maize	47.00	35.25	23.50	11.75	0.00
Red sorghum	0.00	11.75	23.50	35.25	47.00
Roasted soya bean	33.50	33.50	33.50	33.50	33.50
Wheat offal	10.00	10.00	10.00	10.00	10.00
Fish meal	5.00	5.00	5.00	5.00	5.00
Limestone	1.50	1.50	1.50	1.50	1.50
Bone meal	2.00	2.00	2.00	2.00	2.00
Salt	0.25	0.25	0.25	0.25	0.25
+Premix	0.20	0.20	0.20	0.20	0.20
Lysine	0.25	0.25	0.25	0.25	0.25
Methionine	0.30	0.30	0.30	0.30	0.30
Total	**100**	**100**	**100**	**100**	**100**
Calculated Analysis					
Crude protein (%)	23.00	23.00	23.00	23.00	23.00
ME(Kcal/kg)	2926.58	2910.84	2895.09	2879.35	2863.60
Ether extract (%)	4.18	4.48	3.92	4.04	3.83
Crude fibre (%)	4.37	4.70	3.62	4.09	3.93
Calcium (%)	1.72	1.73	1.82	1.73	1.73
Phosphorus (%)	0.95	0.95	0.96	0.95	0.96
Lysine (%)	1.57	1.57	1.56	1.48	1.54
Methionine (%)	0.76	0.75	0.75	0.84	0.74

+NB: A bio-organics nutrient supplement containedVit. A; 4000000 i.u,Vit. D3; 800000 i.u, Vit. E; 9200mg; Niacin 11000mg; Vit.B2 2000mg; Vit.B6, 1200mg; Vit.B12 6mg; Vit. K3 800mg; Pantothenic acid 3000mg; Biotin 24mg; Folic acid 300mg; Choline Chloride 120000mg; Cobalt 80mg; Copper 1200mg; Iodine 400mg; Iron 8000mg; Manganese 16000mg; Selenium 80mg; Zinc 12000mg; Anti-oxidant 1250.00mg.

Experimental Birds:
Two hundred and twenty-five (225) Armor breed of broiler chickens were used for the research. They were allotted to the five treatments in three replicates with fifteen birds per replicate in a completely randomized design (CRD).

RESULTS

The performance of broiler chickens fed dietary levels of red sorghum variety is presented on Table 2. All the performance parameters (Daily feed intake, Daily weight gain and Feed conversion ratio) were not affected by the dietary treatments. This finding is in conformity with the reports of Nyannor *et al.* (2007) who stated that the growth performance of broiler chickens was equally supported by maize and sorghum, since sorghum grains compares quite favorably with maize in terms of nutritional quality. It is also similar to the reports of Kawu (2010), who stated that low tannin sorghum is similar to maize in its nutritional value and gives response equivalent to that observed in maize diets.

Table 2: Performance of Broiler Chickens Fed Red Sorghum Variety Replacing Maize at the Starter Phase (1-4 weeks)

Parameters	Diets					
	T1(0%)	T2(25%)	T3(50%)	T4(75%)	T5(100%)	SEM
Daily feed intake (g)	66.54	67.66	71.35	69.04	67.87	1.42 NS
Daily weight gain (g)	21.17	23.78	24.44	23.09	22.05	1.44 NS
Feed conversion ratio	3.20	2.85	2.94	3.01	3.10	0.19 NS
Mortality (Number)	3	2	0	0	3	-

SEM= Standard Error of Mean, NS= Not Significant

DISCUSSION

The productive performance of broiler chickens fed red sorghum based diets showed no significant differences in the starter. This indicates that red sorghum variety can substitute maize weight for weight in the diets of broiler chickens without compromising the performance of broiler birds.

CONCLUSION AND RECOMMENDATION

It is concluded that red sorghum variety can completely (100%) replace maize without compromising productive performance. Red sorghum variety is recommended as a suitable alternative to maize as dietary energy source in broiler chickens production.

REFERENCES

Atteh, J. O. (2002). **Principles and Practice of Livestock Feed Manufacturing.***Adlek Printers,* Ilorin, Nigeria. Pp. 13-17.

Cramer, K. R., K. J., Wilson, J. S. Moritz and R. S. Beyer, (2003). Effect of sorghum based-diets subjected to various manufacturing procedures on broiler performance. *J. Appl. Poult. Res*., **12:** 404-410.

Dowling, L. F., C. A. and B. R. Hamaker (2002). Economic viability of high digestibility sorghum as feed market broilers. Agron. J., **94:** 1050-1058.

Hancock, J. D., (2000). Value of sorghum and sorghum co-products in the diets of livestock. In: Sorghum Origin, History, Technology and Production (W. Smith and R.A. Fredericksen, Eds.), Wiley Series Crop Science, pp: 731-751.

Kaduna State Agricultural Development Project (KADP) (2003). Annual Report.

Kawu, Y. U. (2010). Replacement value of gayamba millet variety for maize in broiler chickens diets. Unpublished MSc Thesis, Abubakar Tafawa Balewa University,Bauchi, Nigeria.

Medugu, C. J., I. D. Kwari, J. U. Igwebuike, I. Nkama, I. D. Mohammed and B. Hamaker, (2010). Carcass and blood components of broiler chickens fed sorghum or millet as replacement for maize in the semi-arid zone of Nigeria. *Agricultural sand Biological Journal of North America,* **1:** 326-329.

Nyannor, E.K.D., Adedokun, S.A., Hamakeg, B.R., Ejeta, G. and Adeola, O. (2007): Nutrtional and evaluation of high digestibility sorghum for pigs and broiler chickens *Journal of Animal Science.* **85:**196 – 203.

Omale, O. A. and Igwe, C. U. (2006).The nutritive, anti-nutritive, and hepatoxic properties of sorghumin Nigeria.*Pakistan Journal of Nutrition,***7**(1):85- 89.

Travis, D. K., M. R. Tuinstr and J. D. Hancock, (2006). Variation in nutritional values of sorghum hybrids with contrasting seedweights characteristics and comparisons with maize in broiler chicks. Crop Science, **46:** 695-699