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GROWTH PERFORMANCE OF BROILER STARTER CHICKENS FED *MAIWA* MILLET (*PENNISETUM GLAUCUM* L.) AS A REPLACEMENT FOR DIETARY MAIZE

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ABSTRACT
The geometric increase in consumer price for poultry and poultry products in Nigeria occasioned by increase in prices of conventional feed ingredients' such as maize and soya bean, need to be looked into. Accordingly, this study was conducted to evaluate the replacement value of *Maiwa* millet for maize in broiler starter diets. A total of 300 broiler chicks weighing between 130.53 and 138.50g were allotted to five starter diets (23.00 % CP) in replicates of four containing 15 birds each in a completely randomized design. Feed and water were provided *ad libitum* and the experiment lasted for 4 weeks. In the diets, which were coded as T1, T2, T3, T4 and T5, *Maiwa* millet replaced maize at 0, 25, 50, 75 and 100 % levels respectively. The parameters studied were daily feed intake, daily weight gain, feed conversion ratio, final weight and mortality. Results showed no significant differences (P>0.05) among diets in all the performance parameters. Daily feed intake ranged from 46.43 to 47.22g, daily weight gain, from 26.58 to 29.06g, while feed conversion ratio values varied between 1.61 and 1.76. Final weight of birds spanned from 876.25 to 950.04g. It was therefore concluded that *Maiwa* millet can completely replace maize in starter broiler diets without compromising growth performance.
Key Words: Performance, starter, broiler, *Maiwa* millet, maize.

INTRODUCTION
Broiler chicken production has been identified as one of the formidable sources of dietary animal protein in the average Nigerian's diet. It also provides employment opportunities and helps to alleviate poverty (Parveen *et al.,* 2017). However, the problem of increased prices of conventional feed ingredients used in feed formulation has been an outstanding bottleneck. According to Adamu *et al* (2012), this predicament can partly be attributed to the effect of climate change and higher prices of inorganic fertilizer. This underscores, the need to explore the use of alternative energy sources to replacement the conventional ones. Previous research works with pearl millet (Niranjan and Yadav, 2009; Tok *et al.,* 2018) have shown that maize can be substituted with pearl millet in poultry diets without negatively affecting growth performance. However, available data on the utilization of *Maiwa* millet by broiler chickens remained scanty. *Maiwa* millet is a pearl millet variety grown in Northern Nigeria. Like other varieties of pearl millet, it does well on marginal soils with low fertility and moisture levels. The objective of this study was therefore to evaluate the performance of starter broiler chickens fed diets containing *maiwa* millet as replacement for maize.

MATERIALS AND METHODS
Experimental site
The research was carried out at the Agricultural Farm, Federal College of Education, Pankshin, Plateau State. The GPS location of Pankshin is latitude 9°N and longitude 9.92°E. The area has minimum and maximum temperatures of 10°C and 27ºC respectively (Dafur *et al.,* 2008).

Experimental Birds and their management

A total of three hundred 14 day-old broiler chickens of the cobb strain, weighing between 130.53 and 138.50 g were allotted to five diets in replicates of four containing 15 birds each in a completely randomized design. Feed and clean drinking water were provided *ad libitum* throughout the experimental period which lasted for 4 weeks.

Experimental diets

Five experimental starter diets (23% CP) were compounded in which *Maiwa* millet replaced maize at 0, 25, 50, 75 and 100% levels coded as diets T1, T2, T3, T4 and T5 respectively. Other ingredients contained in the diets were full fat soya bean, fish meal, wheat offal, bone meal, limestone, premix, salt, methionine and lysine (Table 1).

Data Collection

Data for growth performance which include; daily feed intake (DFI), daily weight gain (DWG), feed conversion ratio (FCR), final weight and mortality were collected. Daily feed intake was obtained by difference between quantities of feed offered and the left-over retrieved the following morning. Weight gain was determined by the difference between two consecutive weighing carried out on weekly basis. This value was divided by 7 to obtain the DWG while FCR was computed by dividing DFI with DWG. Mortality was recorded as it occurred.

Data Analysis

All Data was subjected to ANOVA using the SPSS vr. 25 (2017) statistical software. Where means differed among diets, Duncan Multiple Range Test (DMRT) was used to separate them.

Table 1: Ingredients composition of Broiler Starter Diets (3 – 6 weeks) fed *Maiwa* Millet as replacement for Maize

*Vit/mineral premix supplied/Kg of Diet: Vit. A, 8,500IU; Vit. D_3, 2,000IU; Vit. E, 10mg; Vit. K_3, 1.5mg; Vit. B_1, 1.6mg; Vit. B_2, 4mg; Niacin, 20mg; Pantothenic acid, 5mg; Vit. B_6, 1.5mg; Vit. B_{12}, 0.01mg; Folic acid, 0.5mg; Biotin, 0.75mg; Chlorine chloride, 175mg; Cobalt, 0.2mg; Copper, 3mg; Iodine, 1mg; Iron, 20mg; Manganese, 40mg; Selenium, 0.2mg; Zinc, 30mg and Antioxidant, 1.25mg.

RESULTS AND DISCUSSION

Performance of starter broilers fed diets containing *Maiwa* millet as replacement for maize is presented in Table 2. There were no significant differences (P>0.05) in all the performance indices studied. This contradicts Yunusa *et al.* (2015) who reported significant (P<0.05) differences using *dauro* and *gero* millets. It is also contravenes the report of Kawu *et al.* (2016) where gayamba millet replaced maize at 0, 25, 50, 75 and 100% levels. Initial weight of birds ranged between 130.53 and 138.50g on T3 and T2 respectively. Final weight was between 876.25g on T1 and 950.04g on T5. Numerical values for daily feed intake spanned from 46.43g (T3) to 47.22g (T2) while daily weight gain, which was also not significantly influenced, was between 26.58g on T1 and 29.06g on T5. These values are comparable with 41.23 – 48.06g for daily feed intake and slightly higher than 17.53 – 22.87g for daily weight gain reported by Kawu *et al.* (2020) using whole grain *gayamba* millet to replace milled form in broiler starter diets. Feed conversion ratio of birds ranged from 1.61 to 1.76 on T5 and T1 respectively. Mortality of only one (1) was recorded on T3

Table 2: Performance of starter broiler chickens fed dietary levels of *maiwa millet* as replacement for maize

	Levels of replacement of maize with *Maiwa* millet (%)				
Ingredients	**0 (T1)**	**25 (T2)**	**50(T3)**	**75 (T4)**	**100 (T5)**
Maize	44.14	33.10	27.07	11.04	0.00
Maiwa Millet	0.00	11.04	27.07	33.10	44.14
Full fat soya bean	37.86	37.86	37.86	37.86	37.86
Wheat offal	10.00	10.00	10.00	10.00	10.00
Fish meal	4.00	4.00	4.00	4.00	4.00
Bone meal	2.00	2.00	2.00	2.00	2.00
Limestone	1.00	1.00	1.00	1.00	1.00
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	0.20	0.20	0.20	0.20	0.20
Total	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
Calculated Analysis					
Metabolizable Energy (kcal/kg)	2867.54	2859.08	2852.67	2845.32	2837.18
Crude Protein (%)	23.00	23.08	23.12	23.16	23.19
Crude Fibre (%)	4.13	4.55	5.00	5.40	5.18

Parameters	0	25	50	75	100	SEM
Initial weight (g)	131.87	138.50	130.53	132.96	136.29	3.15 NS
Final weight (g)	876.25	942.59	936.09	929.01	950.04	24.34 NS
Daily feed intake (g)	46.63	47.22	46.68	46.97	46.43	0.36 NS
Daily weight gain (g)	26.58	28.71	28.77	28.43	29.06	0.85 NS
Feed conversion ratio	1.76	1.66	1.65	1.66	1.61	0.05NS
Mortality	0	0	1	0	0	-

NS = Not significant, S E M = Standard Error of the Mean

CONCLUSION AND RECOMMENDATION

Based on the results of this study, it was concluded that *Maiwa* millet can completely replace maize as dietary energy source in starter broiler chicken diets without adverse effect on growth performance. Accordingly, *Maiwa* millet is recommended as an alternative energy source in broiler starter diets.

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