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Performance and Carcass Characteristics of Broiler Chickens Fed Maize and Millet Diets at Finisher Phase

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Abstract
This study aimed to determine the performance and carcass yield of broiler chickens fed a diet containing maize (*Zea Mays*) substituted with millet (*Pernnisetum pedecelatum*). Forty-five (45) broiler chickens were randomly allotted to five diets in which maize replaced millet at 0, 20, 40, 60 and 80% dietary levels designated as treatment 1,2,3,4 and 5 respectively. The experiment lasted within the periods of 4 weeks (Finisher phase). The result of the performance showed significant ($p<0.05$) difference in the final body weight (2333.3 – 2200.0 g), daily weight gain (56.07 – 38.21 g) and feed conversion ratio (4.34 – 2.84 g). There were no significant differences ($p>0.05$) in daily feed intake (167.00 - 153.33 g). Significant difference was observed in the carcass weight (162.7 0 128.0 g) and heart weight (8.78 – 5.52) this indicate that maize could be replaced with millet in broiler chickens diets.

Keywords: Performance, carcass characteristics, maize, millet, finisher phase

Introduction

The broiler chickens industry has now occupied the second place in volume in the world just after pork (Yang and Jiang, 2005) that represent about 29% of the total meat production from farm animals and is rising every year (Mckay *et al*., 2000). The growth of poultry production has been based on strong consumer demand for products that are cheap, safe and healthy. The intensification and commercialization of poultry sector were accelerated by discoveries in the field of breeding, nutrition, housing management and disease control (Sasidhar, 2006). Maize is the major source of energy in poultry feeds because of its high starch content giving it about 3400 Kcal /kg (Olomu, 2011).

Therefore, this study aimed to determine the growth performance, nutrient digestibility and carcass yield of broiler chickens fed millet and maize diets at finisher phase (5 – 9 weeks).

Materials and Methods

The experiment was conducted at the Teaching and Research Farm of the Department of Animal Science, Faculty of Agriculture and Agricultural Technology, Kano University of Science and Technology, Wudil, located in the Sudan Savannah Zone of Nigeria. The farm is located on latitude 11^{o} 37^{1}N longitude of 8^{o} 53^{1}E at an altitude of 403m above the sea level with an average annual rainfall of 890mm and average temperature of 26^{o} (Olofin *et al*., 2008). A total of forty-five (45) day old chicks (marshal) from Obasanjo Farm were used. Chickens were weighed and randomly allocated into pens. Feed, water was given *ad libitum.* Five diets were formulated in which millet replaced at 0, 20, 40, 60, and 80 percent levels designated as Treatments 1, 2, 3, 4 and 5 respectively. Experimental diets were given *ad libitum* throughout the experimental periods and leftovers feed were measured on daily basis.

Data obtained were subjected to analysis of variance (ANOVA) as reported by Steel and Torrie (1980) where significant difference observed means were separated using Least Significance difference (LSD).

Result s and Discussion

The result of growth performance of broiler chickens feed maize and millet at finisher phase is presented in Table 1. Significant ($p>0.05$) difference were observed in initial body weight, final body weight values range from 1833.3 to 2333.3 g with treatment 4 recorded the highest values when compared with other treatments groups Al-Haidary (2004); Chauynarong *et al.*(2009), reported the same values in Shika brown chicken in semi-arid zone of Nigeria. The daily weight gain was significantly ($p<0.05$) different, higher in treatment 4 (56.07 g), and lowest value of (38.21 g) were recorded in treatment 3.

Table 1: Performance of broiler chickens fed maize and millet diet at finisher phase

Parameter	Treatments					SEM
	T_1 (0%)	T_2 (20%)	T_3 (40%)	T_4 (60%)	T_5 (80%)	
Initial body weight (g)	755.00	752.89	763.33	763.33	761.33	9.53^{NS}
Final body weight (g)	2267.0^{a}	2300.0^{a}	1833.3^{b}	2333.3^{a}	2200.0^{a}	77.43
Daily weight gain (g)	54.00^{a}	46.17^{ab}	38.21^{b}	56.07^{a}	51.38^{a}	3.28
Daily feed intake (g)	153.33	161.67	167.00	164.33	161.00	4.80^{NS}
Feed conversion ratio (g)	2.84^{b}	2.95^{b}	4.343^{a}	2.94^{b}	3.14^{b}	0.13
Feed cost weight gain (g)	245.21^{b}	257.78^{b}	369.73^{a}	235.92^{b}	251.96^{b}	10.82
Mortality	0	0	0	0	0	

^{abc}: means with different superscript on the same row are significantly different (P < 0.05) SEM =Standard error of means NS = Not significant

Table 2: Carcass characteristics of broiler chickens fed diet containing maize and millet

Parameter	Treatments					SEM
	T_1 (0%)	T_2 (20%)	T_3 (40%)	T_4 (60%)	T_5 (80%)	
Final live weight (g)	2267.0^{a}	2300.0^{a}	1833.3^{b}	2333.3^{a}	2200.0^{a}	77.43
Carcass weight (g)	1450.0^{ab}	1443.3^{ab}	1266.7^{b}	1626.7^{a}	1228.0^{b}	72.13
Dressing percentage (%)	63.38^{bc}	62.96^{bc}	69.10^{ab}	71.66^{a}	60.41^{c}	1.970
Breast muscle (g)	520.00^{ab}	400.00^{b}	460.00^{ab}	586.67^{a}	486.67^{ab}	46.95
Drumsticks (g)	220.00	193.33	226.40	263.33	193.33	23.57^{NS}
Thigh (g)	226.67	226.67	256.67	300.00	236.67	37.98^{NS}
Wings (g)	200.00^{ab}	150.00^{c}	216.67^{a}	159.00^{bc}	139.33^{c}	15.15
Back (g)	353.33^{ab}	330.00^{ab}	376.67^{ab}	440.00^{a}	306.67^{b}	36.42
Abdominal fat (g)	17.68	15.88	9.740	12.000	10.67	2.78^{NS}

^{abc}: Means with different superscript on the same row are significantly different (p< 0.05) SEM =Standard error of means NS = Not significant

Table 3: Organ characteristics of broiler chickens fed diet containing maize and millet

Parameter	Treatments					SEM
	T_1 (0%)	T_2 (20%)	T_3 (40%)	T_4 (60%)	T_5 (80%)	
Hearts (g)	6.75^{ab}	5.52^{b}	6.37b	8.78^{a}	6.17^{b}	0.68
Lungs (g)	8.80^{a}	7.43^{ab}	8.62^{a}	9.45^{a}	5.33^{b}	0.89
Liver (g)	43.03^{a}	38.50^{ab}	39.15^{ab}	45.42^{a}	31.17^{b}	2.10
Pancreas (g)	2.80	3.90	2.80	3.50	4.44	0.56^{NS}
Kidney (g)	8.27^{a}	4.23^{bc}	5.65^{b}	6.19^{ab}	2.10^{c}	0.74
Small intestine weight (g)	32.24^{a}	27.29^{ab}	29.98^{ab}	26.81^{ab}	26.05^{b}	1.74
Small intestine length (g)	176.00^{a}	162.33^{b}	174.00^{ab}	169.67^{ab}	168.67^{ab}	3.75
Large intestine weight (g)	15.55	13.58	14.66	14.18	12.52	0.95^{NS}
Large intestine length (g)	45.33^{a}	34.67^{b}	38.33^{ab}	40.00^{ab}	35.67^{b}	2.13
Spleen (g)	1.07^{b}	1.68^{ab}	1.36^{ab}	1.80^{a}	1.37^{ab}	0.21
Proventriculus (g)	7.02	7.20	7.52	7.20	7.66	0.67^{NS}
Crop (g)	6.30	5.68	5.30	7.28	9.05	1.19^{NS}
Gizzard (g)	28.52	23.05	24.88	28.71	26.25	2.57^{NS}

$^{abc:}$ Means with different superscript on the same row are statistically different (P < 0.05)SEM = Standard error of means NS = Not significant

Recommendation

It is therefore recommended that millet (*Pennesetum pedicellatum*) could be substituted with maize (*Zea mays*) in the diets of broiler chickens up to 60% level of inclusion without any deleterious effect on the live weight, dressing percentage, carcass weight, feed conversion ratio, daily weight gain, final body weight and organs weight.

Reference

Mcka, J.C., Barton, N.F., Koerhuis, A.N.M. and Mcadam, J. (2000). Broiler production around the world. Proceeding of 21 world's poultry congress (CD – Rom). Montreal, Canada.

Olofin. E.A, Nabegu, A.B. and Danbazau, M.A. (2008). Wudil within Kano region. A geographical synthesis 1st edition, AdamuJoji publishers. Department of Geography, KUST, Wudil.

Olumu, J.M. (2011). Monogastric Animal nutrition: Principle and practice, 2nd edition, Jackson publishers. University of Benin, Nigeria. pp 169-177

Sasidhar, P.V.K. (2006). Research priorities in Poultry Genetics and Breeding to 2020. Proceeding of National Seminar, Nov. 2 - 3, Central Avian Research Institute, Indian Council of Agricultural Research, Izatnagar – 243 122 (U.P), India, pp: 1 – 339.