

RESPONSE OF BROILER CHICKENS TO DIETARY LEVELS OF MAIZE OFFAL

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ABSTRACT

A study aimed at investigating the response of broiler chickens fed dietary levels of maize offal at both starter and finisher phase. Proximate analysis were conducted and the results reveal that maize offal contain ME - 3253.11 Kcal/kg, DM - 10.46, CP - 10.98, CF - 8.68, EE - 3.10, Ash - 3.19, and NFE-72.08%. Five diets were formulated in which maize replaced wheat offal at 0, 25, 50, 75 and 100% levels designated as T1, T2, T3, T4 and T5 respectively. Throughout the experimental period, birds were fed ad libitum. Two hundred and fifty day old Anak 2000 breed of broiler chickens were used for the experiment. The feeding trial indicated that birds fed diet 1 had a significantly ($P>0.05$) lower average daily weight (27.19g) than other treatments at the starter phase but no significant ($P>0.05$) difference were observed on daily feed intake, and feed conversion ratio. At the finisher phase, there was no statistical ($P>0.05$) difference on daily feed intake, daily weight gain and feed conversion ratio of the birds. The feed cost in naira per kg and feed cost per kg decreases with increased level of maize offal. Diet 5 recorded the least feed cost of N112.09/kg and the highest cost savings of N103.60. It can therefore be concluded that, maize offal can replace wheat offal in the diets of broiler chickens at 100% level without adverse effect on performance, with a notable reduction in feed cost by 32.4 %.

INTRODUCTION

An advanced knowledge of poultry nutrition is not, by itself alone, an assurance that the management of poultry will be profitable. However, a fair knowledge of poultry nutrition will definitely promote the efficiency of management operations and in fact, many cases of business failure can be traced to poor feeding of the birds (Oluyemi and Roberts, 2013). Poultry birds especially broilers plays a significant role in the provision of animal protein required by man to meet his daily protein intake (Maidala and Istifanus, 2012). Daily protein intake in Nigeria is 6.5 grams per capital per day (Marquist, 1985) Maximum production of mono-gastric animals like poultry, which does not require a long period of time to mature with minimum space can meet this requirement. High cost of conventional feed stuff most especially protein and energy sources has been one of the major challenges of intensive poultry production in developing countries like Nigeria (Ani, 2008). The purpose of the study was to assess the replacement value of maize offal for wheat offal.

MATERIALS AND METHODS

Site of study: This study was conducted at the Abubakar Tafawa Balewa university Poultry Teaching and Research Farm Bauchi, Bauch state. Nigeria.

Chemical Analysis

A sample of maize offal was analysed for proximate composition according to the methods of the Association of Official Analytical Chemists (AOAC,2004) for determination of ME Kcal/kg, and percentage CP Ash, EE,CF and NFE. The result is on table 3..

Experimental Birds and Management

Two hundred and fifty day old Anak 2000 breed of broilers were used for the study. The chicks were brooded for 4 weeks and vaccinated against Gumboro and New castle diseases. At first week, the birds were fed with commercial diet. On the 8th day, the birds were randomly allotted into 5 dietary treatments described as treatments 1, 2, 3, 4 and 5 (0, 25, 50, 75 and 100% maize offal respectively, consisting of 50 birds per treatment and each treatment had 3 replicates, consisting of 16 or 17 birds per replicate.. Throughout the experimental period, feed and water were provided ad libitum

Experimental Diets:

Five experimental diets were formulated, and maize offal replaced wheat offal at 0, 25, 50, 75 and 100% level called diets 1, 2, 3, 4 and 5 respectively. The ingredients used for the experiment were locally procured. The composition of starter and finisher diets are presented on table 1 and 2.

Table 1 Ingredients and Calculated Analysis of Starter Diet (week 1-4)

Ingredients	DIETS				
	T1 (0%)	T2 (25%)	T3 (50%)	T4 (75%)	T5 (100%)
Yellow Maize	48.3	47.9	47.47	47.07	46.63
Full fat soya bean	22.30	22.70	23.13	23.53	23.97
Groundnut cake	10.00	10.00	10.00	10.00	10.00
Maize offal	0.00	2.50	5.00	7.50	10.00
Wheat offal	10.00	7.50	5.00	2.50	0.00
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
Salt	0.25	0.25	0.25	0.25	0.25
Premix	0.25	0.25	0.25	0.25	0.25
Methionine	0.20	0.20	0.20	0.20	0.20
Lysine	0.20	0.20	0.20	0.20	0.20
Total	100	100	100	100	1000
Calculated Analysis					
Crude protein	23.00	23.00	23.00	23.00	23.00
ME (kcal/kg)	2987.56	3002.78	3017.96	4720.68	3048.35
Ether Extract	7.12	7.15	7.17	7.19	7.21
Crude fibre	3.60	2.74	3.80	3.89	4.00
Calcium	1.64	1.69	1.68	1.68	1.67
Phosphorus	0.61	0.78	0.61	0.60	0.59
Lysine	1.22	1.22	1.22	1.21	1.21
Methionine	0.40	0.40	0.39	0.40	0.40

Bio- organic broiler starter premix containing vitamin A- 10,000,000.00 mu, Vitamin D3- 2000,000.00 mu, Vitamin E- 20,000.00mg, Vitamin K3-2,000.00mg, Vitamin B1- 3000.mg, Vitamin B2- 5000.00 mg, Niacin-45,000.00 mg, Calcium paratetheunate-10,000.00 mg, Vit. B6- 4000.00 mg, Vit B12- 20.00 mg, Choline chlorate-300,000.00mg, Folic acid 1000.00mg, Biotin 50-.00mg Manganese;-300,000.00 mg, Iron- 120,000.00 mg, Zinc- 80,000.00 mg, Copper- 8500.00, Iodine- 1500.00 mg, Cobalt-3000.00 mg, Selenium- 120.00 mg, Anti-oxidant-120,000 mg was added.

Table 2 Ingredients and Calculated Analysis of Finisher Diets (week 5-8)

Ingredients	DIETS				
	T1 (0%)	T2 (25%)	T3 (50%)	T4 (75%)	T5 (100%)
Yellow maize	54.30	57.90	57.47	57.07	56.63
Full fat Soya bean	11.3	12.70	13.13	13.53	13.97
Groundnut cake	10.00	10.00	10.00	10.00	10.00
Maize offal	0.00	2.50	5.00	7.50	10.00
Wheat offal	15.00	7.50	5.00	2.50	0.00
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
Salt	0.25	0.25	0.25	0.25	0.25
Premix	0.25	0.25	0.25	0.25	0.25
Methionine	0.20	0.20	0.20	0.20	0.20
Lysine	0.20	0.20	0.20	0.20	0.20
Total	100	100	100	100	100
Calculated analysis					
Crude protein	20.00	20.00	20.00	20.00	20.00
ME (kcal/kg)	2830.48	3625.81	3031.02	3046.38	3061.55
Crude fibre	3.54	3.55	3.80	3.54	3.65
Ether extract	5.51	5.76	5.77	5.79	5.82
Calcium	1.67	1.65	1.66	1.65	1.68
Phosphorus	0.58	0.55	0.56	0.55	0.54
Lysine	0.99	1.02	0.97	0.96	0.95
Methionine	0.35	0.34	0.35	0.35	0.34

A bio-organic nutrient PREMIX containing Vit A -3600,000 iu, Vit.D3 - 600000 iu, Vit.E- 400 mg, Biotin – H- 2300 mg, Vit B1-640 mg, Vit. B2- 1600 mg, Vit k3-600mg, panthothenic acid – 2000mg, folic acid -200mg, Cholin chloride -70000 mg, Cobalt – 80mg, Cupper – 1200mg, Iodine – 400mg,Iron -800mg, Manganese – 1600mg, Solenium – 80mg, Zinc – 12000mg,Anti-oxidant 120000mg was added.

Data Collection

Data were collected on growth performance (Daily feed intake, Daily weight gain and Feed conversion ratio)

RESULTS

It was observed that birds fed died 5 had better performance than the control in terms of daily feed intake, daily weight gain and feed conversion ratio at both starter and finisher phase

Table 3; Proximate Composition of Maize Offal

Parameters	Values (%)
Dry matter	10.46
Crude Protein	12.98
Ether extract	3.10
Crude fibre	8.68
Ash	3.19
Nitrogen Free Extract	72.05
Metabolizable Energy (Kcal/kg0)	3253.11

Table 4. Performance of Broiler Chickens fed Dietary Levels of Maize Offal

Parameters	DIETS					SEM
	1	2	3	4	5	
Initial weight(g)	104.00	98.00	100.00	102.94	101.96	10.27 ^{NS}
Body weight at 4 th week(g)	1116.91	1131.13	1153.55	1064.71	1119.73	3383.00 ^{NS}
Final weight (g)	2600.00	2510.00	2700.00	2880.00	2760.00	0.04 ^{NS}
Total weight gain (g)	2496.00	2412.00	2600.00	2777.06	2658.04	201.90 ^{NS}
Starters Phase (1 – 4 weeks)						
Daily feed intake (g)	57.01	56.98	58.04	56.04	55.12	5.59 ^{NS}
Daily weight gain (g)	27.19 ^b	37.50 ^a	36.66 ^a	35.86 ^a	35.57 ^a	14.08*
Feed conversion ratio	2.1-	1.52	1.59	1.56	1.55	0.11 ^{NS}
Mortality (Number)	0	0	1	0	1	-
Finisher Phase (5 – 8 weeks)						
Daily feed intake (g)	136.25	126.75	123.32	129.17	133.31	232.5 ^{NS}
Daily weight gain (g)	43.80	48.76	53.03	53.93	62.31	66.47 ^{NS}
Feed conversion Ratio	3.11	2.60	2.33	2.39	2.14	0.21 ^{NS}
Mortality (Number)	1	1	3	2	-	-
Overall Performance (1 – 8 week)						
Daily Feed intake (g)	96.63	91.87	90.69	92.61	94.22	47.45 ^{NS}
Daily weight gain (g)	35.50	43.13	44.85	44.90	48.95	201.90 ^{NS}
Feed conversion ratio	2.72 ^c	1.98 ^b	1.96 ^b	2.06 ^b	1.85 ^a	0.06*
Mortality (Number)	1	1	4	3	1	-

SEM = Standard Error of Mean, NS = Not Significant, ^{abc} means bearing different superscripts within same row are statistically (P>0.05) different

Table 5; Cost benefit of using maize offal as replacement for wheat offal

Parameters	DIETS				
	T1 (0%)	T2 (25%)	T3 (50%)	T4 (75%)	T5 (100%)
Total Feed intake (kg)	5.41	4.88	5.08	5.19	5.28
Feed Cost(₦/kg)	120.32	116.29	114.89	113.49	112.09
Total feed cost(₦)	636.00	567.50	583.64	589.01	591.84
Total weight gain (kg)	1.99	2.42	2.52	2.51	2.74
Feed cost/kg gain (₦)	319.60	234.50	231.60	234.67	216.00
Cost saving (₦)	0.00	85.10	88.00	84.93	103.60

CONCLUSION

Base on the results obtained in the experiment, the following conclusions were drawn:

The replacement of wheat offal for maize offal in broiler's diets improved feed utilization and did not in any way compromise performance, with a reduction in feed cost.

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