

EFFECT OF REPLACING WHEAT OFFAL WITH RICE BRAN ON GROWTH PERFORMANCE OF BROILER CHICKENS

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Abstract

A feeding trial was carried out to evaluate the effect of replacing wheat offal with rice bran on growth performance of broiler chickens. Five (5) diets were formulated in which rice bran replaced wheat offal at 0, 25, 50, 75 and 100% levels, designated as diets 1, 2, 3, 4 and 5 respectively. Two hundred (200) day-old broiler chicks weighing between 158.98 – 169.02 g were randomly allotted to five diets in replicates of three containing 13 birds each in a completely randomized design. Feed and water were provided *ad libitum* and the experiment lasted for eight (8) weeks. Results showed that there was no significant influence of diet on all performance parameters during the starter, finisher and overall phases. It was therefore concluded that rice bran can completely replace wheat offal in broiler chicken diets without compromising growth performance.

Keywords: Wheat offal, Rice bran, Broiler chickens, Growth performance

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Introduction

The growth of Nigerian poultry industry is constrained by persistent scarcity and high cost of conventional feed ingredients such as maize and soya bean. To stem this problem and ensure that the sector expresses its full potentials of making animal protein available at affordable rate, the need for use of relatively cheap and readily available unconventional feedstuff becomes necessary. This will also reduce feed cost which stands at about 75 - 80 % of the total cost of broiler chicken production (Ani *et al.*, 2012). Previous research findings have shown that diets formulated with some alternative fibre sources such as rice offal can replace wheat offal in broiler diets (Amaefule *et al.*, 2006). Rice offal has a CP content of 5.09% and 30.39% crude fibre. The inclusion of rice offal at up to 15% level in broiler chicken diets, did not negatively affect performance and carcass yield (Makinde *et al.*, 2014). Okpanachi *et al.*, (2015) reported that, when treated with urea, rice offal can be included in broiler diets at up to 15 and 10% levels respectively without reduction in performance. This study was therefore aimed at investigating the performance of broiler chickens fed graded levels of rice bran as replacement of wheat offal in the study area.

Materials and methods

The experiment was carried out at the Poultry Teaching and Research Farm, College of Agriculture, Bauchi, Bauchi State. Five experimental diets were formulated in which rice bran replaced wheat offal at 0, 25, 50, 75 and 100% levels, designated as diets 1, 2, 3, 4 and 5 respectively. The percentage composition and calculated analysis of experimental diets for both the starter and finisher phases are presented in Tables 1 and 2. A total of 200 day-old chicks were allotted to five experimental diets in three replicates of 13 birds each in a completely randomized design. The study lasted for 56 days. Data was collected for feed intake, weight gain, feed conversion ratio and mortality. All data collected were subjected to ANOVA. L.S.D. was used for mean separation.

Table1: Ingredients and Percent Composition of Rice Bran as Replacement for Wheat Offal Fed to Broiler Chickens at the Starter Phase (1-4 weeks)

Ingredients	Diets				
	1	2	3	4	5
Yellow sorghum	52.46	52.46	52.46	52.46	52.46
Soya bean	18.14	18.14	18.14	18.14	18.14
Groundnut cake	10.00	10.00	10.00	10.00	10.00
Fish meal	5.00	5.00	5.00	5.00	5.00
Wheat offal	10.00	7.50	5.00	2.50	0.00
Rice bran	0.00	2.50	5.00	7.50	10.00
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
Lysine	0.20	0.20	0.20	0.20	0.20
Methionine	0.20	0.20	0.20	0.20	0.20
Total	100.00	100.00	100.00	100.00	100.00
Calculated Analysis (%)					
Crude protein	23.00	22.93	22.85	22.78	22.70
ME (kcal/kg)	2780.70	2767.90	2754.20	2725.35	2789.70
Crude fibre	4.78	4.78	4.45	4.97	4.96
Ether extract	3.83	4.07	4.29	4.51	4.73
Ash	3.89	3.98	4.07	4.16	3.89
Lysine	0.89	0.89	0.88	0.87	0.86
Methionine	0.33	0.33	0.33	0.34	0.34
Calcium	1.35	1.55	1.53	1.54	1.53
Phosphorus	0.58	0.59	0.60	0.60	0.60

Table 2: Ingredients and Percent Composition of Rice Bran as Replacement for Wheat Offal Fed to Broiler Chickens at the Finisher Phase (5-8 weeks)

Ingredients	Diets				
	1	2	3	4	5
Yellow sorghum	55.40	55.40	55.40	55.40	55.40
Soya bean	13.20	13.20	13.20	13.20	13.20
Groundnut cake	10.00	10.00	10.00	10.00	10.00
Fishmeal	2.00	2.00	2.00	2.00	2.00
Wheat offal	15.00	11.25	7.50	3.75	0.00
Rice bran	0.00	3.75	7.5	11.25	15.00
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
Lysine	0.20	0.20	0.20	0.20	0.20
Methionine	0.20	0.20	0.20	0.20	0.20
Total	100.00	100.00	100.00	100.00	100.00
Calculated Analysis (%)					
Crude protein	20.00	19.89	19.78	19.67	19.55
ME(kcal/kg)	2736.10	2747.00	2765.00	2762.00	2736.10
Crude fibre	4.20	3.52	4.84	4.52	4.20
Ether extract	3.65	3.99	4.33	4.65	3.63
Ash	348	3.42	3.75	3.89	4.02
Lysine	1.33	1.32	1.31	1.30	1.29
Methionine	0.25	0.26	0.44	0.26	0.26
Calcium	1.45	1.45	1.46	1.45	1.44
Phosphorus	0.67	0.67	0.66	0.66	0.64

Results and discussion

Results for growth performance of broiler chickens (Table 3) revealed that no parameter was significantly influenced by diet during study phases. During the starter phase, birds at 4th week weighed between 606.32g on diet 5 and 714.10g on diet 3, daily feed intake, 43.29g (diet 3) to 50.44g (diet 1), daily weight gain, 15.89g (diet 5) to 20.10g (diet 2) while feed conversion ranged from 2.22 (diet 3) to 2.73 (diet 1). This agrees with Onuh *et al.* (2015), Similar performance was recorded during the finisher phase. Final weight of birds ranged from 1322.70g (diet 3) to 1564.70g (diet 2), daily feed intake, 91.69g (diet 3) to 101.10g (diet 1), daily weight gain, 31.74g (diet 3) to 42.33g (diet 2) and feed conversion ratio from 2.29 to 2.89 on diets 2 and 3 respectively. This contradicts Akpet and Ibekwe (2018). The overall phase showed that total feed intake of birds ranged from 3779.64 to 4243.12g, total weight gain, 1400.08 – 1747.96g, daily feed intake, 67.49 – 75.77g, daily weight gain, 25.00 – 31.21g and feed conversion ratio from 2.27 to 2.83.

Table 4: Performance of Broiler Chickens Fed Varying Levels of Rice Bran (1-8 weeks)

	Diets					
Parameters	1	2	3	4	5	SEM
Starter phase (1-4 weeks)						
Initial Weight(g)	169.02	158.98	161.54	163.46	161.19	6.26 ^{NS}
Week 4 weight	695.98	721.70	712.10	648.98	606.19	39.21 ^{NS}
Daily Feed intake (g)	50.44	43.88	43.30	44.45	45.03	1.58 ^{NS}
Daily weight gain (g)	18.82	20.10	19.66	17.34	15.89	0.26 ^{NS}
Feed Conversion ratio	2.73	2.25	2.22	2.57	2.84	0.33 ^{NS}
Mortality (%)	1	0	0	1	1	-
Finisher phase (5-8 weeks)						
Final Weight (g)	1495.5	1564.7	1383.1	1353.3	1322.7	100.23 ^{NS}
Daily Feed Intake (g)	101.1	97.09	91.69	93.25	95.87	5.63 ^{NS}
Daily Weigh Gain (g)	38.05	42.33	31.74	33.52	34.11	3.42 ^{NS}
Feed Conversion Ratio	2.58	2.29	2.89	2.84	2.82	0.25 ^{NS}
Mortality (%)	1	1	1	1	1	-
Overall phase (1-8weeks)						
Total feed intake (g)	4243.12	3947.16	3779.64	3855.60	3945.28	160.49 ^{NS}
Total weight gain (g)	1592.36	1747.96	1439.28	1424.08	1400.08	121.38 ^{NS}
Final Weight (g)	1761.38	1906.94	1600.82	1587.54	1561.27	119.20 ^{NS}
Daily Feed Intake (g)	75.77	70.49	67.49	68.85	70.45	3.65 ^{NS}
Daily Weigh Gain (g)	28.44	31.21	25.70	25.43	25.00	2.47 ^{NS}
Feed Conversion Ratio	2.66	2.27	2.56	2.70	2.83	0.23 ^{NS}
Mortality (%)	2	1	1	2	2	-

SEM = Standard error of the mean, NS = Not significant

Conclusion

Rice bran can completely (100%) replace wheat offal in broiler chicken diets without compromising growth performance.

References

- Akpet, S. O. And Ibekwe, H. A. (2018). Performance, haematological and serum characteristics of broiler chicks fed diets with graded levels of rice offal. *International Journal of Food Science and Nutrition*, **3** (6): 61 – 67.
- Amaefule, K. U., Iheukwumere, F. C., Lawal, A. S. and Ezekwonna, A. A. (2006). The effect of treated rice milling waste on performance, nutrient retention, carcass and organ characteristics of finisher broilers. *International Journal of Poultry Science*, **5**(1):50-55
- Ani, A. O., Oguwuowo, L. C., Omeje, O. D. (2012). Growth performance of broiler chicks fed diets containing raw bambara nut (*Vigna subterranean* L.) waste and supplementary enzymes. *African Journal of Biotechnology*, **11** (56): 11991 – 11997.
- Makinde, O. J., Enyigwe, P. C., Babajide, S. E., Atsumbe, J. A., Ibe, E. A. and Samuel, I. (2014). Growth performance and carcass characteristics of finisher broilers fed rice offal based diets supplemented with exogenous enzymes. *Greener Journal of Agricultural Sciences*, **4** (4): 144 - 149.
- Okpanachi, U., Boyi, P. U., Egbu, C. F. and Oyibo, A. (2015). Performance and internal organ characteristics of broiler chickens fed urea-treated and untreated rice milling waste. *International Journal of Animal Biology*, **1** (4): 130 – 135.