UTILIZATION OF RICE OFFAL IN PRACTICAL RATIONS FOR BROILER CHICKS

I.I. DAFWANG[1] AND E.B.N. SHWARMEN

[1]*Plateau State College of Agriculture, P.M.B. 33, Lafia. Plateau State,*

Received 27 September, 1994; Accepted 29 November, 1995

ABSTRACT

Rice offal, a by-product of rice processing, was fed at graded levels of 0,5,10,15 and 20% to 1800 broiler chicks from 3-6 weeks old in two experiments. In experiment 1, Weight gains were significantly depressed by the rice offal-containing diets except for one ration with 10% rice offal which gave growth performance comparable to those obtained with the control diet. In the second experiment, however, growth performance on rations containing 0,5 and 10% rice offal were similar for all parameters measured. It was concluded that rice offal can be fed successfully to broiler chicks at dietary levels of up to 10% without adverse effect on growth performance.

Key Words: Rice offal, Broiler Feeds, Poultry.

INTRODUTION

Rice offal is the by-product obtained from small-scale rice mills that process parboiled rice through a mechanism which combines husk removal and polishing into one operation to produce only two products the clean grain ready for eating and the offal which contains husk, bran, polishings and small quantities of broken grain. It has been estimated that these small-scale rice mills process over 80% of the rice produced in Nigeria. Since rice offal makes up 40% of parboiled rice, Nigeria has the potential to produce about 200.000 metric tonnes of rice offal from the 500.000 metric tonnes of rice produced annually in Nigeria (Wudiri, 1991).

Inspite of its abundance, rice offal has been neglected by animal nutritionists because it contains a high level of fibre and is low in protein and energy. Information available on the nutritional value of rice offal include that of Obeka (1985) who gave the composition and also studied the replacement value of rice offal for maize in pullet and layers rations and reported that rice offal can be used at levels of up to 41.7% in pullet rations and 25% in layers' rations. Oyeyiola (1991) also recommended a 40% inclusion rate for pullets and 20% for layers.

The study reported here was motivated by the fact that Lafia town has over 100 of these small scale rice mills which produce large quantities of rice offal all year round and is usually discarded as a waste product. Most often it is burnt off to reduce pollution. The purpose of the study was to determine the feeding value of rice offal in broiler chick rations.

MATERIALS AND METHODS

Rice offal was collected fresh from a near-by rice mill for this study. The feedstuff was sampled and taken to the National Veterinary Research Institute Vom, for proximate chemical analysis. The broiler chicks used in this study were of Anak breed purchased commercially from a local hatchery at day old and reared to three weeks old in accordance with the standard management procedures in the College Poultry Research Farm.

At threee weeks of age, the chikcs were randomly allocated to six isonitrogenous rations containing rice offal at 0,5,10,15 or 20%. The 10% rice offal ration was formulated twice to give the sixth ration which was the least cost ration under the prevailing conditions then. The composition of the rations are given in Table 1. A total of 1200 chicks were allocated in four lots of 50 birds per treatment to the six dietary treatments in experiment 1 while 600 chicks were allocated to three rations contianing 0,5,or 10% rice offal (Rations 1,2,3 in Table 1), also in four lots of 50 birds per dietary treatment in

[2]Present Address: N.A.E.R.L.S., A.B.U. Zaria.

experiment 2

The chicks were reared in tropical open-sided poultry pens on deep litter with a floor space allowance of 0.074m^2/bird. Feed and water were given *ad-lib*. Mortality records were kept daily. Weighing of birds and feed was done weekly. The three weeks' cumulative weight gain, feed consumption and feed efficiency were computed and subjected to analysis of variance. Significance of differences between means was assessed by the Duncans' Multiple Range Test (Steel and Torrie, 1960).

RESULTS AND DISCUSSION

The proximate chemical composition of rice offal is shown on Table 2. Except for the dry matter, the values are very similar to those of Obeka (1985) and Oyeyiola (1991) as shown in Table 2. Compared to rice bran which has been more widely studied, rice offal has a poorer chemical profile but it is richer than rice husk which is the other major by-product of rice processing mills (NRC 1984).

In experiment 1, the addition of rice offal depressed growth at all levels except for the least cost ration which also contianed 10% rice offal. Weight gain was 666g/bird on the control diet compared to gains of 549.5g to 626.3g at 5, 10, 15, 20 and 10% rice offal inlusion rates in the rations respectively (Table3). Growth performance on the control diet was similar to that of the least cost ration for all the parameters measured. Although the 5% rice offal diet had siginificantly higher feed cost per kg of weight gain, rations containing 10 and 15% rice offal had numerically lower feed cost/kg gain than that of the control diet. The poorer performance of birds on the 5% rice offal diet in weight gain and feed cost/kg gain which were only similar to these obtained on the 20% rice offal diet may be alluded to chance. In experiment 2 however, body weight gain, feed coversion ratio and feed cost/kg gain were similar for rations containing 0,5, and 10% rice offal. In contrast to experiment 1,

TABLE 1. PERCENTAGE COMPOSITION OF EXPERIMENTAL RATIONS

Ingredient	1	2	3	4	5	6
Maize	60.0	54.5	49.0	43.5	38.00	38.9
Soyabean	30.0	30.5	31.0	31.5	32.00	22.50
Blood meal	6.4	6.4	6.4	6.4	6.40	10.0
Maize Offal	-	-	-	-	-	15.0
Rice Offal	-	5.0	10.0	15.0	20.00	10.00
Bonemeal	2.0	2.0	2.0	2.0	2.0	2.0
Oyster shell	1.0	1.0	1.0	1.0	1.0	1.0
Salt	0.25	0.25	0.25	0.25	0.25	0.25
Methioqine	0.10	0.10	0.10	0.10	0.10	0.10
Premix [1]	0.25	0.25	0.25	0.25	0.25	0.25
Caculated Analysis						
Protein %	22.0	22.0	22.0	22.0	22.0	22.0
M.E. Kcal/kg	3289	3186	3038	2980	2934	2879
Crude Fibre%	3.5	5.67	7.16	8.99	12.60	6.43
Lysine%	1.70	1.71	1.67	1.74	1.75	1.77
Methionine%	0.63	0.63	0.67	0.62	0.58	0.60
Calcium%	1.15	1.02	1.02	1.02	1.04	1.04
Phosphorus %	0.78	0.70	0.61	0.70	0.71	0.68
Cost N/kg	2.37	2.34	2.31	2.26	2.21	2.01

[1] Zoodry; a Pfizer product supplying the following per kg of diet; 800 I.U. Vit. A; 1200 I.U. Vit. D3; 13mg Vit. E; 2mg Vit. k3; 3mg Riboflavin, 0.06mg Ciobolamin. 1.5mg Folic acid, 0.25mg Biotin; 125mg Santoquin; 25mg Fe; 80mg; Mn; 50mg Zn; 2mg Cu; 0.2mg Co and 0.1mg Se.

TABLE 2 PROXIMATE CHEMICAL COMPOSITION OF RICE OFFAL (% AS FED)

	Lafia (1991)	Obeka (1985)	Oyeyiola (1991)	Mean
Dry matter	89.43	97.34	91.00	92.58
Crude Protein	6.13	6.20	5.71	6.01
Ether Extract	-	5.52	5.01	5.27
Nitrogen Free Extract	24.91	30.54	23.38	26.28
Crude Fibre	38.23	37.60	44.94	40.06
Ash.	20.10	20.20	20.97	20.42
Metabolisable Energy (Kcals/Kg)	-	1319.6	1184	1251.8

TABLE 3. EFFECT OF DIETARY RICE OFFAL ON GROWTH PERFORMANCE OF BROILER CHICKS (3-6 WEEKS).[1]

%Rice offal	Body Wt (g)	Wt Gain (g)	Feed Intake (g)	Feed/ Gain	Feed Cost per kg gain (₦)
			Experiment 1		
0	993.4a	666.0a	1888a	2.85	6.76b
2	912.3c	566.8c	1840ab	3.24	7.57a
10	921.0bc	583.bc	1670b	2.87	6.63b
15	925.6bc	578.3bc	1786ab	3.09	6.68b
20	891.5c	549.5c	1800ab	3.28	6.93ab
10	964.6ab	626.3ab	1966a	3.15	6.31b
SEM	10.1	10.8	30.5	0.13	0.13
			Experiment 2		
0	1146	742.9	2365	3.19	8.10
5	1241	837.6	2666	3.20	7.10
10	1191	790.3	2600	3.29	7.97
SEM	25.1	24.5	61.3	0.04	0.10

[1] Within the same column means with different superscripts are significantly different ($P < 0.05$).

birds on the 5% rice offal diet had numerically better gwroth performance than the control diet (87.6g vs 742. 9g).

The results of this study show that rice offal can be fed at dietary levels of up to 10% to broiler chicks without adverse effect on growth. This level is much lower than the 25% inclusion rate recommended by Ogundipe (1991) for pullets from 0- 8 weeks and Obeka (1985) and Oyeyiola (1991) who recommend up to 40% inclusion rate for growing pullets from 9-20 weeks. The lower tolerance level for broiler chicks may not be unconnected with their higher nutrient requirement compared to pullets. This may also account for the fact that even on the international scene, reports of studies on the utilization of high fibre containing plant by-products by broiler chikcs are very scanty. Deolanker and Singh (1979) are amongst few workers that fed diets in which rice bran replaced maize at levels of 50,75, or 100% from 10-49 days and reported that diets in which rice bran replaced 75 or 100% had adverse effect on growth performance. Further research is needed to establish the optimum utilization rates for rice offal by broilers in view of its relative abundance.

The finding that rice offal can be utilized at levels of up to 10% in broiler starter rations is very useful. At this level, the rice offal replaced 27.5% of maize in the control diet (Table 1). Given the need to source for alternative ingredients to coventional ones like maize which are more needed for human feeding, the significance of these results become obvious. Furthermore the finding that rice offal can be incorporated at levels of up to 40% for pullets (Obeka, 1985 and Oyeyiola 1991) and 25% for layers (Obeka, 1985) shows that rice offal has high potential for use in all poultry rations with possible savings on feed cost and maize or grain utilization.

ACKNOWLEDGEMENT

The authors wish to express appreciation to all the staff of the College's poultry research laboratory and three students who assisted in the conduct of the study: Messrs R.D. Ayenajeh, M.J. Macham and R.J. Nanle. The study was funded by the College. The authors are most grateful to the College management for their support.

REFERENCES

DEOLANKER, R.P. and SINGH, K.S. (1979). Trypsin - Inhibitor, mineral availability and performance of broiler chickens fed on deits based on rice bran. Animal feed Science and Technology. 4:133-141.

NATIONAL RESEARCH COUNCIL (1984). Nutrient Requirements of Domestic Animals. 8th Revised Edition. National Academic Press, Washington D.C.

OBEKA, E.A. (1985). Nutritive evaluation of rice offal in the diets of growing pullets and layers. Unpublished M.Sc. Thesis. Department of Animal Science, Ahmadu Bello University, Zaria.

OYEYIOLA, L.B.E. (1991). Utilization of rice offal by egg type chickens. M.Sc. Thesis. Department of Animal Science, Ahmadu Bello University, Zaria.

STEEL, R.G.D. AND TORRIE, J.D. (1960). Principles and Procedures of Statistics. McGraw-Hill Book Co. New York.

WUDIRI, B.B. (1991) Production of cereal crops in Nigeria: from research to farmers' fields. Seminar paper delivered to staff and students, Plateau State College of Agriculture, Lafia, 1991.