GRADED REPLACEMENT OF FISH MEAL WITH RICE PROTEIN MEAL IN BROILER RATION

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In the six week trial, 150 day-old broiler chicks were fed on five experimental rations. The ration were formulated in such a way that fish meal was gradually replaced with rice protein meal. Average total weight gain per chick and feed consumption per chick on rations A, B, C, D and E was 1561.90, 1606.43, 1518.10, 1505.30 and 2523.95 g and 3152.40, 3156.30, 3137.00, 3092.60 and 2523.95 g, respectively. Average feed efficiency and dressing percentage of chicks on rations A, B, C, D and E was 2.02, 1.96, 2.07, 2.06 and 1.85 and 62.18, 62.30, 58.30, 60.50 and 58.50, respectively. Significant differences were found among the treatments in everting influenee on weight gain and feed consumption but non-significant differences were found among the treatments in everting influence on feed efficiency and dressing percentage. It was observed that ration containing 10% rice protein meal was most economical.

INTRODUCTION

Poultry industry has played a vital role in providing food for the rapidly growing population in Pakistan. For the last few years broiler production has become the focus of attention for Pakistani research workers. Feed cost of poultry production usually ranges between 65-75% of the total cost of production (Mohy-ud-Din and Walha, 1984). Protein is considered to be the second major nutrient after energy in the formulation of poultry ration. This is mainly supplied by vegetable and animal protein supplements. Animal protein supplements are costly but these contain essential amino acids which have more bioavailability and are in better proportion to support chick growth. Fish meal available in the market is generally of poor quality due to improper processing and adulteration. Rice protein meal has more crude protein (47.34%) and {jetabolizablc energy as compared to fish meal. Thus research was conducted to study the effect of substitution of fish meal with rice protein meal in broiler ration.

MATERIALS AND METHODS

One hundred and fifty day-old chicks were raised for a period of six weeks at Animal Nutrition Research Centre, University of Agriculture, Faisalabad to study the effect of substitution of fish meal with rice protein meal. The chicks were randomly divided into 15 replicates of 10 chicks each. Five isonitrogenous and isocaloric rations were prepared and designated as A, B, C, D and E (table I & 2). Each experimental ration was allotted to three experimental units at random. Room temperature was maintained at 35°C at the start of the experiment. The temperature was lowered by 3°C each week till the end of 4th week, after which the temperature was maintained at about 25°C. Water and light was made available round the clock. The data was recorded on weight gain, feed consumption, feed efficiency and dressing percentage. The data was subjected to statistical analysis using analysis of variance technique (Steel and Torrie, 1981).

Table 1, Percent composition of broiler starter rations

Description	Rations				
	A	B	C	D	E
Maize	35.25	34.85	34.20	33.80	33.40
Wheat	18.50	18.50	18.50	18.50	18.50
"(f'heat bran	2	2	2	2	2
Cotton seed meal	5	5	5	5	5
Soybean oil meal	5.5	5.5	5.5	5.5	5.5
Corn gluten 30%	6	6	6	6	6
Corn gluten 60%	4	4	4	4	4
Guar meal	3	3	3	3	3
Sunflower oil meal	1.5	1.5	1.5	1.5	1.5
Poultry bi-product meal	3	3	3	3	3
Fish meal	10	7.5	5	2.5	0
Rice protein meal	0	2.5	5	7.5	la
Molasses	3	3	3	3	3
Soybean oil	2	2	2	2	2
Di-calcium phosphate	0	0.4	0.8	1.2	1.6
Limestone	I	I	I	I	I
Pre mix	0.25	0.50	0.50	0.50	0.50

Table 2. Percent composition of broiler finisher rations

Description	A	B	C	D	E
Maize	39.75	39.75	39.75	39.75	39.75
Wheat	21.50	21.50	21.50	21.50	21.50
Wheat bran	1.55	1.25	0.95	0.55	0.15
Cotton seed meal	3	3	3	3	3
Soybean oil meal	3	3	3	3	3
Corn gluten 30%	6.5	6.5	6.5	6.5	6.5
Corn gluten 60%	2.5	2.5	2.5	2.5	2.5
Guar meal	2.5	2.5	2.5	2.5	2.5
Poultry bi-nroduct meal	3	3	3	3	3
Fish meal	la	7.5	5	2.5	0
Rice protein meal	0	2.5	5	7.5	10
Molasses	2.5	2.5	2.5	2.5	2.5
Soybean oil	2.5	2.4	2.3	2.2	2.1
Di-calcium phosphate	0.7	1.10	1.50	2.0	2.5
Limestone	0.5	0.5	0.5	0.5	0.5
Pre mix	0.5	0.5	0.5	0.5	0.5

RESULTS AND DISCUSSION

A. Weight gain: The average weight gain per chick fed on rations A, B, C, D and E were 1561,9,1606.4,1518.1,1505.3 and 1361.16 g, respectively. The highest weight gain (1606.4 g) was obtained with chicks feed on ration B while lowest weight gain (1361.16 g) was obtained with chicks fed on ration E. The analysis of variance revealed significant differences in weight gains amongst the chicks fed on different experimental ration (Table 3). The results of the study indicated that inclusion of rice protein meal in broiler ration at the rate of 2.5% showed excellent weight gain. However, weight gain was depressed when rice protein meal was increased upto 10%. The results are in accordance with Baia *et al.(1982)* who proved that nutritional values of soybcan oil meal when supplemented with amino acid and fish meal were not significantly different. The results also agreed with Sterk *et al.* (1979) who noted that substitution of fish meal with vegetable protein meal supplemented with methionine did not exert any adverse effect on the performance of birds.

B. Feed Consumption: Feed consumption of chicks fed on rations A, B, C, D and E were 3152.4, 3156~3, 3137.0, 3092.6 and 2523.9g, respectively. Apparently the maximum feed (3156.4 g) was consumed on ration Band minimum feed (2523.9 g) was consumed on ration E. The analysis of variance revealed significant differences in feed consumption of chick fed on different rations (Table 3). The findings were in accordance with Sentek (1975) who used different proportions of fish meal and toasted soybean oil meal in laying ration and found no significant effect intake. The rice protein meal is in powdered form and if it is used in low level with fish i.e. 2.5, 5 and 7.5%, then texture of the ration is acceptable to birds and intake of feed would be satisfactory.

C. **Feed Efficiency:** Average feed efficiency values of chicks fed on experimental rations. A, B, C, D and E were 2.02, 1.96, 2.07, 2.06 and 1.85, respectively. The analysis of variance revealed non-significant differences among the feed efficiency values. Feed efficiency of ration E was better but weight gain on ration E was comparatively less than other rations. It was because of the texture of feed which reduced intake of feed. The results agreed with Halga *et al.(1978),* Vavak *et al.(1980)* who observed that inclusion of vegetable protein source as substitute of fish meal had no adverse effect..

D. Dressing Percentage: The average values of dressing percentage were 62.18, 62.30, 58.30, 60.50 and 58.50 on rations A, B, C, D and E, respectively which were statistically non-significant (Table 3). The results showed that various levels of rice protein meal did not influence the dressing percentage. The results agreed with Curto and Cicogna (1968) who substituted fish meal with soy bean oil meal and

Table 3. Analysis of variance of the data on weight gain, feed consumption, feed efficiency and dressing percentage.

S.O.V	dJ.	F. Values			
		Weight gain	Feed consumption	Feed Efficiency	Dressing percentage
Rations	4	5.695*	133.59**	2.529^{NS}	2.055^{NS}
Error	10				

* Significant ** Highly Significant NS Non-significant.

fund non-significant effect on carcass yield of birds.

E. Economics: The cost of one kilogram of rations A, B, C, D and E was Rs. 5,,40, 5.39, 5.38, 5.36 and 5.35 and cost of feed per chick amounted to Rs. 17.02, 17.04, 16.90, 21.36 and 13.60, respectively. The net profit amounted to Rs. 15.78,12.86,16.16,11.51 and 17.80 in case of rations A, B, C, D and E, respectively. It revealed that ration containing 10% rice meal protein was the most economical.

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