

The effect of replacing corn with rice bran on the growth and performance of broiler chickens.

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Introduction

In 2002, Malaysia imported about 2.0 billion worth of feedstuffs from many countries. Corn, soyabean, fishmeal and many other feed ingredients are imported from other countries. Rice bran is a by-product of the rice milling industry is also an energy source and can be used as a feed ingredient. However, the use of rice bran in poultry feed is limited by an anti-nutritional factor known as phytic acid, which combines with phosphorus to make it unavailable. In most poultry rations, corn is the main energy source and if rice bran can replace corn, a considerable amount of foreign exchange can be saved by the country. This study examines the effect of partial replacement of corn with rice bran on the growth performance and digestibility of nutrients in broiler chickens.

Materials and Methods

An experiment was conducted to examine the effect of varying levels of rice bran on the growth performance and digestibility of nutrients in broiler chickens. In a completely randomised design (CRD) experiment 1200 21-day old straight-run Arbor Acre broiler chicks were divided into groups of 75 and fed iso-caloric and iso-nitrogenous diets containing 0 (Diet 1), 15 (Diet 2), 25 (Diet 3) and 35 % (Diet 4) rice bran (RB) until they were 42 days of age. Prior to the trial, from day-old to 21 days of age, the birds were fed a commercial broiler starter ration containing 12.6 MJ Metabolisable Energy (ME) /kg and 22% crude protein (CP). The live weight, feed intake and feed conversion ratio, were measured commencing day 21 and thereafter on a weekly basis. At the end of the trial, 6 broiler chickens were selected randomly from each treatment and slaughtered to determine carcass yield. A further 6 male birds were selected from each treatment and placed in individual cages to determine the *in vivo* digestibility of the diets and nutrients. Dry matter intake and total faecal output were measured over a six day period. Feed and faecal samples were subjected to proximate analyses.

Results and Discussion

The results of experiment showed that the live weights of the birds fed high levels of RB (35%) was depressed significantly beginning from 21-27 days. It was noted that, feed consumption was significantly lower in birds fed 35% RB compared to the control diet and Diet 2. The results confirmed that inclusion of RB up to 25% in broiler finisher diet had no adverse effect on the body weight and feed consumption, but there was a significant reduction in body weight of birds fed rice bran at 35 % level. The final body weights and total weight gains of birds in Diet 4 were lower than those on the other diets. Although the total feed consumption was not influenced significantly by different levels of RB inclusion, the feed intake tended to be higher at higher levels of inclusion. From 21-28 days of age the FCR of the birds fed Diet 1 was significantly lower ($p < 0.05$) than those fed Diet 4. No significant difference was observed from 28-34 or 35-41 days of age. Similarly there was no difference in the overall FCR values of the birds (21-41 days) regardless of dietary treatments. The dietary inclusion of higher level of RB (35%) had no ($p > 0.05$) effect on liver, heart, abdominal fat and carcass yield. In contrary, the gizzard weight was significantly higher ($p < 0.05$) for the birds fed 35% of RB but no difference ($p > 0.05$) was observed among the birds fed 0, 15, and 25 % RB in the diet.

The digestibility coefficients of CP, CF and EE was 67.5, 67.9, 67.1 and 65.3%; 25.1, 25.7, 22.7 and 22.4 %; and 85.5, 85.4, 85.3 and 82.3 % respectively, for Diets 1, Diet 2, Diet 3 and Diet 4. No significant difference was observed in the digestibility of different nutrients due to the dietary treatments. However, there was significant reduction in the digestibility of CP and CF when birds were fed Diets 4 as compared to Diet 1. The apparent metabolisable energy (AME) of the diets were 3214, 3168, 3132 and 3067 kcal/kg respectively for 0, 15, 25 and 35% of RB in the diet.

Conclusions

In conclusion, the results of this study showed that the birds fed Diet 2 (15% RB) attained higher body weight as compared to those on the other diets. The feed conversion ratio (FCR) was poorer for birds fed Diet 4 (35% RB) than those on the other diets. No significant difference was noted in the FCR among birds fed diets containing less than 35% RB. There were no differences in the weights of the carcass, abdominal fat, liver and heart, among the dietary treatments, but the gizzard weight was significantly higher in birds on Diet 4. No difference was noted in the digestibility of crude protein, crude fibre and ether extract. The apparent metabolizable energy contents of the diets tended to decrease with increasing levels of RB in the diet. It is suggested that rice bran can be included at levels higher than the 10% recommended by previous workers. In this study, rice

bran can be included at levels up to 25 % without obvious depression in body weight gains of feed efficiency. However, at levels higher than 35 % there were significant decrease in feed efficiency and a reduced final live weight.

Benefits from the study

This showed that if poultry rations are formulated carefully, and palm oil is used to provide part of the energy then rice bran can be included at levels higher than 25 %. Earlier studies showed that rice bran can be included at 15% for optimum growth and performance. Increasing use of rice bran can reduce import of corn, hence a saving in foreign exchange.

Patent(s), if applicable:

Nil

Stage of Commercialization, if applicable:

Nil

Project Publications in Refereed Journals:

Nil

Project Publications in Conference Proceedings

Alimon, AR., M.A. Ukil, Y. Yusnita and M. Hair Bejo (1998) The effect of replacing corn with palm kernel cake and rice bran on the performance of broilers. The 10th Veterinary Association Malaysia Scientific Congress 4-6 Sept. 1998 Shah Alam: 42-44

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Graduate Research

Name of Graduate	Research Topic	Field of Expertise	Degree Awarded	Graduation Year
M. A Ukil	The effect of phytate phosphorus in rice bran on the growth and performance of broiler chickens.	Poultry Nutrition	Ph.D.	2000

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