

ABSTRACT

Rice bran is a major cereal by-product available for animal feeding in many parts of the world. It has good balance of protein, fat, carbohydrates, fiber, vitamins and minerals. The greatest restriction to use rice bran is its highly unstable state during storage leading to rancidity, and presence of heat labile antinutritional factors. Rice bran was treated to stabilize by extrusion cooking, roasting, pelleting and with addition of antioxidant (125, 250 and 375 ppm). The rice bran so treated was stored for one year and analyzed fortnightly for free fatty acid, peroxide and Iodine value. Heat treatment was effective in stabilizing the rice bran by reducing the rancidity, and increased the storage life. Extrusion cooking proved to be the most effective process in stabilizing rice bran and roasting could be the next choice. Raw and pelleted rice bran behaved similarly with regards to stability during storage for one year. There were no significant differences in FFA, peroxide and Iodine values of rice bran treated by different levels (125, 250 and 375 ppm) of antioxidant and stored for various periods.

Rice bran processed by extrusion cooking, roasting, pelleting and treated with antioxidant (125 and 250 ppm) was used in broiler starter and finisher rations at various levels (10, 20, 30, 40 and 50 percent) replacing maize, for six weeks. Better performance of broiler chicks was observed with extrusion cooking followed by roasting, while non-significant differences were observed between raw and pelleted bran. Increasing levels of rice bran in broiler ration resulted in negative effects on growth performances ($P < 0.05$). Non-significant differences were observed in mortality and dressing percentage due to different processes and various levels of rice bran in ration. Organ weights were

higher ($P < 0.05$) in raw and pelleted rice bran as compared to extruded and roasted bran. Liver and heart weights were increased ($P < 0.05$) with increasing levels of rice bran above twenty percent in ration while pancreas weight was increased with addition of rice bran at each level. Rice bran can be used upto 20 percent in ration without any adverse effect on broiler chicks mortality and organ weights. Increasing levels of rice bran above 20 percent in broiler ration has negative effects on broiler performance with increase in mortality and organ weights. Non-significant differences were observed in broiler performances when fed rations with raw and pelleted rice bran. Chicks fed rations with extrusion cooked rice bran resulted in significantly better growth performance than other treatments. Extruded rice bran can be used upto 30 percent in ration without any significant effect on performance, mortality and organs weight of chicks. Chicks fed rations with rice bran treated with antioxidant upto 250 ppm had non-significant effect on broiler performance.

Raw, extruded and roasted rice bran was treated with 125 and 250 ppm of antioxidant and stored for period of one year. Significant decreases in feed consumption, weight gain and feed conversion efficiency were observed when rice bran was given after storage for 4, 8 and 12 months. Better performance was observed when extruded and roasted rice bran stored for four months was given to chicks instead of raw bran, while extruded rice bran gave significantly better performance even after storage for 8 and 12 months. No difference was observed between raw and roasted rice bran stored for four months. Increasing dietary levels of stored rice bran negatively affected the performance of broiler chicks. No difference in performance was observed except for decreases in liver and heart weight when rice bran stored after addition of antioxidant

was given to broiler chicks. Increases in mortality, liver and heart weight were observed when rice bran was given to broilers after storage for 4, 8 and 12 months. Pancreas weight was increased after storage of rice bran for four months but there was no difference after storage for 8 and 12 months. Mortality, liver and heart weights of broilers were less with extruded rice bran than with raw and roasted bran. Pancreas weight of chicks was higher with raw rice bran than with extruded and roasted bran. Increasing levels of stored rice bran in chick diets increased mortality and organ weight.

Nutrient digestibility of broiler feeds containing different levels of variously processed rice bran stored for different periods was determined. Chicks of five weeks age were fed feeds containing raw, roasted and extruded rice bran treated with antioxidant, Bianox Dry[®] (125, 250 g/ton), stored for a periods of 4, 8 and 12 mo and used at levels of 10, 20 and 30 percent in feeds. Digestibility coefficients for fat and fiber of feeds were determined. Increasing storage periods of rice bran significantly reduced the fat digestibility of feed while no difference in fiber digestibility was observed. Processing of rice bran by extrusion cooking significantly increased fat digestibility, even used at higher levels in broiler feeds. Extruded rice bran stored for a year and used upto 30 percent in feed resulted in significantly higher fat digestibility in feeds as compared to feeds contained roasted or raw bran. Interaction of storage, processing and levels was significant for fat digestibility. Treatments of rice bran by different levels of antioxidant had no effect on digestibility of fat and fiber when incorporated in broiler feed.