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Nutrient Composition Analysis of Rice Bran Meal Fermented with *Rhizopus oligosporus* and *Saccharomyces cerevisae*

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Structured Abstract

Background: In rice bran, the presence of anti-nutritional factors poses challenges for poultry animals in obtaining optimal nutrients. These factors disrupt animal digestion by changing the consistency of substances in the digestive tract, reducing the effectiveness of digestive enzymes, and lowering feed efficiency. Compounds like phytate, trypsin inhibitors, and tannins in rice bran further hinder nutrient absorption, inhibit protein digestion, and decrease cellulose activity, leading to indigestion in animals. This study explores the potential of solid-state fermentation with *Rhizopus oligosporus* and *Saccharomyces cerevisae* in improving feed quality. The study aims to determine the optimal fermentation duration of rice bran meal and compare the effects of *Rhizopus oligosporus* and *Saccharomyces cerevisae* on the nutritional value of fermented rice bran meal.

Methods: A single inoculation of these microorganisms is utilised in solid-state fermentation for 3, 5, and 7 days, with non-fermented rice bran served as a control. The analysis of sample includes evaluating crude protein, crude fibre, and crude fat using proximate analysis, while the measurement of total tannin content is conducted utilizing a UV/Vis spectrophotometer.

Results: Key findings show a significant increase in crude protein in rice bran fermented with *Saccharomyces cerevisae*, surpassing *Rhizopus oligosporus* by 11.27%. Additionally, *Rhizopus oligosporus* leads to a greater reduction in crude fiber content by 2.51%. Total tannin content in rice bran fermented with *Saccharomyces cerevisae* decreases from 0.59 to 0.43 mg/ml. These results highlight the impact of both yeast and fungi fermentation on improving the nutritional composition of rice bran, enhancing both nutritional and anti-nutritional aspects.

Conclusion: In conclusion, the study reveals that both yeast and fungi fermentation significantly influence protein, fibre, fat and tannin content. Fermentation duration also plays a crucial role, impacting the extent of these changes. Further research is recommended to explore potential synergies by using multiple microbial strains in rice bran fermentation and conducting animal feeding trials with fermented rice bran meal.

Keywords: Solid-state Fermentation, Rice Bran, Nutrient Composition, *Rhizopus oligosporus, Saccharomyces cerevisae,*

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