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**NUTRITIONAL IMPROVEMENT OF RICE BRAN MEAL VIA FERMENTATION  
BY *Bacillus subtilis* AND *Rhizopus oligosporus***Nur Zahirah Zamri<sup>a</sup>, Farizan Aris<sup>a\*</sup>**Structured Abstract**

**Background:** Rice bran a common by-product in rice-producing nations, has been employed as an alternative poultry feed source due to rising costs of conventional feed raw materials. Its widespread use in poultry nutrition is attributed to its substantial nutrient content, encompassing significant levels of fat, protein, amino acids, metabolizable energy, and serving as a rich source of B-group vitamins. However, the elevated fiber content in rice bran has posed limitations on poultry nutrient intake. The purpose of this study is to compare the nutritional composition of rice bran by single-culture fermentation with *B. subtilis* and *R. oligosporus*.

**Methods:** The process of fermenting rice bran involved combining rice bran with a concentration of  $1.0 \times 10^8$  cells/mL of *B. subtilis* and  $1.0 \times 10^6$  spores/mL of *R. oligosporus*. Fermentation durations included 0, 2, 3, and 5 days for *B. subtilis* and 0, 3, 5, and 7 days for *R. oligosporus*. Post-fermentation, the crude protein, crude fiber, crude fat, and antinutritional factors (tannin) of rice bran were assessed using the kjeldahl method, soxhlet method, and the vanillin-hydrochloric method, respectively.

**Results:** The main outcomes of the study indicate a reduction in crude fiber, crude fat, and anti-nutritional (tannin) content. Specifically, for *B. subtilis*, there was a decrease of 7.69% in crude fiber, 4.86% in crude fat, and 5.03 mg TAE/g in tannin content. In the case of *R. oligosporus*, the reductions were 9.41% in crude fiber, 6.06% in crude fat, and 5.99 mg TAE/g in tannin content. Conversely, there is a notable increase in crude protein content by 20.08% for *B. subtilis* and 19.38% for *R. oligosporus* in the fermented rice bran. These results suggest that the introduction of *B. subtilis* and *R. oligosporus* through inoculation is a highly effective strategy for improving the nutritional and bioactive characteristics of rice bran.

**Conclusion:** In conclusion, the findings of this study may have significant implications for the development of sustainable and economically viable protein sources for poultry feed. Further investigations are recommended to explore the potential applications of inoculating *B. subtilis* and *R. oligosporus* to further enhance the nutritional profile of rice bran.

**Keywords:** Rice Bran, Fermentation, *B. subtilis*, *R. oligosporus*

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