

## Compositional Assessment of Fermented Rice Bran and Rice Bran Oil and Their Effect on High Fat Diet Induced Animal Model

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**Abstract :** Rice bran (RB) and rice bran oil (RBO) are explored as prominent food components worldwide. In this study, fermented rice bran (FRB) was produced by employing edible gram-positive bacteria (*Lactobacillus acidophilus*, *Lactobacillus bulgaricus*, and *Bifidobacterium bifidum*) at  $125 \times 10^5$  spore  $g^{-1}$  of rice bran, and investigated to evaluate nutritional quality. The crude rice bran oil (CRBO) was extracted from RB, and its quality was also investigated compared to market-available rice bran oil (MRBO) in Bangladesh. We found that fermentation of rice bran with lactic acid bacteria increased total proteins (29.52%), fat (5.38%), ash (48.47%), crude fiber (38.96%), and moisture (61.04%) and reduced the carbohydrate content (36.61%). We also found that essential amino acids (methionine, tryptophan, threonine, valine, leucine, lysine, histidine, and phenylalanine) and non-essential amino acids (alanine, aspartate, glycine, glutamine, proline, serine, and tyrosine) were increased in FRB except methionine and proline. Moreover, total phenolic content, tannin content, flavonoid content, and antioxidant activity were increased in FRB. The RBO analysis showed that  $\gamma$ -oryzanol content (10.00mg/g) was found in CRBO compared to MRBO (ranging from 7.40 to 12.70 mg/g) and Vitamin-E content 0.20% was found higher in CRBO compared to MRBO (ranging 0.097 to 0.12%). The total saturated (25.16%) and total unsaturated fatty acids (74.44%) were found in CRBO, whereas MRBO contained total saturated (22.08 to 24.13%) and total unsaturated fatty acids (71.91 to 83.29%), respectively. The physiochemical parameters were found satisfactory in all samples except acid value and peroxide value higher in CRBO. Finally, animal experiments showed that FRB and CRBO reduce the body weight, glucose, and lipid profile in high-fat diet-induced animal models. Thus, FRB and RBO could be value-added food supplements for human health.

**Keywords :** fermented rice bran, crude rice bran oil, amino acids, proximate composition, gamma-oryzanol, fatty acids, heavy metals, physiochemical parameters

**Conference Title :** ICFSN 2024 : International Conference on Food Science and Nutrition

**Conference Location :** Miami, United States

**Conference Dates :** March 11-12, 2024