

Hydrolysis of defatted rice bran using subcritical water

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Rice bran, a by-product of processing brown rice, is known as a natural resource of oil, carbohydrates, and proteins. The process of extracting oil from rice bran is being widely performed commercially. After extracting oil, though, defatted rice still contains abundant cellulose, hemicellulose, and proteins.

In this study, defatted rice bran was hydrolyzed by subcritical water to obtain mono- or oligo-carbohydrates and amino acids. Subcritical water has unique properties such as a higher ionic product ($K_w = 10^{-11}$), and a lower dielectric constant than ambient water. For these reasons, subcritical water can act as an acid catalyst for hydrolysis and good solvent. Subcritical-water treatments of defatted rice bran were performed at various temperatures for 5 min in a batch reactor. The weight ratio of defatted rice bran to water was 1:6. The total carbohydrate content and protein were analyzed by phenol-sulfuric acid method and Lowry's method.