عنوان مقاله:

Production of Rice-By Product Protein Isolate Using the Subcritical Water Extraction Method

محل انتشار:

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خلاصه مقاله:

Background: Subcritical water extraction (SWE) is a friendly technique applied to produce rice by-product extract. The aim of this study is using SWE as a new friendly extraction method for producing protein isolates (PI) of rice bran and rice combination as a byproduct of Iranian agriculture product. Methods: D-optimal combined design was used to optimize bran rice ratio, solid/water ratio, extraction time, and particle size to obtain maximum protein. Bran (۸-۱۲%) and rice ratio (۸۸-۹۲%) solid water (۰.۰۴ -۰.۱۲%), time (۱۵-۴۵ min), and particle sizes (۴۲۰ µm and ۷۱۰ µm) were selected as independent variables, and protein as dependent variable. After optimization, the effects of extraction parameters on functional properties were investigated. Results: Increasing bran/rice ratio has a significant effect on the protein extraction. In this study, the optimum SWE conditions were solid water (۰.۱۲), bran rice ratio (۸:۹۲), time (۴۵ min), particle size (۴۲۰ µm), and the optimum SWE temperature was obtained at ۱۲۰ Cº. SWE also could significantly enhance functional properties, such as the solubility, emulsifying activity index (EAI), and degree of hydrolysis of by-product of rice milling (BRM) PI. Conclusion: According to the positive impact of SWE on protein extraction and the functional properties of BRM PI, this method could be applied as a novel extraction technique to modify the properties of rice protein isolate for functional purposes in the future. However, more investigation is required to study the quantity .and quality of the extracted valuable materials to scale it up for industrial means

کلمات کلیدی:

Rice, Bran, Subcritical water extraction, Protein isolate, Functional properties