

Effects of supercritical fluid extraction conditions on yield of protein from defatted rice bran

ABSTRACT

In the present study, effect of different supercritical fluid extractor (SFE) operational conditions i.e. pressure (300, 450, 600 bars), flow rate (10.0, 17.5, 25.0 g/min), and intervals of extraction (30, 90, 150 min) at 60 °C on protein content of defatted rice bran (DRB) samples, has been evaluated. The DRB samples were collected from SFE vessel and analyzed for their moisture, residual fat and protein contents. The protein content was determined by Kjeldahl method and ranged over 15.59 to 17.44%, while moisture content was determined by drying method and found to be ranging from 7.84 to 9.88%, and residual fat content was determined by Soxhlet method and varied over 4.67 to 18.94%. Differences were selectively significant ($p > 0.05$) among the protein, residual fat, and moisture contents, as function of extraction conditions. Highest yield of protein was obtained at 450 bars, 90 min extraction time, and 17.5 g/min flow rate, while the lowest at 300 bars, 30 min of extraction time, and 10.0 g/min flow rate. Negative correlation with p -value ≤ 0.05 was found between moisture content and residual fat content of DRB. However, no correlation could be observed among protein, moisture and residual fat contents of DRB, respectively. The study demonstrates that SFE conditions have non-significant impact on the yield of protein in defatted materials.

Keyword: Defatted rice bran; Flow rates; Pressure; Protein content; Supercritical fluid extraction; Time of extraction