

Optimization of Ultrasound Assisted Extraction and Characterization of Functional Properties of Dietary Fiber from Oat Cultivar S2000

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Abstract : This study was executed to explore the efficacy of ultrasound-assisted extraction of dietary fiber from oat cultivar S2000. Extraction (variables time, temperature and amplitude) was optimized by using response surface methodology (RSM) conducted by Box Behnken Design (BBD). The effect of time, temperature and amplitude were studied at three levels. It was observed that time and temperature exerted more impact on extraction efficiency as compared to amplitude. The highest yield of total dietary fiber (TDF), soluble dietary fiber (SDF) and In-soluble dietary fiber (IDF) fractions were observed under ultrasound processing for 20 min at 40 °C with 80% amplitude. Characterization of extracted dietary fiber showed that it had better crystallinity, thermal properties and good fibrous structure. It also showed better functional properties as compared to traditionally extracted dietary fiber. Furthermore, dietary fibers from oats may offer high-value utilization and the expansion of comprehensive utilization in functional food and nutraceutical development.

Keywords : extraction, ultrasonication, response surface methodology, box behnken design

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