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Modification of insoluble dietary fibers from bamboo shoot shell: Structural characterization and functional properties

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Abstract: To improve its functional properties, insoluble fiber of bamboo shoot shell (BIDF) was modified by enzymatic hydrolysis and dynamic high pressure micro-fluidization (DHPM). The results showed that, after enzymatic hydrolysis and DHPM treatment, the significantly decreased particle sizes and the marked microstructural changes of BIDF powders were noticed, especially for a honey-comb appearance and large cavities were clearly visible on the surface of DHPM-modified fiber. Crystallinity and thermal stability of modified fibers increased, due to the fact that part of lignin and hemicellulose were removed during the treatments, which was further confirmed by the FT-IR spectra. Compared with unmodified and enzymatic hydrolyzed fibers, DHPM-modified fiber had not only higher water holding capacity, but also more promising binding capacities for oil, nitrite ion, glucose and cholesterol, which might dependent on its decreased particle size and porous structure. The present study suggested that DHPM modification could effectively improve functional properties of BIDF, which promotes its use in food applications.

Key words: insoluble dietary fiber; enzymatic hydrolysis; dynamic high pressure micro-fluidization.

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