Effect of extrusion processing on the structural properties and *in vitro* digestibility of extruded rice: A review

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Abstract

Rice is well-known as a staple food in many parts of the world. During rice dehulling and polishing, about 14% of the rice breaks, which are unacceptable to consumers, and ways to fully utilize those low-value broken rice are urgently needed. Extrusion cooking, which is commonly employed in the production of extruded rice, breakfast cereals, snack foods, pasta, and meat analogue, is a high-temperature short-time process and combines many operations such as mixing, blending, shearing, transportation, compression, heating, shaping, and expansion in one machine. Rotating screws move raw materials forward that undergo irreversible molecular transformations and chemical reactions and thus result in gelatinized/denatured extruded products. This review highlights the research work on the use of extrusion process technology to produce extruded rice products. Numerous detected methods are applied to determine the structural properties of extruded rice such as scanning electron microscopy (SEM), differential scanning calorimetry (DSC), X-ray diffraction (XRD), Fourier transforms -infrared spectroscopy (FT-IR), as well as simulated *in vitro* gastrointestinal digestion technique. The results show that the extrusion process could modify the microstructure and digestibility of rice effectively and be an optimal way to produce stable rice products with lower digestibility.

Keywords: broken rice, extrusion process, structural properties, *in vitro* digestibility

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