

Differences in physicochemical properties of high-moisture extrudates prepared from soy and pea protein isolates.

Autorzy

Hong Wang
Frans W. J. van den Berg
Wei Zhang
Tomasz Paweł Czaja
Longteng Zhang
Birthe Møller Jespersen
René Lametsch

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This study aimed to compare the physicochemical properties of high-moisture extrudates prepared from soy protein isolate (SPI) and pea protein isolate (PPI) at different barrel temperatures (BTs) of 120 °C, 140 °C, and 160 °C. Increasing BT promoted more anisotropic structures and darker extrudates. PPI extrudates produced more fibrous structures than SPI extrudates under the same BT. Textural and rheological properties of SPI extrudates elevated significantly with increasing BT. Compared to SPI extrudates at the same BT, PPI extrudates displayed apparently weaker shear thinning (gel-like) behavior and showed less textural properties of hardness, chewiness, and tensile strength. PPI extrudates showed no significant differences in hardness and chewiness to the cooked chicken breast. Heat-treatment during low-field nuclear magnetic resonance (LF-NMR) measurements promoted the release of intra-space water of the fibrous structure for both SPI and PPI extrudates. Water in PPI extrudates was more prone to migrate compared to SPI extrudates. Hydrogen bonds and hydrophobic interactions played marginally more essential roles than the disulfide bonds to stabilize protein structure for both SPI and PPI extrudates. Sodium dodecyl sulfate-polyacrylamide gel electrophoresis (SDS-PAGE) showed that most protein subunits were still present after extrusion, except two bands over 100 kDa in SPI extrudates extracted by phosphates buffer. This study provided valuable information for improving the quality of high-moisture extrudates based on SPI and PPI.

Słowa kluczowe

High-moisture extrusion, Barrel temperature, Soy protein isolate, Pea protein isolate, Fibrous structure

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