

Correlation between Molecular Flexibility and Emulsifying Properties of Soy Protein Isolate-Glucose Conjugates Based on pH Treatment

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Abstract

The research on the structure-function relationship between the molecular flexibility and emulsifying properties of soybean protein isolate (SPI) under Maillard reaction conditions is still very limited until now. This paper investigated the effects of different pH values (5.0, 6.0, 7.0, 8.0, 9.0) on the molecular flexibility, emulsifying activity and emulsion stability of Maillard reaction products between soybean protein isolate with glucose. As the pH increased, the degree of grafting and browning of soybean protein isolate-glucose (SPI-G) increased significantly. The results of secondary structure analysis showed that the α -helix content decreased, which further proved that the protein flexibility increased. Correlation analysis showed that there was a good correlation between molecular flexibility and emulsifying properties of SPI-G. The correlation coefficient between the molecular flexibility and emulsifying activity of SPI-G was 0.963 ($P < 0.01$), and the correlation coefficient between the molecular flexibility and emulsion stability of SPI-G was 0.879 ($P < 0.05$).

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