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Functional properties of flaxseed gum solutions

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Statement of the Problem: There is a considerable interest in the health benefits and functional properties of flaxseed products. Flaxseed gum (FG), a byproduct of flaxseed meal production, has been widely studied in food production as thickener, emulsifier and foaming agent. FG can be recovered from seed hull by hot-water extraction. Due to the complicated polymer structure of FG and the presence of bioactive compounds, it is predictable that extraction temperature might play an important role in determining FG appearance, physicochemical properties and functional properties. In addition, extraction conditions might also determine the FG quality during storage. The persistence of FG qualities and functional performance during storage are critical in determining its commercial value and utility. Therefore, this research compares the functional properties of FG solutions prepared at two temperatures and the stability of these properties with storage. The purpose of this study is to investigate effects of hot-water extraction on the functional properties of crude flaxseed (*Linum usitatissimum* L. var. CDC Bethune) gum solutions by analyzing foaming, emulsification properties, and gum viscosity as well as tolerance to salt addition and a freeze-thaw cycle. In addition, changes in the appearance of gum solutions during storage at 4°C were also investigated to determine the impact of extraction temperature on gum stability and functional properties.

Findings: FG prepared by extraction at 98°C had lower initial viscosity than FG extracted at 70°C but better stability of viscosity during storage. FG solutions prepared by extraction at either temperature exhibited similar tolerance to salt addition and freeze-thaw cycles. Moreover, the higher extraction temperature produced FG solution with superior foaming and emulsification properties and those properties were also more stable. Foams and emulsions produced from FG extracted at higher temperature also had better stability during utilization.

Conclusion & Significance: By summarizing all findings in this study, FG solution prepared by extraction at 98°C had better and more consistent characteristics including viscosity, foamability, and emulsification properties than FG produced at 70°C. Therefore, although higher temperature extraction requires more energy the FG solution has more stable properties and potentially has more commercial value..

Biography

Yingxue Hu is a current Master's student at College of Agriculture and Bioresources of University of Saskatchewan. She completed her BSc in the Department of Food and Bioproduct Science at the University of Saskatchewan. Her MSc research, under the supervision of Professor Martin JT Reaney, includes investigation of the utility of FG solutions in commercial food products such as healthy beverages

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