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A new way to improve physicochemical properties of potato starch

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Highlights

- Heat-moisture treatment (HMT) improves complexation at elevated temperature
- Heat and shear stability of starch is enhanced due to HMT and complexation
- Higher pasting temperature and lower viscosity of starch is achieved
- Granule-structure remained after 30 min. complexation at 70°C, followed by RVA 85°C

Abstract

Starch is an important class of macromolecules for human nutrition. However, its rapid digestibility leads to a high amount of glucose released into the blood and contributes to a high risk of obesity and type II diabetes. For these reasons, Heat-moisture treatment (HMT) of the starch was applied prior to complexation with linoleic acid to obtain a desired physicochemical properties while preserving its granular structure. The thermal properties, analyzed by DSC, implied that the HMT enhanced the formation of amylose-linoleic acid complexes, particularly when the complexation was succeeded at 70°C. The viscosity behavior studied by RVA demonstrated a higher pasting temperature and lower peak viscosity due to less swelling. The granule-like structure remained after complexation at 70°C for 30 minutes and followed by RVA to 85°C. The combination of the HMT and linoleic acid addition improved the stability of the starch granules towards heating and shearing.

Keywords: heat-moisture treatment, amylose inclusion complexes, linoleic acid, thermal transition, viscosity behavior, potato starch granular structure.

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