

Effects of specific cultivar usage and preparation methods in Japanese potato starches.

ABSTRACT

Potato starch is one of the important agricultural products in Hokkaido, the northernmost and second largest island of Japan. The aim of this study was to evaluate the effects of cultivars and starch preparation methods on the quality parameters of Japanese potato starch. Potato starches from four cultivars, Hokkaikogane, Eniwa, Benimaru and Norin No. 1, grown over a period of several years in Hokkaido were used. The starches produced with tap water in a local starch factory and with distilled water in a laboratory were investigated for phosphorus content, median granule size and peak viscosity and breakdown as determined with a Rapid Visco Analyzer (RVA). Among the starch samples used in this study, significant differences were observed across starch quality parameters. We investigated the differences in quality parameters as an effect of individual cultivars. The starch median granule size among potato cultivars varied in the following order: Benimaru (43.1 μm) > Hokkaikogane (39.1 μm) \approx Eniwa (38.2 μm) > Norin No. 1 (33.9 μm). We found that starches of Hokkaikogane and Eniwa, both with a measurably higher phosphorus content, displayed significantly higher peak viscosity and breakdown than those of Benimaru and Norin No. 1. We also examined the effect that the preparation method has on starch quality parameters within the same potato cultivar. We found that the starch preparation method had a little or no influence on phosphorus content. Median granule size was also completely independent on the preparation method. The RVA evaluation revealed that, even within the same cultivar, starches produced in a factory showed lower peak viscosity and breakdown than those produced in a laboratory.

Keyword: Potato starch; Cultivar, preparation method; Phosphorus content; Pasting properties.