

## Physico-chemical Properties of Starch Mixtures (Cassava and Sago Starch)

Janphen Chainui<sup>1\*</sup>, Mutita Meenune<sup>1</sup> and Taewee Tongdang<sup>2</sup>

<sup>1</sup>Department of Food Technology, Faculty of Agro-Industry, Prince of Songkla University, Hat Yai 90112, Thailand.

<sup>2</sup>Department of Food Science and Nutrition, Faculty of science and Technology, Prince of Songkla University, Pattani 94000, Thailand.

### Abstract

The aim of this work was to investigate the physicochemical properties of cassava and sago starch mixtures. The proportions of cassava starch and sago starch were 94:6, 88:12, 82:18 and 76:24. The amylose content, granule size distributions, crystalline structure, swelling power, pasting characteristics and gelatinization temperature of mixed starches were investigated. The amylose content of cassava and sago starches were 18.42 % and 22.86%, respectively and that of starch mixtures increased when the proportion of sago starch increased. The granules sizes of cassava and sago starch were in average of 12.93  $\mu\text{m}$  and 33.84  $\mu\text{m}$ , respectively. The X-ray diffractogram of all samples showed an A-type pattern with similarity in relative crystallinity. The swelling power of starch was determined in the temperature range of 55-95 °C. It was found that the swelling behavior of mixed starches showed similarity to that of cassava starch rather than to sago starch. The pasting profiles obtained from Rapid Visco Analyser (RVA) showed that pasting temperature and all RVA viscosity parameters of sago starch were higher than those of cassava and mixed starches. Same as swelling behavior, the pasting characteristics of mixed starches were similar to that of cassava starch. This may because of the higher proportion of cassava starch in starch mixtures. The gelatinization process followed by the differential scanning calorimeter (DSC) showed that all DSC parameters of sago starch were higher than those of cassava starch. The gelatinization temperature was fall in the temperature range of 66.85-79.10 °C for sago starch while that of cassava starch was 62.67-76.15 °C. For all mixed starch samples, the conclusion temperatures ( $T_C$ ) increased significantly as the proportion of sago starch increased. In conclusion, the physicochemical properties of the mixtures of cassava and sago starches were slightly altered due to the proportion of sago starch increased. However, they seemed to similar to cassava starch which had higher proportion in starch mixtures than sago starch.

**Keywords:** physicochemical properties, starch mixtures, sago starch, cassava starch

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