Panyarat Sophitprapa 2010: The Modification of *Musa* (ABB) sp. 'Kluai Namwa' (banana) Flour and Starch by Pregelatinization Method. Master of Science (Food Science), Major Field: Food Science, Department of Food Science and Technology. Thesis Advisor: Assistant Professor Masubon Thongngam, Ph.D. 137 pages

Banana flour is not commonly used in food industry due to their poor swelling power and solubility. Pregelatinization is a physical modification, usually used to prepare cold water soluble starch. Pregelatinized banana flour was prepared by using Thai banana cultivar *Musa* (ABB) sp. 'Kluai Namwa' with two drying methods: double drum drier (DNWF) and spray drier (SNWF). For drum drier, the drum gaps were varied (0.15, 0.25 and 0.35 mm). For spray drier, the preheat treatments of flour suspensions were investigated by varying temperature (65, 75 and 85 ^{o}C). All modified banana flours were then examined for their physical, chemical and physicochemical properties. Furthermore, the effect of food ingredients on pasting properties of modified flours was investigated. After modification, both modified methods yielded more yellowish flour. The morphological of native and modified flours were observed by Light microscope and Scanning electron microscope. The starch granules of NWF had elongated and spheroid shape. On the other hand, the DNWF appeared flake-like shape. However, the SNWF still showed intact starch granules like native but some swollen starchs were observed. NWF and SNWF both displayed the typical B-type X-ray diffraction pattern; whereas DNWF had loss their crystallinity. When compared the XRD pattern among SNWF samples, the results showed that as the preheated temperature increased, the peak intensity decreased. When swelling power (SP) of NWF and SNWF was determined, the SP of SNWF was slightly decreased as compared to that of native. After modification, the cold water soluble properties of DNWF were higher; whereas that of SNWF were lower than native. However, the water retentions of both DNWF and SNWF were increased. The gelatinization temperature of NWF was 74.55^{o}C and the transition enthalpy was 14.18 J/g. After modification, the gelatinization temperature and enthalpy (J/g) of DNWF was decreased. In addition, as the preheated temperature increased, the gelatinization temperature of SNWF was increased; whereas their enthalpy was decreased. All DNWF samples showed an instant increase of viscosity but their peak viscosity decreased. For SNWF samples, they had higher pasting temperature and lower viscosity profile compared to native. After modification, resistant starch (RS) content was changed. The RS content of all DNWF samples were lower than 1.2%; whereas that of all SNWF samples were higher than 30%. Then the effect of food ingredients to pasting properties of NWF and modified flours was carried out. The results showed that the pasting temperature of all samples increased but their pasting profiles decreased when added salt and sugar.

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