Wilai Sonthipermpoon 2006: Development of Banana Flake Product : Effects of Water Activity and Glass Transition on Quality and Product Stability. Doctor of Philosophy (Agro-Industrial Product Development), Major Field: Agro-Industrial Product Development, Department of Product Development. Thesis Advisor: Assistant Professor Phaisan Wuttijumnong, Ph.D. 105 pages.
ISBN 974-16-2894-3

The banana pulp from (*Musa* (ABB group), 'Kluai Numwa' variety Mali-Ong was freeze dried and the banana powder was for the used in this study. The experimental adsorption data of freeze dired banana powder showed that the adsorption isotherm at 35°C followed the characteristic sigmoid shape (type II isotherm). The moisture content at monolayer (M_0) calculated by using Guggenheim-Anderson-son-deBor (GAB) equation was 4.24% dry basis. Glass transition temperature (T_g) of banana powder was determined by using differential scanning calorimetry and with Gordon and Taylor equation fitting the data. T_g values was 43.61°C. Empirical The critical water activity (CWA) and critical water content (CWC) of banana powder at 35°C were calculated by linear equation and GAB equation were 0.241 and 2.96 g/100g solids respectively. The outcome of sorption isotherm and glass transition of banana powder were used to formulate banana flake which has T_g higher than room temperature. The effects of 0, 0.9, 1.8 and 2.7% maltodextrin DE 10-12 on quality of banana flake were examined. The T_g values of banana flake were decreased with increasing water activity and increased with increasing the percentage of maltodextrin. The Gordon and Taylor equation and GAB equation were suitable to fit the experimental data of banana flake. Result showed that the M_0, T_g, CWA and CWC were increased by increasing the concentration of maltodextrin. Banana flake (200g) contained maltodextrin 1.8%. The formulation were packed in aluminium foil bags (OPP 30μ/Alu 7μ /LLDPE 5μ). They are kept for 3 months on four storage temperature -18°C, 23°C, 35°C and 45°C, respectively. The results showed with 3 months there was insignificantly physical and chemical changes of banana flakes stored at -18°C, 23°C, 35°C while banana flake kept at 45°C was significantly physical and sensory changes after 50 days. Consumer test was done by 300 people being 9-14 years old. Results showed that 98 % of them accepted this product.

_____ _____ ___ / ___ / ___

Student's signature Thesis Advisor's signature