Jiraporn Sawasdikarn 2012: Effect of Wall Materials on Properties of Tuna Oil Microencapsulation. Master of Science (Food Science), Major Field: Food Science, Department of Food Science and Technology. Thesis Advisor: Assistant Professor Utai Klinkesorn, Ph.D. 147 pages.

The objective of this research was to determine the influence of wall material with maltodextrin on the properties of microencapsulated spray dried tuna oil. Creaming stability, electrical charge (ζ-potential), droplet size and microstructure of liquid emulsion (5 wt% oil, 1 wt% lecithin, 0.2 wt% chitosan) and free oil content of spray dried emulsions (microcapsule) were studied by investigating the types of wall material with maltodextrin (sucrose, lactose, skimmed milk powder, whey protein concentrate and gum arabic). The weight ratio of maltodextrin to each of wall materials was set at 75:25 and total solid content of 30 wt% was used. The results showed that stable liquid emulsions and low free oil content microcapsules were achieved by using the combination of sucrose or lactose with maltodextrin as wall material system. Sucrose or lactose with maltodextrin at the weight ratios of 0:100 5:95 10:90 15:85 25:75 37:63 and 50:50 were employed to prepare the liquid emulsion with the total solid contents of 20, 30 and 40 wt%. After preparation, the emulsions were spray dried and characterized. The results showed that the moisture content and water activity of microcapsule were around 2-3 wt% and 0.3-0.4, respectively. The color of all microcapsules (ΔE) was not significant different ($p>0.05$) from control (use only maltodextrin). Free oil content in microcapsule decreased and encapsulation efficiency increased when the sucrose or lactose ratio and total solid content were increased. The highest encapsulation efficiency of microcapsule was approximately 96.5%. This result was supported by the microcapsule morphology with smooth surface and less pores. The dipersibility of microcapsule indicated that the sucrose-maltodextrin microcapsule has higher dispersibility than lactose-maltodextrin ($p\leq0.05$). The reconstituted emulsions prepared from microcapsule containing sucrose-maltodextrin were stable to creaming and droplet aggregation. These results suggest that the microencapsulated tuna oil with high encapsulation efficiency could produce by using sucrose-maltodextrin combination as wall material. The microencapsulated tuna oil produced in this study could be an ingredient for the nutrition improvement in a variety of food products.

_____ _____ ___ / ___ / ___

Student's signature Thesis Advisor's signature