

Phuttiya Ratanasiriwat 2012: Encapsulation of Wasabi Flavor and Its Application in Canned Tuna Spread. Doctor of Philosophy (Fishery Products), Major Field: Fishery Products, Department of Fishery Products. Thesis Advisor: Associate Professor Wanchai Worawattanamatekul, Ph.D. 106 pages.

Ally Isothiocyanate (AITC), a sulphur compound mainly responsible for the pungent flavor of wasabi, is used as a major flavoring agent in foods. However, absence of its flavor characteristic after high pressure and temperature processing is of great concern for the canned food industry. The objective of this study was to apply encapsulation technology with wasabi to protect AITC loss during the canning process. The microencapsulated wasabi flavor produced from spray drying was investigated with respect to the effects of various kinds of wall materials (HICAP™100, blending of HICAP™100 with maltodextrin, CAPSUL or whey protein concentrate) on physical and chemical properties. Results demonstrated that the emulsion stability and surface AITC of microencapsulated wasabi flavor prepared from HICAP™100, blending of HICAP™100 with maltodextrin or CAPSUL showed higher stability than the microencapsulated wasabi flavor prepared from blending of HICAP™100 with whey protein concentrate. However, there were no difference in the emulsion viscosity, moisture content, water activity, color value and the microstructure of all microencapsulated wasabi flavor. The encapsulated wasabi flavor prepared from HICAP™100, blending of HICAP™100 with maltodextrin or CAPSUL at various flavoring agent concentrations (10, 15 or 20% w/w) were determined for physicochemical properties. All encapsulated treatments were stored at various relative humidity (RH) levels (11, 33 and 52 %RH) and intervally evaluated for encapsulation efficiency (EE) during 60 days of storage. Microcapsules of 20% wasabi flavor derived from the mixture of HICAP™100 with maltodextrin and HICAP™100 with CAPSUL demonstrated excellent properties including low moisture content, acceptable flowing properties, surface appearance and EE. The release rate of encapsulated flavor increased as the RH increased for most encapsulated treatments. A difference-from-control test was conducted to evaluate the magnitude of wasabi flavor retention added in the canned tuna spread. The intensity of wasabi flavor retention in the canned tuna spread with encapsulated flavor agents added was higher than that of the samples without flavor encapsulation.

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