Natdanai Fafaungwithayakul 2010: Effect of Soy Soluble Polysaccharide on the Stability of Soy-Stabilized Liquid Emulsion. Master of Science (Food Science), Major Field: Food Science, Department of Food Science and Technology. Thesis Advisor: Associate Professor Parichat Hongsprabhas, Ph.D. 79 pages.

This study used soy soluble polysaccharide (SSP) and pectinase-hydrolyzed soy soluble polysaccharide (PH-SSP) from okara, a soy residue from soy milk production, as the sources of dietary fiber in oil-in-water emulsions. It was found that although pectinase hydrolysis generally shortened the molecular weight of SSP, self-association of PH-SSP occurred after hydrolysis, resulting in the formation of large particles confirmed by SDS-PAGE and Zetasizer Nano-ZS. Pectinase-hydrolyzed soy soluble polysaccharide could induce morphological changes in murine macrophage RAW 264.7. The addition of reconstituted PH-SSP (0-2%) to the liquid emulsion containing 3.75% soy protein isolate (SPI) and 3.33% refined rice bran oil resulted in excessive sedimentation at pH 2.0 ($p<0.05$). This was likely due to associative phase separation mechanism of positively charged SPI and negatively charged PH-SSP. At pH 7.0, which was above isoelectric pH of SPI, charge repulsion between negatively charged SPI and negatively charged PH-SSP reduced the formation of insoluble coacervate ($p<0.05$). Nevertheless, the formation of insoluble coacervate could be lowered by using the heat-denatured SPI. Moreover, preferential distribution of SPI in serum phase of emulsion was also regulated by pH. Adding PH-SSP up to 6% did not alter emulsion capacity during *in vitro* digestion; however, it resulted in the destabilization of o/w emulsion under peptic and tryptic digestion. Overall, this study proposed the methods in controlling oil-in-water emulsion stability and the reduction of insoluble coacervate in soy-based emulsions containing soy soluble polysaccharide and its pectinase-hydrolyzed products.

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