

Improving Oxidative Stability of Encapsulated Krill and Black Cumin Oils and its Application in Functional Yogurt

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Abstract : This study aimed to produce functional yogurt supplemented with microencapsulated krill oil as a source of omega 3, which is known, to maintain the normal brain function, reduce the risk of cancer, and preventing cardiovascular disease. Krill oil was mixed with black cumin oil (1:1) in order to increase its oxidative stability. β -carotene (10 mg/100 ml) was used as a standard antioxidant. Maltodextrin (MD) was mixed with whey protein concentrate (WPC) and gum Arabic (GA) at the ratio of 8:2:0.5 ratios and used for microencapsulation of single or mixed oils. The microcapsules were dried by freeze and spray drying in order to maximize encapsulation efficiency and minimize lipid oxidation. The feed emulsions used for particle production were characterized for stability, viscosity and particle size, zeta potential, and oxidative stability. The oxidative stability for mixed krill oil and black cumin oil was the highest. The highest encapsulation efficiency was obtained using spray drying, which also showed the highest oxidative stability. The addition of encapsulated krill and black cumin oils (1:1) powder in yogurt manufacture reduced slightly effects on the development of acidity, textural parameters, and water holding capacity of yogurt as compared to control.

Keywords : Krill oil, black cumin oil, micro-encapsulation, oxidative stability, functional yogurt

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