Thesis Title Fortification of Milk Powder with Beta-carotene Extracted from Crude Palm Oil

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ABSTRACT

Drying of milk fortified with beta-carotene extracted from crude palm oil by a spray dryer was studied. The co-current and counter-current flows of spray drying were compared. Carotenoids solubilities in soybean and sunflower oils were also compared. HPLC was used to analyze the total beta-carotene contents.

The highest stability of alpha and beta-carotenes was obtained when soybean oil was used to dissolve carotenoids and dried using counter-current flow with inlet air temperature of 175°C, nozzle pressure atomizer number 1.5, pump pressure of 15 bar, blower speed of 35 Hertz, pump speed of 25 Hertz and flow rate of 200 mL/min. At the storage time of 100 days, the content of total beta-carotene in milk powder produced at optimum condition decreased by 54%. Some of *trans*-isomers of carotenoid derivatives changed to *cis*-isomers. The Hunter L, a* and b* values were 75.81, +4.81 and +33.19, respectively. The total plate count was less than 250 CFU/g. The fortified milk powder was less acceptable than the control and the commercial milk powders ($p \leq 0.05$).