



Oxidative and physical stability of fish oil-in-water emulsions stabilized with sodium caseinate and DATEM

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Abstract title

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Poster Presentation

An optimization study was carried out in order to evaluate the physical and oxidative stability of high fat (50-70%) omega-3 delivery fish oil-in-water emulsions stabilized with combinations of sodium caseinate (CAS) and commercial diacetyl tartaric acid ester of mono- and diglycerides (DATEM). It is hypothesized that combined use of emulsifiers and surfactants provides less viscous emulsions which makes it easier to incorporate delivery emulsion into food products. The influence of 3 factors related to emulsion composition (fish oil content: 50, 60 and 70%; total amount of CAS and DATEM: 1.4, 2.1 and 2.8 %; and ratio between CAS and DATEM: 0.4, 1.2 and 2) on physical (droplet size, viscosity and zeta potential) and oxidative (peroxide value and volatile

oxidation products) parameters were evaluated. After executing a Box-Behnken design, statistical modelling and optimization was performed. The best performing recipe was determined to be 70% fish oil, 2.8% total emulsifier and a ratio of 2 for the combination of CAS:DATEM. Results of optimization study showed that creaming decreased with increasing fish oil and total emulsifier content, whereas, droplet size was affected by all variables. Viscosity decreased with the decreasing fish oil content, however no significant effect of variables was found on peroxide value. Volatile compounds were formed in lower amounts with the increased ratio of CAS to DATEM, confirming good antioxidative effects of CAS.