Optimization of Fish Oil Spray Drying Using a Protein:Inulin System

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Abstract

The aim of this work was to investigate the use of an unconventional polymeric material, inulin, in fish oil spray drying. The influence of inlet air temperature, oil load, and carrier substitution (whey protein isolate by inulin) on the physical properties of particles containing fish oil was investigated. Increasing the oil load caused an increase in the surface oil; however, the presence of inulin favorably decreased the particle surface oil when a high oil load was applied. The parameters hygroscopicity and wettability were also influenced by the inulin fraction. The higher inlet air temperature produced larger particles with lower densities. The best operating conditions were determined to be an air temperature of 185°C, a 40% inulin fraction, and a 6% oil load. The results indicate that inulin is an alternative carrier in the fish oil spray-drying process.
Keywords: Encapsulation, Fructan, Omega-3, Response surface methodology, Spray drying, Whey protein

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