Microencapsulation of Omega-3 fatty acids for enhancing their stability

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ABSTRACT

Microencapsulation of omega-3 oil and biomass enriched in omega-3 fatty acid was investigated via ionic gelation and complex coacervation to enhance their stability. It was observed that gelation process, had a significant effect on the encapsulation efficiency and on bead properties. The alginate-oil emulsion (alginate 2%v/v with an oil loading 10%, v/v) resulted in an encapsulation efficiency of 95% and found to be stable. Under similar condition, when biomass was encapsulated the efficiency was 94%. Similarly, other wall materials such as maltodextrins and gelatin were used to encapsulate the omega-3 oil. The beads were spherical that resulted in improved encapsulation efficiency 96%. In complex coacervation, the optimum ratio between gelatin A, sodium alginate and pH to form a coacervate complex was found to be 1.4:0.8 and 3.6, respectively. Storage stability was significantly high when maltodextrin and gelatin wall material was used as compared to alginate beads ($p<0.05$). During 5-day oxidative stability analysis, beads and coacervates exhibited significantly high ($p<0.05$) stability.