

# **Development of Innovative Lipid-Based Ingredients for Microencapsulation of Fish Oil**

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Encapsulation of fish oil for use in food products is gaining increasing interest. Fish oil can be encapsulated in an emulsion-based system in which surface-active compounds form a protecting shell around fish-oil droplets in an aqueous system. In this work, novel surface-active lipid compounds which can be used for encapsulation of fish oil will be developed by modification of alginate oligosaccharides. Alginate is a major cell wall material of marine algae; alginate can hence be considered as an unlimited, renewable resource due to the abundance of marine algae. In this work, sodium alginate has been enzymatically depolymerized by alginate lyase and the resulting alginate oligosaccharides have been characterized in terms of composition and anti-oxidative properties. The alginate oligosaccharides will be hydrophobically modified by esterification with fatty acids to produce a range of surface-active compounds. In the development of a suitable esterification method, glucuronic acid has served as a model compound for the depolymerized alginate. This work presents the results of the esterification of glucuronic acid with fatty acids of varying chain length. The reaction conditions have been optimized to reach a high yield of the glucuronic acid fatty acid esters.