



Fish oil encapsulation and its application in the food industry: A review

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Abstract:

Fatty acids with double bonds beyond the ninth carbon from the carboxyl end classified as essential for human health, including omega-3 fatty acids: eicosapentaenoic acid (EPA) and docosahexanoic acid (DHA). Fish oil contains both EPA and DHA. Beneficial effects of fatty acids include lowering cholesterol, reducing the risk of arrhythmias, lowering blood pressure, preventing diabetes in pregnancy, and having positive effects on joints (relieving osteoarthritis). Fish oil is susceptible to oxidative degradation generating undesired lipid peroxides, secondary and tertiary oxidation products. These products pose health risks, reduce shelf-life stability and cause fishy odor and taste leading to decreased sensory quality. Therefore, microencapsulation can solve this problems related to the sensitivity of fish oil to oxidation and its unpleasant odor. Microencapsulation is the process of surrounding or enveloping one substance within another substance on a very small scale, yielding capsules ranging from less than one micron to several hundred microns in size. Microencapsulation is used in a wide range of industrial, engineering, pharmaceutical, biotechnology and research programs; for example, microencapsulation technology can protect active materials against environment, stabilize them and prevent or suppress volatilization. Fish oil microencapsulation achieved using coating materials such as chitosan, gelatin, maltodextrin, starch, whey proteins and plant gums via spray drying, coacervation, ultrasonication and membrane emulsification techniques. Therefore, in the present study, we examine the research conducted on the encapsulation of fish oil and their advantages, methods and results.

Keywords: Encapsulation, Fish oil, Functional, Food industry