

Stability Improvement of Omega-3 Lipids and its Application in Baking

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Omega-3 (ω -3) lipids are closely related to human health and have positive effects on the heart, brain, bone, vision, intestine, and even mood. However, current intake of omega-3 lipids is severely lacking. Besides insufficient consumption of marine products, this is also related to the nature of omega-3 lipids. Omega-3 lipids are prone to oxidation and decomposition, and produce harmful substances such as acrylamide and furan after oxidation, accompanied by an unpleasant fishy smell. All these pose significant challenges to the application of omega-3 lipids in food.

In this study, the bigel system (combination of oleogel and hydrogel) was used to encapsulate the omega-3 lipids. The inner layer was an oleogel of algal oil obtained under the action of the gelators, preventing the outward migration of algal oil. The outer layer was hydrogel, which provided corresponding protection to the inner layer (algal oil oleogel). By combining oleogel and hydrogel, a stable bigel product was prepared. This product had good stability and could maintain its integrity even at high temperature, thereby enhancing the stability of omega-3 lipids, and even could be used in baking. After encapsulation, the baking losses of DHA and EPA were reduced by 77.9% and 74.8% respectively, and the fishy smell had also been significantly improved.