



The impact of enriching whey protein isolate with essential oils from *Cuminum cyminum* on the chemical characteristics of Silver carp fillet.

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Abstract

This study examined the impact of using a Whey protein isolate coating combined with *Cuminum cyminum* essential oil (CCEO) as an antioxidant agent on the quality and shelf life of silver carp fillets stored in a refrigerator.

The whey protein isolate coating was prepared using different concentrations of CCEO, namely 0%, 0.3%, 0.45%, and 0.6%. The antioxidant properties of the packaged fillet sample were evaluated and examined at a temperature of 4 °C for a duration of 0, 1, 3, 5, 7, 9, 11, 13, and 15 days.

The utilization of whey protein isolate in combination with 0.6% CCEO successfully inhibited the rise in thiobarbituric acid (TBA), total volatile base nitrogen (TVB-N), peroxide value (PV), and pH levels in the silver carp fillets.

The findings suggest that using a whey protein coating with CCEO can prolong the freshness of silver carp fillets when kept in refrigerated circumstances for a maximum of 15 days, without negatively impacting their flavor, scent, or texture.

Our research findings indicate that the application of a whey protein coating with CCEO can effectively prolong the shelf life of silver carp fillets when stored in the refrigerator.

Keywords: Whey protein isolate, *Cuminum cyminum*, essential oil, silver carp.