Inhibitory impacts of natural antioxidants (ascorbic and citric acid) and vacuum packaging on lipid oxidation in frozen Persian sturgeon fillets

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Abstract

This study was aimed to investigate effects of aqueous citric acid (CA) and ascorbic acid (AA) on lipid oxidation in comparison with effect of vacuum packaging in order to find better treatment to delay improper changes in the Persian sturgeon (*Acipenser persicus)* fillets during frozen storage due to lipid oxidation. In this study traditional packaging, vacuum packaging, ascorbic acid solution (0.5 %) and citric acid solution (0.5 %) were considered as treatments. Rancidity development was measured by several biochemical indicators including Free Fatty Acids, Peroxide values and Thiobarbituric acid. Also pH, expressible moisture and sensory properties were measured during 6 months storage. Results showed that free fatty acid (FFA), primary and secondary oxidation products of control samples were significantly higher than those in other treatments ($p<0.05$). Also, expressible moisture and pH value of treated samples were significantly lower than those in control ($p<0.05$). However both antioxidants (AA and CA) extended shelf life of frozen fillets but rancidity development in CA treated samples was higher than other samples during storage. Results showed that all three treatments had significant effect on delaying lipid oxidation ($p<0.05$) but usage of AA and vacuum packaging had the best effect on delaying lipid oxidation and increasing shelf-life of fillets ($p<0.05$). Thus the employment of AA and vacuum packaging alone or in combination with other protective strategies is recommended.

Keywords: Persian sturgeon, Antioxidant, Citric acid, Ascorbic acid, Vacuum packaging, Rancidity

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