

**Title** Antioxidant effects of chitosan in Atlantic salmon mince during refrigerated storage  
**Author** M. Hammond and D.I. Skonberg  
**Citation** Book of Abstracts, 2004 IFT (Institute of Food Technologists) Annual Meeting and Food Expo, 13-16 July 2004, Las Vegas, Nevada, USA. 321 pages.  
**Keywords** salmon; chitosan

### **Abstract**

Omega-3 fatty acids play important roles in promoting human health. Atlantic salmon has a high content of omega-3 fatty acid, however, the acids are highly susceptible to oxidation, particularly when the salmon is minced for incorporation into value-added seafood products. The objective of this study was to evaluate the efficacy of various chitosan solutions in reducing lipid oxidation in minced salmon fillets. Fresh, minced Atlantic salmon was mixed with varying concentrations (0.5% and 1.0%, based on mince weight) and varying sizes of chitosan (low molecular weight (LMW); 30 min enzymatically degraded; and 24 h enzymatically degraded) dissolved in 1.0% acetic acid. The effects of adding 1.0% ascorbic acid (AA) or 1.0% AA plus 1.0% mixed tocopherols to the chitosan were also studied. A total of 10 treatments, including an untreated control and an acetic acid control, were prepared. The mince treatments were prepared in triplicate and stored at 3 °C for 13 d. On d 1, 3, 6, 8, 10, and 13, samples were subjected to TBA, instrumental color (L\*, a\*, b\*), and GC headspace analysis of propanal, hexanal, and total volatiles. “L” values increased and “a” values decreased in all treatments during refrigerated storage, with the untreated control having significantly ( $P < 0.05$ ) lower “L” values than all treated samples. TBA values significantly increased in all treatments with storage, ranging from 0.16 on d 1 to 3.52 microgram/ gram on d 13. The LMW chitosan with 1.0% AA and 1.0% mixed tocopherols (IT) and the LMW chitosan with 1.0% AA (IS) resulted in the lowest TBA values throughout the study. Levels of propanal were lowest in the IT and IS treatments, and reached a high of 10.32 nmol/g in the acetic acid control. These results indicate that oxidation in salmon mince can be successfully retarded during refrigerated storage with the combined use of LMW chitosan, AA, and mixed tocopherols. Enzymatically degraded chitosan provided no additional antioxidative effects.