

Title Antimicrobial efficacy of chitosan coating against *Listeria monocytogenes* in fresh salmon  
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### Abstract

Contamination of *Listeria monocytogenes* (LM) in salmon is of major concern to the seafood industry. Salmon can be contaminated with LM during processing and LM can multiply during refrigerated storage. Coating of salmon fillets with chitosan (an inherent antimicrobial) with or without added antimicrobial agents may suppress microbial growth, thus enhancing safety and shelf-life of salmon fillets. Our objective was to evaluate efficacy of chitosan coatings with or without nisin against LM in fresh salmon during an 8 d refrigerated storage. Four 1% chitosan solutions (in 1% acetic acid) were prepared from high (1,100 kDa, HMw) or low (470 kDa, LMw) molecular weight chitosan with or without added nisin (10 mg/10 ml chitosan solution). Salmon fillet portions (5 g) were inoculated with an overnight decimally diluted culture of LM, and then coated with chitosan solution. Control coating solutions were nisin (10 mg/10 ml sterile PBS), 1% acetic acid, and/or no coating. Samples were incubated at 4 °C and bacterial counts determined at days 0, 2, 4 and 8. Samples were spread-plated onto UVM agar plates, incubated at 37 °C for 48 h and CFU/g determined. Three separate experiments were conducted. Data were statistically analyzed ( $\alpha=0.05$ ). All chitosan-coated salmons (except LMw-nisin at d 8 had significantly lower LM counts compared to that of the non-coated salmons throughout the 8-d storage. At d 0, the HMw-nisin coating caused a 2-log CFU/g reduction from the initial 6.7 log CFU/g of LM inoculated onto the salmon surface. No significant difference in CFU/g (ca. 6-6.2 log) of LM was observed in salmon coated with LMw-nisin, HMw, or HMw-nisin after 8 d. Nisin alone was not effective against LM after 4 d of storage. This study indicated that chitosan coatings (LMw and HMw) might be an alternative for the control of LM on the surface of fresh salmon fillets during refrigerated storage.