

Title Evaluation of antimicrobial activity of chitosan-methyl cellulose composite films containing nisin or lauric acid

Author Sunil Mangalassary and Kay Cooksey

Citation Symposium Guide, 24th Symposium on Packaging, May 17-20, 2009, Greenville, SC, USA. 54 pages.

Keyword antimicrobial activity; chitosan-methyl cellulose; lauric acid

Abstract

Antimicrobial packaging can be employed as an effective intervention method to encounter the post-processing contamination of foods. Use of biopolymers in food packaging is gaining momentum as the industry moves more towards sustainable packaging. Chitosan and methyl cellulose have excellent film forming properties and in combination may be able to compensate some of the disadvantages when used individually. Nisin and lauric acid are two natural antimicrobial compounds found effective especially against Gram positive food pathogens like *Listeria monocytogenes*. The objective of this study was to evaluate the antimicrobial activity of chitosan-methyl cellulose films containing nisin or lauric acid against *Listeria monocytogenes*. The antimicrobial activity was assessed at different stages of film production using different methods. Antimicrobial activity of a film forming solution was measured using a spot on lawn assay as well as using liquid incubation method and that of a completely formed film was measured using film on lawn, liquid incubation, and direct inoculation methods. The antimicrobial activity obtained for film forming solution and the film was compared against the inhibitory effect obtained by using standard solution of nisin and lauric acid in order to understand whether there was a loss of activity during different stages of film formation. The effect of chitosan-methyl cellulose films against *Listeria monocytogenes* in a ready to eat turkey bologna and cheddar cheese was also evaluated during storage at refrigeration temperature for 21 days. Results from this study showed that chitosan-methyl cellulose films containing nisin or lauric acid were effective in inhibiting *Listeria monocytogenes* in all the methods tested and also the films effectively reduced the bacterial population on the food products tested during refrigerated storage.