

**Title** Effect of antimicrobial incorporated soy protein isolate coated OPP/PE films on sprouts packaging

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### Abstract

**Introduction:** Naturally derived antimicrobial (AM) agents such as cinnamaldehyde, garlic oil, rosemary oil, allyl isothiocyanate (AIT), have proved as effective against a wide range of microorganisms. This study was focused on the effect of antimicrobial incorporated soy protein isolates (SPI) coated OPP/PE films on extending the shelf life of fresh sprouts. Since fresh sprouts are minimally processed, plant tissues are damaged causing shortened shelf life. **Materials and Methods:** Antimicrobial effectiveness of cinnamaldehyde, garlic oil, AIT, and rosemary oil was confirmed by minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) tests against *E. coli* 0157:H7, *Salmonella typhimurium*, *Bacillus cereus*, *Listeria monocytogenes* and *Enterobacter sakazakii*. AM films and coatings were prepared by incorporating different concentrations of above mentioned AM compounds into SPI solutions and film properties were investigated. Laminated OPP/PE films were made into AM packages by heat sealing. Alfalfa, broccoli, and radish (30g) were put into AM Packages and stored at 10°C temperature for 5 days. Initial total microbial count of sprouts (10g) was taken and continued at every 24 hour. **Results and Discussion:** MIC and MBC of AM compounds against tested microorganisms were in the range of 0.1%-0.5% (v/v). Tensile strength, elongation at break, and water vapor permeability of OPP/PE films have been affected significantly due to lamination. A significant reduction of total microbial count of sprouts was observed in AIT coated packages followed by cinnamaldehyde. Least effective was the rosemary oil coated films. The most effective concentration for every AM compound was 1.2% followed by 1.0%. The quality aspect of the sprouts was at a satisfactory level except for rosemary oil coated packages. Conclusively, these results indicates that AM packaging with antimicrobial coatings are effective in controlling microbial growth in sprouts and can be used to prolong the shelf life of sprouts.