

Title Effect of coating films on the quality and shelf-life of modified atmosphere (MA) packed sprouts

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Abstract

Introduction: Sprout is one of the minimal processed vegetables. Due to minimal processing, plant tissues are damaged resulting high level of respiration, faster rate of deterioration and shortened shelf-life. There fore, modified atmosphere packaging (MAP) needs as an alternative to extend the shelf-life of sprouts. The objective of this study was to develop OPP/PE films coated with soy protein isolate-montmorillonite (SPI-MMT) composite with different barrier properties and to investigate the effect of MAP on quality characteristics and shelf life extension of sprouts. **Materials and Methods:** SPI-MMT coated films were prepared by coating SPI-MMT solution on OPP/PE films. Sprouts (broccoli, radish, alfalfa) were packed in different packages coated with different concentrations of MMT (0-15 w/w %) incorporated into SPI solution and uncoated packages were used as the control. All sprout samples were kept under refrigeration. Respiration rate, head space gas composition, color and quality aspects (appearance, off-flavor) were investigated during the storage. Also, oxygen and water vapor permeability of coating films were investigated. **Results and Discussion:** Since SPI-MMT coated films controlled the oxygen permeability, coating films were effective in achieving equilibrate atmosphere more efficiently than the control. Also, SPI-MMT coated films maintained more stable gas composition, reducing respiration rate and minimizing the quality changes. Samples packed in uncoated packages showed highest level of respiration rate, low O₂ concentration causing anaerobic condition and development of off-flavors. When sprouts were stored at low temperature, head space gas compositions and respiration rate changed at the beginning and remained constant for rest of the period. Effect of the coating films was not obvious at low temperature. SPI-MMT coated films were significantly effective to avoid anaerobic condition within packages and to improve the quality of sprouts compared to non-coated films. Consequently, SPI-MMT coated film was found to be effective in maintaining quality and prolonging the shelf-life of sprouts.