

Title Effects of Tapioca Starch/Decolorized Hsian-Tsao Leaf Gum-Based Active Coatings on the Quality of Minimally Processed Carrots

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Citation Food and Bioprocess Technology, 2011

Keywords Edible coating; Respiration rate; Headspace gas; Antimicrobial; Fresh-cut carrots

Abstract

Edible coatings made from tapioca starch/decolorized hsian-tsao leaf gum (dHG) containing cinnamon essential oil or grape seed extract (GSE) were developed and applied to minimally processed carrots. Coatings based on 0.3% dHG and 1.7% tapioca starch were prepared and incorporated with 0.1–0.3% cinnamon oil or 0.3–0.6% GSE as antimicrobial agents. Fresh-cut carrots were immersed into coating solutions, placed in expanded polystyrene trays, and sealed in polypropylene bag. Changes in the initial respiration rate, the headspace atmosphere, color, microbial growth, and sensory evaluation were then measured. During refrigeration, the initial respiration rates for carrots with various coating treatments slightly increased as compared to the control group carrots, and the coatings with cinnamon oil showed the highest rates. Headspace analysis revealed that coated samples also had higher CO₂ and lower O₂ concentrations, which were consistent with the initial respiration rate results. Though samples coated with the antimicrobial solutions (cinnamon oil or GSE) did not show advantages in reducing microbial growth as compared to the control group carrots, they presented better acceptance during the sensory evaluations. The use of edible coatings successfully maintained the surface appearance and retarded the formation of “white blush” on the surface of carrots during refrigeration. While the visual appearance quality of minimally processed carrots was significantly improved by the coating treatments, the microbial growth was the same or even worse in some cases. Based on the pronounced improvements of the carrots’ appearance and the comparable microbial control, the plain starch/dHG coating without cinnamon oil or GSE was recommended for extending the shelf life of minimally processed carrots.

<http://www.springerlink.com/content/y2ul85333246872p/fulltext.pdf>