

Title Combined effects of sodium chlorite dip treatment and chitosan coatings on the quality of fresh-cut d'Anjou pears

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Abstract

This study evaluated the effects of sodium chlorite (SC) alone and its sequential treatment with edible coatings on browning inhibition and quality maintenance of fresh-cut d'Anjou pears. Edible coatings were prepared from chitosan (CH) and its water-soluble derivative carboxymethyl chitosan (CMCH), separately. Pear wedges were immersed in SC solution, followed by coating with CH or CMCH solutions. The samples were packed in unsealed bags and stored at 4 °C for subsequent color, firmness, and weight loss measurement. The effects of the SC and coating treatments on polyphenol oxidase (PPO) inhibition and microbial inactivation were also evaluated. Results indicated that SC exhibited significant ($P < 0.05$) inhibition of browning and PPO activity. The SC treatment was also strongly effective in inactivating *Escherichia coli* O157:H7 on pear slices. Coating SC-treated pear slices with CH adversely affected the quality of pear slices by accelerating the discoloration of cut surfaces and increasing the PPO activity. On the contrary, coating SC-treated samples with CMCH significantly prevented the browning reaction and inhibited PPO activity. In addition, SC and CH/CMCH coatings maintained tissue firmness and did not affect weight loss. Our study may provide a scientific basis for the use of SC + CMCH treatment as an alternative preservation treatment for fresh-cut fruits and vegetables.