

**Title** Dual effectiveness of sodium chlorite for enzymatic browning inhibition and microbial inactivation on fresh-cut apples

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### **Abstract**

The dual effectiveness of sodium chlorite for browning inhibition and microbial inactivation on fresh-cut apples was investigated and compared to other anti-browning and antimicrobial agents. Results indicate that sodium chlorite significantly ( $P < 0.001$ ) inhibited the browning reaction of fresh-cut Red Delicious apples stored at 5 °C for 14 days. This treatment also significantly reduced polyphenol oxidase activities. Treatments with acidified sodium chlorite, calcium chloride, or calcium ascorbate exhibited strong inhibition on apple browning during the early storage, these treatment effects diminished after 7 days in storage. Combining calcium chloride with sodium chlorite further significantly ( $P < 0.001$ ) improved the firmness of apple slices, and browning inhibition during storage. Additionally, treatments with acidified sodium chlorite, sodium chlorite, or the combination of sodium chlorite and calcium chloride significantly ( $P < 0.001$ ) reduced *Escherichia coli* populations on fresh-cut apples by 3.0, 3.6, and 3.9 log cfu g<sup>-1</sup> over the water control. The dual effectiveness of sodium chlorite to inhibit enzymatic browning and inactivate *E. coli* may allow this compound to achieve a prominent role in improving the quality and safety of products in the fresh-cut apple and other food industries.