

**Title** Post-harvest treatment effects on quality and safety characteristics of melons and tomatoes

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**Citation** Thesis, Doctor of Philosophy (Food Science), Colorado State University. 292 pages. 2008.

**Keywords** Postharvest; Calcium chloride; Melons; Tomatoes; Quality; Safety

### Abstract

Production, processing, and transport of high quality, safe, and healthful produce presents a constant challenge. Calcium chloride ( $\text{CaCl}_2$ ) dips have been shown to help maintain fruit quality after harvest by delaying senescence, reducing postharvest decay, and controlling many physiological disorders in fruit. There is little research available, however, assessing the effects of  $\text{CaCl}_2$  on sensory, nutritional, and microbial qualities of fresh, whole produce, including melons and tomatoes. This research project evaluated the impact of post-harvest storage temperature and use of a  $\text{CaCl}_2$  dip on selected organoleptic, nutritional, and microbiological qualities of organic and conventional Colorado-grown melons and tomatoes over time. Melons (cultivars 'Haogen' and 'Arava') were grown on conventional and certified organic plots and tomatoes (cultivar 'Early Girl') were grown on certified organic plots during summer 2007 with controlled pre-harvest, harvest, and post-harvest conditions. All produce was picked at peak maturity and either dipped in a  $\text{CaCl}_2$  solution or not treated, then stored at  $10^\circ \pm 1^\circ$  or  $21^\circ \pm 1^\circ\text{C}$ . A variety of sensory, nutritional, and microbial tests were conducted on the fruit after storage for 1, 5, and 10 days. Storage temperature significantly impacted many of the fruit characteristics evaluated. Melons stored at  $10^\circ\text{C}$  had less microbial growth and higher sensory scores compared to the melons stored at  $21^\circ\text{C}$ . For tomatoes, many of the sensory and nutritional qualities were higher when stored at  $21^\circ\text{C}$ , even at 10 days storage. Use of a  $\text{CaCl}_2$  dip treatment positively influenced ( $p < 0.05$ ) sensory scores for melons (appearance, texture, and overall acceptability) and tomatoes (flavor and overall acceptability). Overall,  $\text{CaCl}_2$  did not affect the fruits' antioxidant contents. When storing organic melons at  $21^\circ\text{C}$ , the  $\text{CaCl}_2$ -dipped melons had lower ( $p < 0.05$ ) Enterobacteriaceae bacterial counts compared to non-dipped melons. Based on this study, a  $\text{CaCl}_2$  treatment shows promise for increasing some safety and sensory characteristics of fresh melons and tomatoes, especially for produce stored at room temperature ( $21^\circ\text{C}$ ). Additional research should be conducted to further explore the potential of  $\text{CaCl}_2$  to lessen post-harvest expenses and losses while maximizing the sensory, nutritional, and safety characteristics of fruit.