

Multistate Research Project S-294
Postharvest Quality and Safety in Fresh-cut Vegetables and Fruits

2007-2008 Activities Report

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Activities

Objective 3. Improve understanding of biochemical, physiological and molecular mechanisms that affect fresh-cut product quality.

Evaluation of New Apple Cultivars and 1-MCP for Fresh-Cut Apple Slices

In collaboration with Peter Toivonen, AAFC – Summerland, BC

- ‘Eden’ has potential for use in fresh-cut apple slices because of its reported reduced browning upon cutting. However, ‘Eden’ apples appear to be chilling sensitive and optimum storage conditions need to be determined in order to have these fruit available to industry throughout the year. ‘Eden’ from all storage regimes evaluated in this study developed some degree of tissue browning and the disorders were different than those observed in the previous year. Additional years of postharvest studies are needed to better understand this cultivar and to develop successful storage recommendations.
- The use of AAFC new technology (NT) inside the packages of fresh-cut apple slices substantially reduced decay development in all cultivars evaluated. The NT treatment also improved firmness and reduced color change in apple slices, but the level of effect was dependent on cultivar and time in post-slice storage at 5°C. There was little benefit of including 1-MCP in with the Nature Seal solution (standard anti-browning dip), nor was there any benefit to dipping slices in a Fresh Seal solution.
- Several practices can affect whole fruit quality during long-term storage and consequently influence slice quality. After 6 months of standard CA storage, apple slices made from the later harvest had substantially more decay than those from the first harvest. Apples treated with SmartFresh (1-MCP) also had slightly more slice decay. ReTain and diphenylamine (DPA) had no significant effects on slice browning. After 9 months of storage, apples from the second harvest could not be used for slices because of internal/flesh browning. At this time, slices from 1-MCP-treated fruit from the first harvest had much less browning than those not treated. Similarly, slices made from DPA-treated apples exhibited less decay and better quality ratings. Consistently throughout the study, slices from apples held for 7 days in ambient air prior to slicing had less browning than those held for 2 days. Hence, a few days of holding apples in refrigerated ambient air after CA storage appears to improve slice quality. This entire study using ‘Empire’ is currently being repeated for the 2007-08 storage season.

Publications:

2007-2008

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DeEll, J., B. Eshani-Moghaddam, and P. Toivonen. 2008. Postharvest treatment of 'Empire' apples influences quality of fresh-cut slices. *Orchard Network* 12(1):12.

Previously

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Rupasinghe, H.P.V., D.P. Murr, J.R. DeEll, and J. Odermeru. 2005. Influence of 1-methylcyclopropene (1-MCP) and NatureSeal on the quality of fresh-cut 'Empire' and 'Crispin' apples. *J. Food Qual.* 28:289-307.

DeEll, J.R., D.P. Murr, R. Mueller, L. Wiley, and M.D. Porteous. 2005. Influence of 1-methylcyclopropene (1-MCP), diphenylamine (DPA), and CO_2 concentration during storage on 'Empire' apple quality. *Postharvest Biol. Technol.* 38:1-8.

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