

**Title** Storage temperature and time influences sensory quality of mandarins by altering soluble solids, acidity and aroma volatile composition

**Author** David Obenland, Sue Collin, Bruce Mackey, James Sievert and Mary Lu Arpaia

**Citation** Postharvest Biology and Technology, Volume 59, Issue 2, February 2011, Pages 187-193

**Keywords** Mandarins; Off-flavor; Storage; Aroma volatiles; Acidity; Soluble solids

### **Abstract**

Mandarins are very prone to losing flavor quality during storage and, as a result, often have a short shelf life. To better understand the basis of this flavor loss, two mandarin varieties ('W. Murcott' and 'Owari') were stored for 0, 3 and 6 weeks at either 0 °C, 4 °C, or 8 °C plus 1 week at 20 °C, and then evaluated for sensory attributes as well as quality parameters and aroma volatile profile. The experiment was conducted multiple times for each variety over two seasons, using three separate grower lots per experiment. Flavor quality was reduced in 'Owari' following 4 weeks of storage as off-flavor increased, while for 'W. Murcott' the hedonic score decreased after the fruit were stored for 7 weeks. Sensory panelists also noted a decline in tartness during storage for both varieties that was associated with an increase in the ratio of soluble solids concentration (SSC) to titratable acidity (TA). Large increases in alcohols and esters occurred during storage in both varieties, a number of which were present in concentrations in excess of their odor threshold values and are likely contributing to the loss in flavor quality. Thirteen aroma volatiles, consisting mainly of terpenes and aldehydes, declined during storage by up to 73% in 'Owari', only one of which significantly changed in 'W. Murcott'. Although many of these volatiles had aromas characteristic of citrus, their involvement in flavor loss during storage is unclear. 'W. Murcott' stored at 8 °C had slightly superior flavor to fruit stored at either 0 °C or 4 °C, and the better flavor was associated with higher SSC/TA and lesser tartness. Aroma volatiles did not play a role in the temperature effect on flavor as there were no significant differences in volatile concentrations among the three temperatures. There was no effect of storage temperature on the flavor of 'Owari'.