Title Distribution center and retail conditions affect the sensory and compositional quality of bulk and packaged slicing cucumbers

Author M. Cecilia N. Nunes , Jean-Pierre Emond, Sharon Dea and Yavuz Yagiz

Citation Postharvest Biology and Technology, Volume 59, Issue 3, March 2011, Pages 280-288

Keywords *Cucumis sativus* L.; Color; Chilling injury; Weight loss; Chlorophyll

Abstract

During distribution and retail display, fruits and vegetables are often exposed to undesirable temperature and humidity conditions which often result in increased waste due to weight loss and objectionable appearance. Unwaxed fresh-market slicing cucumbers (cv. Calypso) were harvested from a commercial operation and shipped to a distribution center (DC) in Florida. At the DC, 2 d after harvest, cucumbers were sorted and either commercially machine packaged in expanded polystyrene trays covered with a polyvinylchloride film or remained unpackaged for bulk retail display. Cucumbers were transported the next day by truck to a retail store in Gainesville, collected from the store, and stored under optimum (10 °C and 90% RH) or simulated retail display conditions (4 °C or 14 °C and 90–92% RH). Sensory (visual and instrumental color, firmness, shriveling, chilling injury and decay) and compositional quality (pH, titratable acidity, soluble solids and chlorophyll contents) were evaluated initially at the DC and after a 4-d simulated retail display period. Overall, bulk cucumbers were softer, appeared more shriveled, and were more affected by pitting and decay than packaged cucumbers. Bulk cucumbers also appeared lighter green and more yellowish than packaged fruit. Hue angle was less in bulk than in packaged cucumbers, but no consistent differences were observed in the L*, chroma, and hue values between the different temperatures. Small variations in the L*, hue, and chroma values compared to significant losses in chlorophyll content suggest that insufficient chlorophyll degradation occurred to cause major visual color changes. The greater weight loss in bulk cucumbers compared to packaged fruit was associated with accelerated chlorophyll degradation, lower acidity, and lower soluble solids content. Although packaged cucumbers had better visual quality than bulk cucumbers, there was higher RH inside the packages and greater development of decay on packaged fruit. Overall, after the 4-d simulated retail display, the appearance of the cucumbers used in this study was considered to be objectionable due to either yellowing, loss of firmness, shriveling or decay, regardless of the treatment. Results from this study demonstrate the importance of using an appropriate protective package in addition to maintaining the optimum temperature during distribution and retail display. Moreover, initial quality evaluation should be performed upon reception at the DC, and before cucumbers are displayed at the retail store, in order to estimate the remaining shelf life before this product becomes unacceptable for sale.