

Title Relationship between visual appearance and browning as evaluated by image analysis and chemical traits in fresh-cut nectarines

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Abstract

Consumer acceptance of fresh-cut nectarines may be related to several characteristics (freshness, overall browning) that can be measured with suitable sensors. In this paper, digital image analysis was used to assess quality and marketability of fresh-cut nectarines, stored in air for 12 d at 5 °C. Visual appearance and colour were measured using a conventional colorimeter and a computer vision system. In addition, a number of fruit were analyzed for pH, titratable acidity, total soluble solids, total phenols and antioxidant content. During storage, nectarine slices showed a loss in appearance; after 12 d slices which were brown, having lost their freshness, showed a mean 30% decrease in total phenolics and a mean 10% increase in antioxidant activity with respect to fresh slices (13.7 ± 4.3 mg gallic acid 100 g^{-1} f.w. and 53.5 ± 5.2 $\mu\text{mol TE } 100 \text{ g}^{-1}$ f.w.). Visual appearance correlated significantly with the browning score ($R^2 = 0.78$), titratable acidity ($R^2 = 0.45$) and pH ($R^2 = 0.85$). Correlation of the visual appearance score with the colour parameters b^* and chroma measured by the computer vision system was higher ($R^2 = 0.76$) than that obtained using a colorimeter ($R^2 = 0.57$). The results showed that the computer vision system was more effective than the colorimetric method. Measurements by means of the computer vision system resulted in a reliable tool to determine quality and marketability of fresh-cut nectarines in an objective and quantitative way. Moreover, the proposed computer vision system is suitable for real-time application in the food processing industry.