

Abstract

The shelf-life of minimally processed (MP) kiwifruit is principally limited by softening and colour degradation, caused by increased enzymatic activities as a consequence of wounding.

Modified atmosphere packaging (MAP) with non-conventional gas mixtures was tested on the maintenance of some physico-chemical characteristics of MP kiwifruit slices, during refrigerated storage. Kiwifruit slices were sealed in polypropylene boxes that were stored in air (control) and in three different modified atmospheres: N₂ (90%), O₂ (5%), CO₂ (5%); Ar (90%), O₂ (5%), CO₂ (5%) and N₂O (90%), O₂ (5%), CO₂ (5%). The packed kiwifruit samples were stored at 4 °C for 12 days and the following quality parameters were monitored during storage: soluble solids content, weight loss, carbon dioxide and oxygen levels in the package headspace, texture changes and surface colour by a reflectance colorimeter (lightness, hue angle and chroma) and by image analysis (percentage of browning area). MA with 90% of N₂O was the best mixture of tested gases in order to maintain the quality of kiwifruit slices. The initial firmness value of kiwifruit slices (about 13 N) decreased only by 10% after 8 days in the sample packed in N₂O, while about 70% firmness loss was detected in the control sample after just 4 days of refrigerated storage. Kiwifruit slices in N₂O also maintained a better initial colour, in particular in terms of L^* and hue. Moreover, the use of image analysis showed less browning in both the pericarp and core surfaces of the samples in N₂O, compared to the control. Correlation analysis between texture and all colour results showed that the application of an image analysis technique allowed a good recognition of chromatic changes related to fruit softening. Score plots of principal component analysis (PCA) showed slight modifications in the most important discriminated quality factors for the sample in N₂O, a rapid quality loss for samples in air and in N₂ and an acceptable quality maintenance until the 8th day of storage for the sample in Ar.