

Title Application of Kubelka–Munk analysis to the study of translucency in fresh-cut tomato
Author M.M. Lana, M. Hogenkamp and R.B.M. Koehorst
Citation Innovative Food Science & Emerging Technologies, Volume 7, Issue 4, December 2006, Pages 302-308
Keywords *Lycopersicum esculentum*; Tomato fruit; Spectrophotometry; Kubelka–Munk analysis; Water soaking; Wound injury; Minimally processed

Abstract

In order to assess the development of translucency in fresh-cut tomato (*Lycopersicum esculentum* cv. Bellissimo) during refrigerated storage, two experiments were conducted. In the first one, tomato slices obtained from fruits at breaker and at red stage were stored at 5 ± 0.5 °C and monitored at regular intervals for 9 days. In the second one, slices obtained from fruits at the light-red stage were stored at 5 ± 0.5 °C, 9 ± 0.7 °C and 13 ± 0.7 °C for 4 days. Intact (control) fruits were stored at the same conditions and sliced immediately before the evaluations. In both experiments, translucency was assessed using Kubelka–Munk analysis and through visual evaluation using a scale from 0 to 4. The translucency of cut tomato slices increased during storage in both experiments. Fruits at red stage got translucent faster than fruits at breaker stage and the intensity of translucency was also higher for more ripe fruit. The storage temperature did not influence significantly the development of translucency, indicating that the water soaking of the pericarp tissue is not a result of chilling injury. The *K/S* (absorption coefficient/scattering coefficient) ratio increased during storage for cut fruits and remained practically constant for intact fruits, reflecting the effects of treatment observed visually. Additional experiments indicated that the removal of the locular gel combined or not with washing and drying the slice cut surface inhibited the development of translucency.

Industrial relevance

The development of translucency is a common alteration in the appearance of fresh-cut fleshy tissue after processing, which renders the product unappealing for consumption. It is of interest for the fresh-cut industry to be able to assess the development of translucency and then evaluate the effect of different procedures in its occurrence and intensity. This paper presents the use of Kubelka–Munk analysis, a technique of widespread use in other fields like printing and painting, to assess the development of translucency in sliced tomato and to study how this process is affected by storage temperature and maturity stage of the fruit.