

Title Evaluation of shelf-life of fresh-cut pineapple using FT-NIR and FT-IR spectroscopy
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Citation Postharvest Biology and Technology, Volume 54, Issue 2, November 2009, Pages 87-92
Keywords Fresh cut fruit; Pineapple; Shelf-life; NIR spectroscopy; MIR spectroscopy

Abstract

The aim of this work was to investigate the loss of freshness of fresh-cut pineapple samples stored at different temperatures using non-destructive spectroscopic methods. Three lots of fresh cut pineapples (*Ananas comosus* L. cv. *Golden Ripe*, from Costa Rica), packaged in PVC trays (250 g) were analyzed during storage at three different temperatures (5.3, 8.6 and 15.8 °C). Loss of quality of these fruit was evaluated by chemical and microbiological parameters and using NIR and MIR spectroscopy. The FT-NIR spectra were acquired in reflectance mode directly on the slice of fresh-cut pineapple, over the range 12,500–3900 cm⁻¹, while FT-IR spectra were collected over the range 4000–700 cm⁻¹ using an horizontal ATR cell. Some chemical and microbiological parameters were also measured. Principal component analysis (PCA) was applied to the second derivative of the spectra to uncover molecular modifications occurring over the storage time. A clear discrimination between “fresh” and “old” samples was obtained and a stability time corresponding to the time of the initial loss of freshness was defined at each temperature. The stability times revealed by NIR spectroscopy were in good accordance with those evaluated by MIR. At each temperature the stability times (i.e. the initial loss of freshness times) defined by spectroscopic techniques (4–5 d at 5.3 °C, 3–4 d at 8.6 °C and 1 d at 15.8 °C) were associated with a mesophilic bacteria count ranging between 10⁵ and 10⁶ CFU g⁻¹ and lower than the maximum limit for mesophilic bacteria (<5 × 10⁷ CFU g⁻¹) given by French hygienic regulations at consumption.