

Influence of fruit logistics on fresh-cut pineapple (*Ananas comosus* [L.] Merr.) volatiles assessed by HS-SPME–GC–MS analysis

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Abstract

Green-ripe pineapples are shipped overseas by sea freight, while those picked at full maturity need to be transported by airfreight over the same large distance. In this study, fresh-cut pineapple cubes were assessed two, five, and eight days after processing from green-ripe pineapples after mimicked sea freight (SF) and fully ripe air-freighted (AF) pineapples. The sea-freighted samples displayed elevated titratable acidity (TA), thus resulting in smaller ratios of total soluble solids and TA compared to the AF pineapples. Differences in the carotenoid levels of the two fresh-cut categories were found to be insignificant. By contrast, hierarchical cluster analysis (HCA) and principal component analysis (PCA) calculated on the basis of the volatiles analysed by headspace solid-phase microextraction–gas chromatography–mass spectrometry (HS-SPME–GC–MS) permitted to distinguish all six individual sample types and to segregate them into two major clusters (SF and AF). The effect of storage on the volatiles was further evaluated by partial least squares (PLS) regression. Substantial chemical markers to differentiate the individual samples and to describe the effect of storage were deduced from the PCA and PLS regression, respectively. In general, fresh-cut products obtained from fully ripe AF fruit displayed higher concentrations of volatiles, in particular, increased concentrations of diverse methyl esters. With progressing storage duration, the concentrations of ethanol and diverse ethyl esters increased. Moreover, products from AF pineapples displayed lower microbial counts compared to those from SF fruit.