Title Physiology of minimally processed Manila mango slices

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Citation Book of Abstracts, 2004 IFT (Institute of Food Technologists) Annual Meeting and Food Expo, 13-16 July 2004, Las Vegas, Nevada, USA. 321 pages.

Keywords mango; minimally process; physiology

Abstract

Decompartmentation in pre-cut products is responsible for release of cell components that produce enzymatic browning, formation of white material on the surface, texture loss, microbial contamination, nutrient loss and other symptoms of mechanical stress as increased respiration and ethylene production rates. There are no studies of the physiological behavior of pre-cut Manila mangoes, which is a variety widely produced in eastern Mexico. The purpose of this work was to evaluate the compositional and physiological changes that occurred in minimally processed Manila mango slices. Fruit were harvested from a local orchard, sorted, washed and disinfected with 1000 mg/L chlorine solution. Fruit were tempered at 24 °C for 3 d and slices (1x5x4 cm) were prepared aseptically inside a laminar flow hood. Control slices had no further treatments, while treated slices were immersed in solutions of citric acid , calcium chloride, sodium benzoate and hydrogen peroxide). All slices were packed in high density polyethylene bags and stored at 24, 12 or 6 °C. Textural hardness, weight loss, acidity, pH values, color, soluble solids, organic acids and sugars were monitored. Additionally, respiration rate, ethylene production rate, ACC content and ACC oxidase activity were determined. Storage temperature of 6 °C produced the lowest respiration rates in all slices. Sucrose and fructose were produced, as well as citric and malic acids in control as compared to treated slices, in which greater respiration rate and lower sugars and organic acids concentrations were measured that maybe attributed to the additives used, probably more by the peroxide. The treatment also affected color development and ACC oxidase activity. Firmness remained similar in both types of slices that were stored at 6 °C. Slices kept at 12 °C displayed greater concentrations of ascorbic and oxalic acids and glucose. Results suggest that minimally processed slices from Manila mangoes may be prepared and by the use of additives, shelf-life can be extended up to 17 d without major changes of their composition.