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Fresh-cut melon nutritional and functional quality throughout the production processing line and during storage

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Abstract

Fruits processing conditions can be described through representative flowcharts with the identification of the process variables. However, integrated information about the effect of each processing step on phytochemical properties of the processed fruits is still lacking. This study aims at development of a system to audit postharvest handling systems and processing lines for the preservation of health-promoting phytochemicals and to optimize processing conditions to maintain fruit quality. A nutritional and functional audit of postharvest handling systems and processing lines of a fresh-cut fruits enterprise was performed and the effects of the production process upon the nutritional and phytochemical composition of melon were determined. Three replicated samples were collected at each step of the production flowchart of fresh-cut cantaloupe melon: at fruit reception, after washing and decontamination and after processing. All samples were frozen with liquid nitrogen and stored at -80 °C until analyzed for nutritional characterization. Total antioxidant activity was assessed by the ABTS method, total phenolics by Folin Ciocalteau´s method and phenolic compounds and carotenoids were analyzed by high performance liquid chromatography (HPLC-DAD). Throughout cantaloupe melon processing, a significant decrease in total phenolic compounds and antioxidant capacity was observed, while total carotenoids levels were relatively maintained. Contrarily, as processing advanced, ascorbic acid concentration increased significantly after decontamination step. After the nutritional audit to the process and to evaluate nutritional quality during storage, simulating the company´s commercial conditions and product´s shelf-life, fresh-cut cantaloupe samples were placed in polypropylene clamshells (236 mL) or in packages heat sealed with a low oxygen transmission rate film (78 mL) and stored at 5 °C for 6 days. Except for ascorbic acid concentration, which was better maintained in filmed packages, overall nutritional quality of fresh-cut melon is better maintained during storage in clamshell packages.

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