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Physiological and phytochemical quality of ready-to-eat rocket leaves as affected by processing, modified atmosphere and storage temperature

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Abstract

Rocket leaves are widely consumed as a ready-to-eat (RTE) leafy vegetable, valued by its wide range of health promoting phytonutrients, including vitamin C and phenolic compounds. Processing and storage conditions are known to affect quality of RTE rocket leaves, with package atmosphere and low temperature as key factors in quality maintenance throughout processing to consumption. However, information on rocket leaves nutritional quality as affected by modified atmosphere and storage temperature is scarce. In order to generate recommendations to optimize phytochemical preservation of rocket leaves during processing, a nutritional audit of the processing line of a fresh-cut vegetables enterprise was performed. Samples were collected at each step of the production flowchart of RTE rocket-leaves: at rocket leaves reception, after washing and decontamination, after centrifugation and after packaging. All samples were analyzed for nutritional characterization. Furthermore, the effect of modified atmosphere and temperature conditions during storage on physiological and phytochemical quality of RTE rocket leaves was evaluated and the relative changes determined. To study modified atmosphere effects on quality, freshly harvested rocket leaves were processed, packaged in low oxygen permeability film bags, flushed with different oxygen concentrations (2.5; 5; 10 and 20% O_2), thermo sealed with a vacuum packing machine and to analyze the effect of temperature on quality, freshly harvested rocket leaves were processed, packaged and stored at different temperatures (0, 5 and 10 °C) for 14 days. All rocket leaves samples were assessed for respiration rate, chlorophyll content and phytochemical composition during storage. Processing, modified atmosphere and storage temperature significantly affected respiration rate, chlorophyll content and phytochemical composition of RTE rocket leaves. The integration of these results contributes to the understanding of the effects of processing and storage conditions on overall quality of RTE vegetables and provide

useful information for developing processes aimed at the modulation of nutritional quality and shelf-life extension.

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