

Title Impact of decontamination agents and a packaging delay on the respiration rate of fresh-cut produce

Author Isabelle Vandekinderen, Frank Devlieghere, Bruno De Meulenaer, Kim Veramme, Peter Ragaert and John Van Camp

Citation Postharvest Biology and Technology, Volume 49, Issue 2, August 2008, Pages 277-282

Keywords Vegetables; Physiology; EMAP; Modified atmosphere; Disinfection

Abstract

Quality of fresh-cut produce is influenced by both microbiological and physiological processes. Up till now there have been only limited reports dealing with the effect of decontamination on the respiration of lightly processed produce. In this paper water, sodium hypochlorite, neutral electrolysed oxidising water and peroxyacetic acid were evaluated for their effect on the respiration rate of fresh-cut vegetables such as carrot, iceberg lettuce, leek and white cabbage. Respiration rate measurements were done at 7 °C and 3% O₂ by means of the closed method. Following that, the influence of a packaging delay on the respiration rate of water washed and treated (80 mg/L peroxyacetic acid) carrot and white cabbage was examined.

Sodium hypochlorite did not have a significant influence on the respiration rate of carrot, leek and cabbage, but increased that of iceberg lettuce from 0.30 to 0.46 mmol O₂/kg h. Washing leek and iceberg lettuce with peroxyacetic acid did not change the respiration rate, but decreased that of carrot and white cabbage to a level of less than half of its initial value. Apparently the respiration rate of fresh-cut produce with a large area of cut surfaces, was influenced by peroxyacetic acid decontamination. Grated carrots did not show any significant respiration after a treatment with 250 mg/L peroxyacetic acid. A treatment with neutral electrolysed oxidising water containing 30 mg/L free chlorine decreased the respiration of leek and white cabbage whereas with 5 mg/L it reduced the respiration of white cabbage only.

During a packaging delay of 24 or 48 h a sharp increase in respiration of water washed vegetables as well as vegetables treated with peroxyacetic acid was observed. In general, besides the degree of cutting, other processing effects such as the type of sanitizer and the time between processing and packaging can have an influence on the respiration and must be taken into account when an appropriate packaging configuration needs to be designed for a specific commodity.