Title The implementation of a decontamination step during the processing of fresh-cut produce: A compromise between inactivation efficiency and quality aspects

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Citation Abstracts Book, 6th International Postharvest symposium, 8-12 April 2009, Antalya, Turkey. 256 pages.

Keyword Vegetable; process; quality

Abstract

Given the consumer's demand for fresh, healthy and ready-to-eat foods, the market for products such as minimally processed vegetables is increasing tremendously. These products are known to be vulnerable to the contamination and subsequent survival and/or growth of micro-organisms resulting in both safety concerns and relatively short shelf lives. Consequently, a decontamination step is frequently applied in their production process to enhance their safety and to prolong their shelf life by moving both pathogenic and spoilage micro-organisms. Next to the conventionally used sodium hypochlorite, alternative decontamination agents such as chlorine dioxide, peroxyacetic acid and electrolyzed oxidizing water were introduced into the food industry. The efficiency of these sanitizers to inactivate the microbial load of fresh-cut vegetables will be presented. On the other hand the intake of vegetables is essential since they are important sources of bioactive compounds such as vitamins, pro-vitamins and secondary plant metabolites, which are related with beneficial effects on human health. Since most of the disinfectants have high oxidizing properties, they will possibly react with the antioxidants present in vegetables and will induce negative changes in the sensory attributes like taste, colour and texture. Therefore, the influence of the previously mentioned decontamination agents was studied on the nutrient content (vitamin C, carotenoids, tocopherols, total phenols, antioxidant capacity) and sensory quality of different fresh-cut vegetables. With regard to physiology, the influence of using a decontamination agent on the respiration rate was evaluated. Considerable reductions of the respiration rate of cabbage and carrot were found after a treatment with peroxyacetic acid, whereas other agents did not change the respiration rate significantly. In a last phase, storage experiments were conducted to evaluate the effect of a decontamination step on the evolution during time of microbial parameters, organoleptic properties as well as nutrient content.