

**Title** The effect of the decontamination process on the microbial and nutritional quality of fresh-cut vegetables

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### **Abstract**

The last decade consumers demand fresh, healthier convenience-type of foods such as fresh-cut vegetables. As fresh vegetables have a relatively high initial microbial load, a decontamination step is frequently applied during their production process to enhance the safety and to prolong the shelf life of these products. Recently new decontamination agents such as chlorine dioxide, peroxyacetic acid and electrolysed oxidising water were investigated for applications into the food industry. In this paper the state-of-the art about the effectiveness of these agents to remove the initial microbial load has been reviewed. Furthermore the review is completed with research results. Gaseous chlorine dioxide and peroxyacetic acid gave the most promising results. By using  $2.0 \text{ mg L}^{-1}$  of gaseous chlorine dioxide or  $80 \text{ mg L}^{-1}$  peroxyacetic acid, microbial reductions of  $2.3 \text{ log cfu/g}$  and  $1.7 \text{ log cfu/g}$ , respectively, were obtained in fresh-cut white cabbage. The intake of vegetables is also essential for a healthy diet since they are important sources of vitamins, provitamins and secondary plant metabolites. These bioactive compounds have an antioxidant function in the human body and their intake can be related to the prevention of several diseases. The effect of the previous mentioned peroxyacetic acid was studied on the total vitamin C content in fresh-cut white cabbage. Furthermore the effect of a chlorine treatment on the carotenoid content of fresh-cut carrot was evaluated. Rinsing the fresh-cut vegetables with water already causes a loss of total vitamin C of about 20%. In some cases an additional degradation of vitamin C, caused by the oxidative capacity of the sanitizer was observed. The effect of a chlorine treatment on the carotenoid content of fresh-cut carrot was rather limited.