Title Shelf-life of minimally processed cabbage treated with neutral electrolysed oxidising water and stored under equilibrium modified atmosphere

Author Vicente M. Gómez-López, Peter Ragaert, Jaak Ryckeboer, Visvalingam Jeyachchandran, Johan Debevere and Frank Devlieghere

Citation International Journal of Food Microbiology, Volume 117, Issue 1, 10 June 2007, Pages 91-98

Keywords Electrolyzed oxidising water; Minimally processing; Fresh-cut; Modified atmosphere; Decontamination; Shelf-life; White cabbage

Abstract

Minimally processed vegetables (MPV) have a short shelf-life. Neutral electrolysed oxidising water (NEW) is a novel decontamination method. The objective of this study was to test the potential of NEW to extend the shelf-life of a MPV, namely shredded cabbage. Samples of shredded cabbage were immersed in NEW containing 40 mg/L of free chlorine or tap water (control) up to 5 min, and then stored under equilibrium modified atmosphere at 4 °C and 7 °C. Proliferation of aerobic mesophilic bacteria, psychrotrophic bacteria, lactic acid bacteria and yeasts were studied during the shelf-life. Also pH and sensorial quality of the samples as well as O_2 and CO_2 composition of the headspace of the bags was evaluated. From the microbial groups, only psychrotrophic counts decreased significantly ($P < 0.05$) due to the effect of NEW, but the counts in treated samples and controls were similar after 3 days of storage at 4 °C and 7 °C. Packaging configurations kept O_2 concentration around 5% and prevented CO_2 accumulation. pH increased from 6.1–6.2 to 6.4 during the shelf-life. No microbial parameter reached unacceptable counts after 14 days at 4 °C and 8 days of storage at 7 °C. The shelf-life of controls stored at 4 °C was limited to 9 days by overall visual quality (OVQ), while samples treated with NEW remained acceptable during the 14 days of the experiment. The shelf-life of controls stored at 7 °C was limited to 6 days by OVQ and browning, while that of samples treated with NEW were limited to 9 days by OVQ, browning and dryness. According to these results, a shelf-life extension of at least 5 days and 3 days in samples stored respectively at 4 °C and 7 °C can be achieved by treating shredded cabbage with NEW. NEW seems to be a promising method to prolong the shelf-life of MPV.