

Title Evaluation of a pre-cut heat treatment as an alternative to chlorine in minimally processed shredded carrot

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Abstract

The effect of a pre-cut heat treatment (100 °C/45 s) as an alternative decontamination treatment to chlorinated-water (200 ppm active chlorine/1 min, 5 °C) was evaluated in minimally processed carrot (shredded). The quality of shredded carrots was studied just after minimal processing and during storage at 5 °C (10 days) by evaluating microbial (total mesophilic aerobic, yeast and moulds and lactic acidbacteria counts), physical–chemical (soluble solids content, pH, titratable acidity, whiteness index), physiological (peroxidase activity and headspace analysis) and sensorial attributes (colour, fresh-like appearance, aroma and general acceptance). The relationships between sensory perception of undesired changes, microbial contamination threshold, physico-chemical and physiological indices were investigated and compared between heat-treated and control samples. The use of heat in pre-cut carrot proved to be more efficient than chlorinated-water concerning microbial control (threshold concentration of 7 Log₁₀ cfu g⁻¹), providing an acceptable fresh-like quality product during 10 days of storage (5 °C), which corresponds to a 3-day shelf-life extension compared to control samples. Heat-treated shredded carrot showed lower respiratory and POD activities than chlorinated samples suggesting that the use of heat provides a metabolic activity lowering effect besides the microbial effect which could be important to shelf-life extension of the fresh-cut product.