

Title Hydrogen peroxide effects on the quality of chilled carrot
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Citation Abstracts of 27th International Horticultural Congress & Exhibition (IHC 2006), August 13-19, 2006, COEX (Convention & Exhibition), Seoul, Korea. 494 pages.
Keywords hydrogen peroxide; modified atmosphere packaging; bacterial load reduction; chilled carrot

Abstract

To determine the bacteriolytic effect of H₂O₂ three microorganisms, isolated from carrots (MC) as well as *Escherichia coli*, *Erwinia carotovora*, *Salmonella* CECT 443 and *S. typhimurium*, were prepared in 0.1% peptone water (PW) containing 0, 0.5, 1, 2 and 5% H₂O₂ to obtain suspensions of about 10⁸ and 10¹⁰ cfu mL. After 4 h of chilled exposure at 0.5% H₂O₂ the number of viable cells in bacterial suspensions was reduced by 1 logarithmic unit, which represents a 90% reduction. Since viable cells were not detected in the decimal dilutions analyzed (3rd-5th) when 2 and 5% H₂O₂ were used, the chemical at these concentrations seems to kill >99% of the bacterial population after the first 4h of exposure. To check if cell lyses is involved in the inhibitory effect of H₂O₂ cells of MC and *Salmonella* were incubated for 24 h at 4°C, 30°C and 37°C in PW containing 2% of the chemical. Significant changes in optical density (O.D.) were not observed in these conditions, which suggests that the bactericidal action of the H₂O₂ does not involve cell lyses. The effect of treatment with 1% and 2% H₂O₂ on the quality of carrots stored at +0.5°C, were observed with respect to color (external, internal and puree), soluble solids, total solids, pH, titratable acidity, total phenolics and carotenoid total (mg b-carotene g⁻¹). Polymeric films used in the packaging were of two different types: oriented 35mm polypropylene (OPP), of high permeability (ca. 240,000 ml O₂ m² day⁻¹ atm⁻¹ at 25°C) and polyethylene (PE) of 30mm thickness. H₂O₂ (>0.5% for 4 hours) is capable of achieving >90% reduction of viable cells in suspension of microorganisms isolated from carrot, and consequently it seems to be bactericidal, while cell lyses does not appear to be involved in the inhibitory effect. Highest quality corresponds to the sliced carrot treated with 2% H₂O₂ and those packed in OPP film gave the best natural color.