

Title Hydrogen ion concentration affects quality retention and modifies the effect of calcium additives on fresh-cut 'Rocha' pear

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Abstract

'Rocha' pear (*Pyrus communis* L.) was used as a model system to assess the effect of pH of dipping solutions on quality retention of fresh-cut fruit and its interaction with calcium additives. Pear slices were dipped for 60 s in a buffer solution at pH 3.0, 5.0 or 7.0 and stored at 4.5 °C for 13 days. In other experiments, pear slices were dipped for 60 s in buffer solutions containing 250 mM of calcium ascorbate, lactate, chloride, and propionate, at pH 3.0 or 7.0, and stored at 4.5 °C for 6 days. Browning and softening were more intense in slices dipped in a solution at pH 3.0 than at pH 5.0 or 7.0, but microbial growth was lower in slices treated at pH 3.0. The effect of calcium additives depended on the anion and significant interactions between the effects of calcium salt and pH were observed. Calcium ascorbate was very effective in preserving color and reducing microbial growth irrespective of pH, but enhanced pectin solubilization and tissue softening at pH 3.0. Slices treated with 250 mM calcium propionate or calcium lactate were softer and had higher electrolyte efflux when treated at pH 3.0 than at pH 7.0. Calcium lactate enhanced browning and reduced microbial growth at pH 3.0 but did not affect color or microbial counts at pH 7.0. All calcium treatments enhanced electrolyte leakage. pH of the dipping solution can affect, *per se*, the quality of fresh-cut fruit. The choice of calcium additives to prevent undesirable changes on visual and sensory quality of cut produce should involve pH ranges that provide the expected benefits.