

Title Effect of calcium lactate and heat-shock on texture in fresh-cut lettuce during storage
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Abstract

Textural and microstructural changes in fresh-cut lettuce were analysed over 12 days storage. The vegetable was treated with 120 ppm chlorine and with 15 g/L calcium lactate at room temperature ($\sim 18\text{--}20\text{ }^{\circ}\text{C}$) and at $50\text{ }^{\circ}\text{C}$ (heat-shock). Texturometer analysis showed that samples washed with calcium lactate had significantly ($p > 0.05$) higher crispness values than samples washed with chlorine. However the use of $50\text{ }^{\circ}\text{C}$ treatment (heat-shock) gave better textural properties at the end of storage and significantly retarded the softening process, being in agreement with the sensorial results. Cryo-SEM micrographs showed a loss of turgor (shrinkage) of the tissue cells in the samples washed with chlorine, effect not so evident in calcium lactate treated samples. The use of heat-shock in combination with calcium lactate reduced this phenomenon better than the other two treatments. Pectin methyl esterase (PME), enzyme related to textural changes, showed higher activity in samples treated with calcium lactate at $50\text{ }^{\circ}\text{C}$. The combination of calcium lactate and $50\text{ }^{\circ}\text{C}$ washing temperature maintained objective and sensorial textural properties of fresh-cut lettuce better than the calcium lactate or chlorine washing treatments at room temperature.