

Title Effect of ultrasound on the mass transfer and physical changes in brine bell pepper at different temperatures

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Abstract

Mass transfer and physical attributes of red bell pepper were evaluated. Pepper strips were placed into brine of constant concentration at different temperatures (25–55 °C) with immersion times ranging from 15 to 480 min with and without ultrasound treatment. Diffusion coefficients were evaluated for calcium, sodium, citric acid, soluble and total solids, impregnation and water loss. Firmness, kinetic coefficients and color were determined for each treatment. Ultrasound increased the uptake of solutes ($p < 0.05$) with the exception of calcium, sodium ions, and acidity, where diffusion coefficients did not significantly differ among treatments. Loss of water, total and soluble solids in tissue significantly increased at 55 °C with 47 kHz, with diffusion coefficients of $13.23 \times 10^{-10} \text{ m}^2/\text{s}$, $7.26 \times 10^{-10} \text{ m}^2/\text{s}$ and $14.42 \times 10^{-10} \text{ m}^2/\text{s}$, respectively. These increases may be attributed to increased cell wall permeability, facilitating transport of water and solute, as evidenced by product firmness, where ultrasound treatments had a negative effect on firmness.