

Title Effects of high pressure argon treatments on the quality of fresh-cut apples at cold storage

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Abstract

High pressure (HP) argon (Ar) processing that makes argon and water molecules form clathrate hydrates to restrict intracellular water activity and enzymatic reactions. This can be used in the preservation of fruits and vegetables. Effects of HP (150 MPa) Ar treatments on preserving fresh-cut apples were investigated at 4 °C for two weeks. Respiration rate and ethylene production of fresh-cut apples treated by the HP (150 MPa) Ar for 10 min were lower apparently in comparison with those untreated and treated by flushing with Ar and the HP air for 10 min. The HP Ar treatment delayed browning and microbial growth of fresh-cut apples at cold storage, because the populations of both mesophiles and psychrotrophs did not exceed 6.0 log cfu/g, and those for molds and yeasts were less than 3.0 log cfu/g after two weeks storage. HP Ar treatment did not affect the content of titrated acidity and soluble solids, and significantly reduced the total phenolics decrease in fresh-cut apples ($p < 0.05$). Dipping into chemical solution, such as 0.5% ascorbic acid (AA), 0.5% citric acid (CA) and 0.5% calcium chloride (CC) for 5 min could reduce the changes in the color and firmness of apple wedges during HP operation, and the combined HP Ar with dipping treatment remained good sensory attributes of fresh-cut apples for 12 days at 4 °C. These results indicated the HP Ar treatment could be an effective method for improving the quality of fresh-cut apples at cold storage conditions.