

Title Browning inhibition and shelf life extension of fresh-cut Chinese water chestnut by short N₂ treatments
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Abstract

Fresh-cut Chinese water chestnut (CWC) can meet the ever-increasing demands of consumers for high quality, fresh, nutritive, and conveniently prepared foods. Surface browning was the major factor limiting the shelf life of fresh-cut CWC. Experiments were conducted to examine effects of short-term N₂ gas treatments on shelf life extension and quality maintenance of fresh-cut CWC, as an alternative to sulphite treatment. Chinese water chestnuts were washed, peeled and cut into 5-mm thick slices (6 pieces per fruit), dipped in a 0.1% (w/v) NaClO solution for 1 min, air-dried for 30 min and then exposed to N₂ for 0, 2, 4 or 8 h. After N₂ treatments, the slices were placed into trays over-wrapped by plastic films and then stored at 4°C. Changes in surface discoloration, eating quality and disease development were evaluated. Exposure of fresh-cut CWC to N₂ gas for 2 h significantly reduced the surface browning, inhibited the disease development, maintained the eating quality and membrane integrity and reduced the loss in the concentrations of total titratable acidity and total soluble solid. The results suggested that a pre-storage N₂ treatment for 2 or 4 h was an effective means of extending the shelf life of fresh-cut CWC.