

Title Applicability of vacuum-dehydrofreezing technique for the long-term preservation of fresh-cut eggplant: Effects of process conditions on the quality attributes of the samples

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Citation Journal of Food Engineering, Volume 91, Issue 4, April 2009, Pages 560-565

Keywords Vacuum-dehydrofreezing; Physical properties; Quality; Electrical impedance spectroscopy; Eggplant

Abstract

This paper discusses the application of vacuum-dehydrofreezing technique to long-term storage of fresh-cut eggplant. Vacuum-dehydrated eggplant samples (target moisture content: 80% and 60%, w.b.) were subjected to successive freezing, thawing and rehydration treatments under various process conditions; the physical properties including surface color, texture and electrical impedance of the processed samples were investigated and compared to those of the conventionally frozen–thawed samples. Results showed that the freezing time of the dehydrated samples shortened apparently with the decreasing moisture content; the rate of immersion freezing was obviously higher than that of the air freezing. After the dehydration–freezing–rehydration treatment, the surface color and texture of the samples improved markedly over the non-dehydrated samples. The combination of immersion freezing and low temperature thawing (5°C) had the least impact on the texture of the samples among the examined experimental conditions. Electrical impedance spectroscopy analysis indicated that the damage to the cell structures caused by ice formation during freezing led to the fundamental changes of the quality attributes.