

Title Optimization of an equilibrium modified atmosphere packaging (EMAP) for minimally processed mandarin segments

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Abstract

In view of the increasing demand for products with a fresh-like quality that are convenient to consume, the purpose of this research was to develop a ready-to-eat mandarin segments product. Mandarin segments were stored in controlled atmosphere environments with varying compositions at 3 °C. The results observed for different freshness indicators, especially the accumulation of acetaldehyde and ethanol and the sensory test scores, revealed that an atmosphere with low carbon dioxide concentration (3%) is suitable for this product. A mathematical model which considers the respiration rate and the gas mass transfer through plastics was used to make a pre-selection of suitable packages. Due to the high respiration rate of mandarin segments, the model showed the need of using microperforated plastic films to design the modified atmosphere package. The number of micropores was optimized by monitoring the accumulation of fermentative volatile compounds for three weeks at 3 °C. The results confirmed by a sensory test indicated that the optimum equilibrium modified atmosphere packaging for mandarin segments was 19.8/1.2% (O₂/CO₂%).