

Title Modeling changes of headspace gas concentrations to describe the respiration of fresh-cut melon under low or superatmospheric oxygen atmospheres

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Abstract

Packages of fresh-cut 'Piel de Sapo' melon were stored under 2.5 kPa O₂ + 7 kPa CO₂, 21 kPa O₂, and 70 kPa O₂ atmospheres for 35 days at 4 °C. A mathematical procedure was tested to model changes of in-package O₂ and CO₂ concentrations throughout storage, in order to predict the respiratory activity of the commodity. The relationships between respiratory activity and quality parameters of fresh-cut 'Piel de Sapo' melon were also assessed. A 70 kPa O₂ atmosphere reduced CO₂ production rate during 14 days, as well as prevented ethanol production during 3 weeks of storage. On the other hand, fermentative pathways were triggered under a 2.5 kPa O₂ + 7 kPa CO₂ atmosphere. Although 70 kPa O₂ levels involved a high O₂ consumption and a decrease in the soluble solids content, the use of superatmospheric O₂ atmospheres are proposed to reduce CO₂ production rates, avoid fermentative reactions and, maintain firmness and chewiness of fresh-cut 'Piel de Sapo' melon for 2 weeks of storage.