

Title Modelling respiration of fresh produce at superatmospheric oxygen and carbon dioxide partial pressures: general approach and case study for strawberry and fresh-cut butterhead lettuce

Author S. Geysen, B.E. Verlinden, V.H. Escalona, A. Conesa and B.M. Nicolai

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Abstract

The effect of oxygen (low and superatmospheric partial pressures), carbon dioxide and temperature on the respiration rate of strawberries (*Fragaria x ananassa* Duchesne ex Rozier) and fresh-cut butterhead lettuce (*Lactuca sativa* L. var. *capitata* L.), was evaluated. The products were stored in glass jars at three different temperatures. The jars were flushed with humidified gas mixtures containing different levels of carbon dioxide and oxygen. Temperature, carbon dioxide and oxygen partial pressures significantly influenced the respiration rate of both products. A model based on Michaelis-Menten kinetics to describe the respiration rates was constructed. The influence of temperature was described using an Arrhenius equation and carbon dioxide was considered as a non-competitive inhibitor of the respiration. The inhibiting effect of superatmospheric oxygen partial pressures was described by a non-competitive inhibition term.