

Title Superatmospheric oxygen condition combined with carbon dioxide levels affect the respiration rate of fresh-cut butter lettuce

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Abstract

The effect of different O₂ levels from 0 to 100 kPa in combination with 0, 10 and 20 kPa CO₂ on the respiration metabolism of greenhouse grown fresh-cut butterhead lettuce (*Lactuca sativa* L. var. *capitata* L.) was studied. Fresh-cut lettuce was stored during 3 - 4 days at 1, 5, and 9°C. Fresh-cut lettuce exposed to 20 to 100 kPa O₂ combined with 0, 10 and 20 kPa CO₂ showed a CO₂ production rate of 40 to 60 nmol kg⁻¹ s⁻¹ at 1°C. When lettuce was exposed to 2 to 5 kPa O₂ in combination with 10 to 20 kPa CO₂, it had significantly increased CO₂ production relative to 0 kPa CO₂. O₂ partial pressures between 5 and 100 kPa had only a small effect on the respiratory activity of fresh-cut lettuce. Moderate CO₂ level (10 kPa) could reduce the oxygen consumption rate of fresh-cut lettuce. This effect was more pronounced at higher temperatures. High CO₂ levels (20 kPa) probably caused a metabolic disorder increasing the respiration rate of fresh-cut butter lettuce. The respiratory quotient ranged between 0.7 and 1.0 at O₂ partial pressures from 20 to 100 kPa at all temperatures.