

**Title** Controlled atmosphere effects on sugar content and respiratory activity of green celery  
**Author** P. Gómez, F. Artés-Hernández and F. Artés  
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### Abstract

Green celery stalks could be stored at 0 to 4°C and about 95% RH in air for between 2 to 6 weeks. In those conditions undesirable quality changes reducing shelf life occur, and controlled atmosphere (CA) has been shown as useful for lowering those processes. Celery is an important source of mannitol, an uncommon sugar for vegetables and useful for pharmaceutical industries. Moreover, celery sugars, especially mannitol, may be used as a reduced-calorie sweetener. As far as we know there are no reports about the effect of CA on the main sugars present in celery. Horticulturally mature 'Trinova' celery stalks, free from defects and of uniform size were washed with chlorinated water, drained and stored in hermetic glass jars at 4°C during 35 days. Continuous humidified flows through air (as control), 5 kPa O<sub>2</sub> + 5 kPa CO<sub>2</sub> (CA5), 5 kPa O<sub>2</sub> + 15 kPa CO<sub>2</sub> (CA15) or 5 kPa O<sub>2</sub> + 25 kPa CO<sub>2</sub> (CA25) were applied. Throughout cold storage the respiration rate was monitored by using a closed system. At the beginning of the experiment and at the end of cold storage sugar content was measured by liquid chromatography with a refractive index detector. The respiration rate was high at the beginning of storage, decreasing rapidly and being stable until the end. Compared to air, CA storage reduced respiratory activity. The reduction was mainly related to O<sub>2</sub> level, and with almost no impact of varying CO<sub>2</sub>, with no differences among CA treatments. Mannose was the predominant sugar followed by fructose and glucose. After storage, total sugar content decreased for air but not for CA5 and CA15, probably related to lower respiration rate which would retard loss of sugar. Fructose decreased for CA25 and non significant changes were detected for remaining sugars in any CA treatment. After 5 weeks of cold storage, a CO<sub>2</sub> level of 25 kPa was detrimental to sugar maintenance, and CA5 and CA15 provided the best results.