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Condensation and Moisture Regulation in Packaged Fresh-cut Iceberg Lettuce

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Abstract

The aim of this work was to understand the transpiration rate of fresh-cut iceberg lettuce and select appropriate packaging material for regulating moisture and minimising condensation inside the package. Experiments were conducted by conditioning the sample at 2, 6 and 10°C and 76, 86, 96 and 100% RH. TR was recorded during 7 days of storage. Packaging design optimization (with a cellulose-based film window on polymeric film) was performed using TR predicted at temperature of 6°C and 98 and 99% of RH, respectively, in order to establish the desired WVTR of packaging materials. TR ranged from 0.04 to 2.36 g kg⁻¹ h⁻¹ over all the combinations of temperature and RH tested. Based on package design optimization both pure materials (polymer or cellulose-based) didn't satisfy WVTR requirement for fresh-cut iceberg lettuce. Among combined packages, the use of a surface ratio between 5% and 15% could prevent moisture condensation inside the package. Results from validation experiment confirmed the goodness of the package design procedure and showed that the package film with 15% of cellulose film window area on polymeric film was the only one that prevent water vapour condensation inside the package and avoid an excessive weight loss.

Keywords: fresh-cut produce; transpiration rate; modelling; packaging design.

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