

**Title** Sensitivity of Produce Respiration Models used in the MAP-DESIGN Software on the Shelf life Simulation of Broccoli in the Modified Atmosphere Package

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### **Abstract**

Optimization for the designing of modified atmosphere packaging (MAP) for Broccoli was made by the MAPDESIGN software (author's own code). The software is capable of dealing with all parameters required for the designing of MAP for fresh produces, namely packaging materials, package dimensions, storage conditions, and plant respiratory models. Computational algorithms were carefully designed based upon widely use theories of living plant respiration and gas permeability through packaging film and heat transfer. Here, the effect of respiration models on the variation of shelf life estimation is evaluated by using broccoli as the product sample. The purpose was for testing the sensitivity of the choice of respiration models, which were incorporated in the computational codes, having on the accuracy of shelf life estimation. Various packaging materials, package sizes, and storage conditions in term of temperature and humidity were simulated to obtain the product shelf life. A validity of shelf life was tested against the known experimental data of broccoli shelf life in a selected MAP.