

Title Validation of predictive growth models describing superatmospheric oxygen effects on *Pseudomonas fluorescens* and *Listeria innocua* on fresh-cut lettuce

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Abstract

Two microbial growth models predicting the growth of *Pseudomonas fluorescens* and *Listeria innocua* at superatmospheric oxygen and carbon dioxide concentrations at 7 °C were validated on fresh-cut butterhead lettuce. Cut lettuce was inoculated with the same strain of *L. innocua* as the in vitro experiments. The *P. fluorescens* strain was tagged with a gene encoding green fluorescent protein (GFP) in order to distinguish the inoculated strain from contaminating *Pseudomonaceae*. Also growth of aerobic mesophilic and lactic acid bacteria was monitored during the experiments. The suggested *P. fluorescens* model was appropriate to predict growth on cut lettuce. *L. innocua* on the other hand, grew considerably slower under in vivo circumstances than predicted. CO₂ had a growth promoting effect on *L. innocua* growing on cut lettuce, whereas in vitro an inhibiting effect was observed. Validation parameters are calculated and hypotheses to explain the discrepancy between predicted and observed growth of *L. innocua* are provided.