

Abstract:

High oxygen atmospheres (> 70 %) can be used as an alternative for the nowadays applied low O₂/elevated CO₂ modified atmosphere, to prolong shelf life of respiring fresh-cut vegetables and fruit. The effect of high oxygen atmosphere, applied alone or in combination with elevated CO₂ concentrations, on the growth of spoilage micro-organisms (14 species) and pathogens (*Listeria monocytogenes* and *Aeromonas caviae* (HG4)), isolated from fresh-cut produce, has been studied. Of each species only one strain was considered, except for *Candida lambica*, from which 5 different strains were analyzed to check possible differences in sensitivity for high O₂ concentrations between strains of the same species. Lag phase (λ), maximum specific growth rate (μ_{max}), initial count (N₀) and maximum count (N_{max}) were determined applying the Baranyi model. The maximum specific growth rate of G- spoilage bacteria was slightly reduced by high O₂. Growth rate of the two tested pathogens was rather stimulated by high O₂. Lactic acid bacteria were much more sensitive to high O₂ concentrations, but no additive or synergistic effect was found when high O₂ was combined with high CO₂. In most of the cases, growth of yeast strains was strongly inhibited by high O₂, and this effect was even more pronounced when applying 80 % O₂ + 20 % CO₂ (additive effect). Only one strain of *Candida lambica* was not at all affected by high O₂ concentrations and/or elevated CO₂. Growth of *Candida humicola* and of another strain of *Candida lambica* was significantly stimulated by high O₂. So although yeast are generally inhibited during storage experiments with fresh-cut produce under high O₂ atmosphere, this inhibitory effect is not true for every individual yeast strain in in vitro experiments.