

Title Active modified atmosphere packaging of fresh endives: Modelling gas transfer and studying effect on quality changes

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Abstract

Modified atmosphere packaging (MAP) has proven to be capable of extending the shelf-life of fresh fruits and vegetables, notably by reducing the oxygen level and elevating CO₂. According to the literature, modified atmosphere composed of 3–4% of oxygen and 4–5% of carbon dioxide ensures good endive quality preservation. This study focused on active MA packages containing an individual oxygen scavenger sachet and endives packaged in a low-density polyethylene pouch. The design of active MAP for vegetables was studied by developing and validating a new mathematical model predicting atmosphere composition. This work showed that oxygen scavengers reduce by half the transient period duration without modifying gas equilibrium composition compared to passive MAP. The atmosphere composition influence on endive quality was also studied. Both active and passive MAP reduced the total aerobic mesophile growth of endives compared with packaging under ambient air. Moreover, the greening of the leaves and the browning of the basal parts of endives were slightly delayed in passive MAP and markedly inhibited in active MAP.