

Title Combined effects of gaseous O₃ and modified atmosphere packaging on quality and shelf-life of fresh-cut red bell pepper

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Abstract

Bell peppers demand and consumption have increased in recent years, especially for use as an ingredient of ready-to-eat meals. Fresh-cut red peppers were treated with 0.7 ppm ozone for 1, 3 and 5 min. Untreated fruit were used as a control. Pepper strips were packaged in polypropylene trays in air and stored at 10°C for 14 d. Mass loss, gas composition, pH and firmness were evaluated and microbial analyses were performed. Colour was measured before and immediately after O₃ treatment and at the end of the storage period. No differences were observed between control and ozonated samples for the physicochemical parameters, except colour. Mass loss was negligible during storage. O₂ concentration decreased and CO₂ increased continuously, mainly on day 14, associated with fungal development. By day 14, pH increased and a significant softening was observed in all fruit. Regardless of O₃ exposure time, no differences in sample colour were found before and after the treatment. Even more, O₃ did not cause surface discoloration or damage to the peppers. However, °hue and chroma values were lower in these samples with respect to control. After 14 d of storage, lower values of L and an increase in °hue and chroma were observed in all fruit. The initial counts of aerobic mesophilic bacteria were similar for all the treatments. However by day 14, regardless of the exposure time to O₃, a reduction of approx. 2.56 log units was observed for treated samples. On every evaluation date, an important reduction in the counts was observed for psychrotrophic bacteria and also for yeasts and moulds. Our results indicated that O₃ combined with modified atmosphere could reduce microbial counts and extend the shelf-life of minimally processed red bell peppers.