

Title Storage quality of strawberry as influenced by modified atmosphere packaging
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Abstract

Modified atmosphere packaging of respiring produce has come into substantial use in practice though, some potential problems with regard to product quality and safety remain to be solved. Frequently, O₂ is completely depleted, resulting in the production of off-flavors and rapid deterioration of the product. In addition, excessive levels of CO₂ cause specific disorders such as the development of brown stains. Concerning product safety, growth of psychrotrophic pathogens may be enhanced in certain cases because of suppression of the natural flora. Thus, to overcome these problems, superatmosphere O₂ packaging has been recently tried on fresh commodities. High O₂ atmospheres have proved to be particularly effective at inhibiting enzymatic discoloration, preventing anaerobic fermentation, and retarding microbial growth. In this study, storage quality of strawberry packaged under modified atmospheres was investigated to examine the effect of high O₂ and CO₂ on the fruit. Fresh sound strawberry was packed into PP trays and top-sealed with PET/PP film. Initial gas compositions inside the trays were varied with air, 20% O₂/10% CO₂/70% N₂, and 80% O₂/20% N₂. Sealed packaging with PE film and ventilatory PVC trays were also used as treatments. Quality parameters were measured during storage at 5°C for 12 days. Fruit packaged under high CO₂ showed the firmest texture and lowest viable cell counts among all treatment samples, although they suffered from tanned appearance and severe off-flavors. The elevated O₂ significantly delayed fungi development and maintained initial pH, titratable acidity, and flavors. However, the superatmosphere O₂ exhibited lower sensory scores than the high CO₂ and air at the end of storage due to soft rot occurrence. Other quality parameters did not significantly differ between packaging treatments. Results suggest that appropriate combinations of high O₂ and CO₂ can be used as a promising packaging treatment for improving the storage stability of fresh strawberry.