

Title Changes in strawberry phenolics, anthocyanins, and antioxidant capacity in response to high oxygen treatments

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Citation LWT - Food Science and Technology, Volume 40, Issue 1, January 2007, Pages 49-57

Keywords Strawberry; High-oxygen atmospheres; Antioxidant; Phenolics; Anthocyanins

Abstract

Changes in fruit quality, decay, phenolic and anthocyanin content, and antioxidant capacity of strawberries (*Fragaria × ananassa* Duch. cv. Allstar) stored under air and high oxygen atmospheres at 5 °C were investigated. Freshly harvested strawberries were placed in jars and ventilated continuously with air or with 40, 60, 80, or 100 kPa O₂ at 5 °C for up to 14 days. Samples were taken initially, and after 3, 7, 10 and 14 days of storage. While fruit quality parameters such as titratable acidity, total soluble solids and surface color were only slightly affected by differing levels of O₂, the higher oxygen concentration treatments significantly reduced decay. Oxygen concentrations higher than 60 kPa also promoted increases in ORAC values, total phenolics and total anthocyanins as well as individual phenolic compounds analysed by HPLC during the initial 7 days of storage. However, this effect diminished with prolonged storage. No significant differences in ORAC values, total phenolics, total anthocyanins, or the individual phenolic compounds were observed among the high O₂ and air-stored fruits after 14 days of storage. These results indicate that high oxygen treatments exert the most effects on fruit quality and antioxidant capacity of strawberry fruit in the first 7 days of storage.

Abbreviations: AAPH, 2', 2'-azobis(2-amidinopropane) dihydrochloride; CA, controlled atmosphere; ORAC, oxygen radical absorbance capacity; R-PE, (R)-phycoerythrin; Trolox, 6-hydroxy-2, 5, 7, 8-tetramethylchroman-2-carboxylic acid; TE, Trolox equivalents