

Title Effects of postharvest treatment on physical quality, antioxidant composition and activity of strawberry fruit

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Abstract

The effects of storage temperature and carbon dioxide concentration in the storage atmosphere on physical quality and on the level of antioxidants and phytonutrients of strawberry fruit have been studied. Red ripe fruit were stored at 0.5, 10, and 20°C with 75, 85 or 95% relative humidity (RH) for 4 days, and white tip and red ripe fruit were stored at 3 and 10°C with 65 and 95% RH for 12 days. The ideal storage temperatures for maintaining overall quality, color, and firmness, are near 0°C but the acceptable quality of strawberries may be maintained at moderate temperatures such as 10°C for a short term storage period of 4 days. However, the RH must be maintained low enough to avoid fungal decay incidence. Less mature fruit contained higher total flavonoids and phenolic compounds, and activity and these compounds were well maintained even 10°C for 9 days. Total anthocyanin concentration was higher at red ripe fruit than at white tip fruit. Total anthocyanin and total ascorbic acid concentration of white tip fruit increased during the storage at 10°C.

The fineness of 'Northeast' and 'Earliglow' strawberry fruit stored air or in 20% CO₂ (in air) at 3°C was slightly higher compared with those stored in air during the storage. Total ascorbic acids, anthocyanins and flavonoids, and total antioxidant activity of both cultivars were higher in air-stored than CO₂-stored fruit. The total phenolic concentration was lower in CO₂-stored 'Earliglow' fruit than in air, while storage treatment did not affect that of 'Northeast'. CO₂ treatment did not affect the antiproliferation activity, but activity was greater at harvest than after storage.

Overall, the strawberry fruit stored at lower temperatures maintained better quality at lower temperatures and RHs. However, the fruit stored at 10°C resulted in good visual quality attributes and higher antioxidant levels if harvested at the white tip stage of ripeness. The strawberry fruit stored under CO₂ treatment maintained physical qualities but the antioxidant levels were higher at air storage.