

**Title** The effects of postharvest hot air treatments in low O<sub>2</sub> atmosphere on the quality and antioxidant levels in tomato fruit

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### **Abstract**

'Rhapsody' tomatoes heated for 24 h in air at 34°C or 38°C were compared to fruit heated in 5% O<sub>2</sub> at 38°C in order to determine if heat treatment applied in reduced O<sub>2</sub> pressure might reduce stress-related oxidative changes that sometimes accompany heat injury. Fruit were subsequently stored at 4°C or 10°C for up to 30 days. Unheated fruit and those heated in air at 34°C for 24 h developed the best color during storage at 10°C. Storage at 4°C inhibited carotenoid development in all treatments. Fruit heated in air or in 5% O<sub>2</sub> lost the most ascorbic acid and isoascorbic acid. Glutathione reductase activity at the end of storage was similar in all fruit, while glutathione S-transferase activity was higher in fruit that had initially been heated in 5% O<sub>2</sub>. Heating of 'Rhapsody' tomato fruit in air at 34°C for 24 h prior to storage at 10°C for up to 30 days resulted in the least losses in antioxidant content, and fruit color developed adequately. Reduced O<sub>2</sub> neither improved the efficacy of the heat treatment in reducing chilling injury nor protected tomato fruit from the negative effects of heat treatment.