

Title Changes in glucoraphanin content and quinone reductase activity in broccoli (*Brassica oleracea* var. *italica*) florets during cooling and controlled atmosphere storage

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Abstract

The effects of cooling and controlled atmosphere (CA) treatments on glucoraphanin content and induction of quinone reductase (QR) activity in broccoli florets were investigated. The results showed that both the glucoraphanin content and QR activity of broccoli florets increased during the initial 6 day of storage, and then decreased markedly at different temperatures of 0, 5, and 10 °C. Immediate cooling of broccoli florets at 0 and 5 °C could preserve the glucoraphanin content and QR activity for 12 days. Keeping broccoli florets at 20 °C for 6 h before cooling at 5 °C had little effects on shelf-life, glucoraphanin content and QR activity. CA treatments with elevated CO₂ (21% O₂ + 10% CO₂, and 21% O₂ + 20% CO₂) and an air treatment (21% O₂) were found to increase the glucoraphanin content and the QR activity over the first 5 days of storage at 5 °C, while CA treatments with reduced O₂ concentrations (1% O₂, 1% O₂ + 10% CO₂) led to a steady decrease of glucoraphanin content and the QR activity during 20 days of storage at 5 °C. The highest content of glucoraphanin and QR activity was found in florets stored under 21% O₂ + 10% CO₂ at 5 °C. These conditions were able to maintain the visual quality, glucoraphanin content and QR activity of the broccoli florets for 20 days.