

**Title** Changes to glucosinolate and flavonoid content of broccoli florets during controlled atmosphere storage

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#### **Abstract**

Controlled atmosphere (CA) storage is known to maintain the visual quality of broccoli florets, but its effect on phytochemical content is not well understood. This study investigated the effect of CA on a range of glucosinolates and flavonoids in broccoli florets during storage. Whole heads of broccoli (cv. 'Marathon') were processed into florets and packaged in perforated bags (mean weight 130g) before being placed in CA chambers at 4°C. The CA treatments (%O<sub>2</sub>:%CO<sub>2</sub>) were 2:6, 0.5:10 and 5:10 with an air control. Samples were removed and assessed for quality, and glucoraphanin, glucobrassicin, neoglucobrassicin, quercetin, kaempferol and isorhamnetin content prior to storage and after 14, 28 and 42 days' storage. Visual quality of all treatments declined over the 42 days of storage with significant differences observed between the CA treatments on any given assessment day. Florets stored for 42 days at 0.5:10 were of significantly better quality than those stored at 5:10 and in air, but were not significantly different to florets stored at 2:6. Glucoraphanin levels increased significantly between day 0 and day 14 in all CA treatments and the air control. An increase in glucoraphanin content was also observed between day 14 and day 42 for all of the CA treatments but not in air. There were no significant differences in glucobrassicin, neoglucobrassicin, quercetin, kaempferol and isorhamnetin contents detected between the treatments during storage. The results demonstrated that CA storage was not only effective in maintaining the visual quality of broccoli florets but resulted in increased levels of glucoraphanin and effectively maintained levels of the other phytochemicals measured.