

Title            Glucosinolate and free sugar content in cauliflower (*Brassica oleracea* var. botrytis cv. Freemont) during controlled-atmosphere storage

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Keyword        *Brassica oleracea*; Cauliflower; Controlled atmosphere; Glucosinolates; Postharvest; Storage quality

### Abstract

No studies have previously been published on the glucosinolate content of cauliflower in air and/or controlled-atmosphere storage. Field-grown cauliflower heads (cv. Freemont) were harvested on three different dates and placed into either air or controlled-atmosphere (3% O<sub>2</sub> and 5% CO<sub>2</sub>) storage at 0 °C. Samples were removed on days 0, 14, 28, 42, and 56 and analyzed for percent weight loss, lightness (*L*), chroma, hue angle, soluble solids, and titratable acidity. Free sugar (glucose, sucrose, and fructose) and individual glucosinolate levels were also determined. Trends in the changes within these assessed parameters during storage were not significantly different among the three harvests. Controlled-atmosphere storage delayed quality loss as determined by percent weight loss, *L*, and chroma values. No differences in free sugar or glucosinolate profiles were found between storage treatments. However, the glucosinolates gluconapin and glucobrassicin increased for each treatment during storage, albeit later in controlled-atmosphere storage. Glucobrassicin was the major glucosinolate component, and the dramatic increase in the concentrations of this compound was reflected in increased total glucosinolate levels of air-stored cauliflower on day 28 of storage. Levels of the other glucosinolates (sinigrin, progoitrin, epiprogoitrin, 4-OH-glucobrassicin, 4-MeOH-glucobrassicin, as well as an unidentified glucosinolate) did not change during storage; glucoiberin content decreased after day 28. Increases in levels of gluconapin and glucobrassicin may be related to metabolic changes associated with natural and/or stress-induced senescence.

**Abbreviations:** CA, controlled atmosphere; *L*, lightness; TSS, total soluble solids; ANOVA, analysis of variance