

**Title**  $\gamma$ -Aminobutyric acid (GABA) accumulation in four strawberry cultivars in response to elevated CO<sub>2</sub> storage

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**Citation** Postharvest Biology and Technology, Volume 57, Issue 2, August 2010, Pages 92–96

**Keywords** GABA; Fermentation; Controlled atmosphere; Strawberry; *Fragaria* × *ananassa* Duch

#### **Abstract**

Accumulation of  $\gamma$ -aminobutyric acid (GABA) is associated with stress factors in plant systems. The objective of the current study was to compare GABA concentrations in four strawberry (*Fragaria* × *ananassa* Duch) cultivars with different tolerances to postharvest CO<sub>2</sub> treatment (20% in air) as indicated by accumulation of fermentation products. Color change of fruit of all cultivars was delayed by CO<sub>2</sub> treatment. Concentrations of ethanol and ethyl acetate increased in CO<sub>2</sub> treated fruit of ‘Jewel’ but not in ‘Allstar’, ‘Earliglow’, and ‘Northeast’. Higher GABA concentrations were associated with elevated CO<sub>2</sub> treatment in all cultivars compared with air, but GABA accumulations were much lower in ‘Allstar’ and ‘Earliglow’ than in ‘Jewel’ and ‘Northeast’. At harvest, glutamate decarboxylase (GAD) activity was greater in fruit of ‘Jewel’ and ‘Northeast’ than in ‘Allstar’ and ‘Earliglow’. GAD activity decreased during storage, but it was not affected by CO<sub>2</sub>. GABA transaminase (GABA-T) activity was lower in CO<sub>2</sub> than air treated ‘Jewel’ fruit, but it was not affected consistently by CO<sub>2</sub> in the other cultivars. The results indicate that high CO<sub>2</sub> treatments increased GABA concentrations in strawberry fruit, but the accumulation is not consistently associated with sensitivity of the fruit to CO<sub>2</sub> as indicated by accumulation of fermentation products.