

Title Influence of calcium dips on biosynthesis of aroma volatile compounds by Fuji Kiku-8 apples
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Abstract

Calcium has been widely used as a preservative and firming agent in the fruit and vegetable industry for whole as well as for fresh-cut commodities. Prestorage calcium treatment of apples has been shown to decrease softening rates as well as the incidence of some physiological disorders and infections, and may also have beneficial side effects on nutritional quality of produce. The favourable effects of calcium applications on firmness preservation of apples (*Malus domestica* Borlch.) are well established, whereas little research effort has been focused on the consequences of such treatments on the rest of attributes influencing sensory acceptability of produce, such as production of aroma volatile compounds. Nevertheless not only texture, but also flavour is a key attribute determining consumer acceptance of apples. In this work, “Fuji Kiku-8” apples harvested at commercial maturity were dipped in calcium chloride (2% w/v) and stored at 1°C and 92% RH for 4 or 7 months under air. Calcium concentration was higher in treated fruit, showing that the treatment was effective in introducing calcium into the tissues. After cold storage for 4 months, calcium-treated fruit showed enhanced production of those aroma volatile compounds considered to have an impact on overall flavour of ‘Fuji Kiku-8’ apples, based on odour units present. Higher aroma volatile emission in calcium-treated fruit possibly arose from enhanced supply of precursors for ester production as a consequence of increased pyruvate decarboxylase (PDC) and alcohol dehydrogenase (ADH) activities. This enhancing effect was less apparent when extending the storage period up to 7 months. Consumer acceptability was also higher in calcium-treated samples. Results show that calcium treatments, apart from having beneficial effects on firmness preservation, may be also useful for improving aroma quality of cold-stored “Fuji Kiku-8” apples.