

# Effect of cutting and storage temperature on sucrose and organic acids metabolism in postharvest melon fruit

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## Abstract

In order to reveal the molecular information of soluble sugars and organic acids both in stored fresh-cut and whole melon fruits, the enzymes and genes involved in the metabolism of sucrose and organic acids in melon fruit (cv. Xizhoumi-17) were investigated. Cutting of fruit and storage temperature significantly affected the content of sugars, citric acid (CA) and malic acid (MA), and the change was controlled by enzymes involved in the metabolism of sucrose and organic acids. Fresh-cut melon had higher content of hexose (fructose and glucose) and organic acids when stored at 15 °C for a short period of time, and this was correlated with higher activities of acid invertase (AI), neutral invertase (NI), sucrose synthase-cleavage (SS-c), phosphoenolpyruvate carboxylase (PEPC), citrate synthase (CS), aconitase (ACO), malate dehydrogenase (MDH) and malic enzyme (ME) and lower activity of isocitrate dehydrogenase (IDH). These patterns were due to the up-regulation of *CmA11/2*, *CmNI3*, *CmPEPC3*, *CmCS1*, *CmACO1/2*, *CmMDH1/3* and *CmME3/4* and down-regulation of *CmIDH1* in fresh-cut melon. Compared with fresh-cut melon stored at 15 °C, lower temperature (5 °C) significantly extended the shelf life and reduced the quality loss as indicated by higher content of sucrose, CA and MA in fresh-cut fruit stored at 5 °C. These differences resulted from the up-regulation of *CmPEPC2/3* and down-regulation of *CmA11/2*, *CmNI3*, *CmCS1*, *CmACO1/2* and *CmME3/4* during the storage period.