

Managing Apple Maturity & Post-Harvest Storage to Increase Polyphenols in Cider

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Summary: Hard cider production in the United States has increased dramatically in the last decade, but there is little information on how harvest and post-harvest practices impact the chemistry of the resulting cider, including concentrations of organoleptically important flavanols. Over two years we assessed fruit, juice, and cider from a total of five apple (*Malus xdomestica* Borkh.) cultivars in two experiments: sequential harvests and post-harvest storage. Different cultivars were used in 2015 and 2016 with the exception of ‘Dabinett’ which was assessed in both years. There were no differences in polyphenol concentrations in cider made from fruit that was harvested on three separate occasions over a four-week period in either 2015 or 2016. Fruit storage durations and temperatures had little influence on the chemistry when the experiment was conducted in 2015, but polyphenol concentration was greater after storage in the 2016 experiment. In 2016, total polyphenols in ‘Dabinett’ ciders were 51% greater after short-term storage at 10 °C and 67% greater after long-term storage at 1 °C than the control which was not subjected to a storage treatment. In 2016, total polyphenols in ‘Binet Rouge’ ciders were 67% greater after short-term storage at 10 °C and 94% greater after long-term storage at 1 °C than the control. Though results varied among cultivars and harvest years, storing apples for longer periods of time and at higher temperatures may be a strategy to increase polyphenol, particularly flavanol, concentrations in hard cider.

Dropping Knowledge: Using Ground-Harvested Fruit for Cider Production in Compliance with the FSMA Produce Safety Rule

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Summary: Apples (*Malus domestica*) are considered covered, or “non-excluded”, produce under the Food Safety Modernization Act Produce Safety Rule. The rule states that fruit that has unintentionally come in contact with the ground may not be used for human consumption unless there have been sufficient processing steps to reduce the risk of human pathogens in the final food product. Cider apples destined for hard cider production in many regions have traditionally been harvested at full ripeness when the fruit naturally drops or is easily shaken off the tree. This work reviews the status of cider apples under the Produce Safety Rule, presents the human pathogens of concern with usage of ground-harvested fruit, and describes recommendations including processing steps for cider apple growers and cider producers so they can ensure that their product is safe and that they are complying with the rule.