

Title Effect of ethylene and temperature conditioning on sensory quality of European pear fruits

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Abstract

Most European pears, including Bartlett and Comice pears, resist ripening after harvest. Ethylene, cold temperature (-1 to 0 °C), and intermediate temperature (5 to 10 °C) conditioning have been found to stimulate high ethylene biosynthesis and fruit ripening. However, few studies have compared the sensory attributes of fruit stimulated to ripen by these various conditioning treatments. The aim of my research was to evaluate changes in physiochemical composition and sensory attributes of Bartlett and Comice pears exposed to ethylene, 0 °C, or 10 °C to stimulate ripening. Fruit composition, generally associated with aroma, texture and taste of the fruit, were evaluated, including volatile production, cell wall polyuronide levels, sugar and acid content. Sensory descriptive analysis evaluating pear aroma, texture and taste attributes was also carried out. We found that both Bartlett and Comice pears softened fastest when conditioned with ethylene or at 10 °C, while fruit ethylene production was highest in fruit treated with ethylene or exposed to 0 °C. Fruit treated at 0 °C or 10 °C had higher sensory aroma and texture scores than ethylene treated fruit. Fruit conditioned at 0 or 10 °C developed high levels of esters which have fruity, sweet, pear notes, while ethylene treated and untreated fruit had high concentrations of aldehydes which have a green odor. Fruit conditioned at 0 or 10 °C were perceived as juicy whereas ethylene treated fruit were perceived as crunchy, although there were no differences in fruit firmness as measured by a penetrometer and no significant differences in water soluble polyuronide levels among treatments. Conditioned Bartlett fruit had higher sweet and fruity taste sensory scores than untreated fruit, while for Comice, there were no significant differences in taste sensory scores among conditioning treatments once the fruit softened to 9 N firmness. Untreated Comice pears were not evaluated because they did not ripen. However, it is important to determine whether the differences in sensory attributes among these conditioning treatments will influence consumer preferences before the industry can determine the best conditioning treatment to use to maximize consumer satisfaction.