

Abstract:

Red raspberries (*Rubus idaeus* 'Killarney') were harvested twice at the full ripe stage and held for 7 days at 0, 5, 10, 15, or 20 °C. The objectives of this work were 1) to obtain quality curves for raspberries stored at different temperatures; 2) to identify, for each temperature, which quality factor(s) limits raspberry marketability; and 3) to compare the quality curves and shelf-life of raspberries based on quality evaluations with those predicted by respiration rates reported in the literature. Raspberry weight loss, instrumental color ($L^*a^*b^*$), visual color, firmness, shriveling, decay, taste and aroma were evaluated every day for a 7-day storage period. Darkening of the color was the primary limiting factor at 0, 5, 10 and 15 °C for raspberries from the first harvest, while darkening of the color, loss of firmness and objectionable aroma were the primary limiting factors at 20 °C. For raspberries from the second harvest, darkening of the color, objectionable taste or aroma was the primary limiting factor for fruit stored at 0 or 5 °C. Development of off-flavor was the primary limiting factor for raspberries stored at 10 or 15 °C, and objectionable aroma was the primary limiting factor for those fruit stored at 20 °C. For each temperature, the shelf life of raspberries predicted based on the Q_{10} calculated from reported respiration rates was on average 1 to 2 days longer at 0 °C, the same number of days at 10 and 20 °C and less than 1 day shorter at 5 and 15 °C when compared with the shelf life of raspberries obtained from quality evaluations. The results showed that a single quality attribute cannot be used to express loss of quality of raspberries over the normal physiological range of temperatures and that raspberry shelf life is closely correlated with respiration rate.