

Quality and Shelf Life of Standard Strawberry Cultivars and New Breeding Selections

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Summary

Postharvest quality of strawberries ‘Florida127’, ‘Florida Brilliance’, FL 16.30-128, and FL 16.33-8 was evaluated for nine days at 1.5 °C (34.7 °F). Overall, FL 16.30-128 had better color and texture after storage. In contrast, FL 16.33-8 received better ratings for shriveling and had lower weight loss compared to the commercial standards.

Methods

Storage conditions. Sweet Sensation® ‘Florida127’ (hereafter Sensation®), ‘Florida Brilliance’, FL 16.30-128, and FL 16.33-8 were harvested on January 23, February 13, and March 5, 2020, and transported to the USF Food Quality Laboratory (FQL) in Tampa, within minimal delay after harvest. On arrival, the fruit was selected for uniformity of color and freedom from defects, carefully packed in polyethylene terephthalate (PET) vented clamshells (capacity ≈1lb), and stored for nine days inside a temperature- and humidity-controlled chamber (Forma Environmental Chambers Model 3940 Series, Thermo Electron Corporation, OH, USA). Chamber conditions were set at 1.5 °C (34.7 °F) and 85% RH, which simulates the lowest temperature and highest RH measured during real strawberry field-to-store trials. Temperature and RH were monitored throughout the experiments using battery-powered data loggers (Hobo® U10 Temp/RH data logger, Onset Computer Corporation, Pocasset, MA, USA).

Quality evaluation. Strawberries were evaluated for sensory quality (color, firmness, shriveling, and decay) and for physical and compositional attributes

at harvest (day 0) and after 3, 5, 7, and 9 days of storage. Only data for sensory quality, instrumental color and texture, and weight loss are presented in this report. Data are averages of three harvests.

Results

Sensory quality. Sensation® ‘Florida Brilliance’, FL 16.30-128, and FL 16.33-8 maintained an excellent sensory quality during cold storage (Fig. 1).

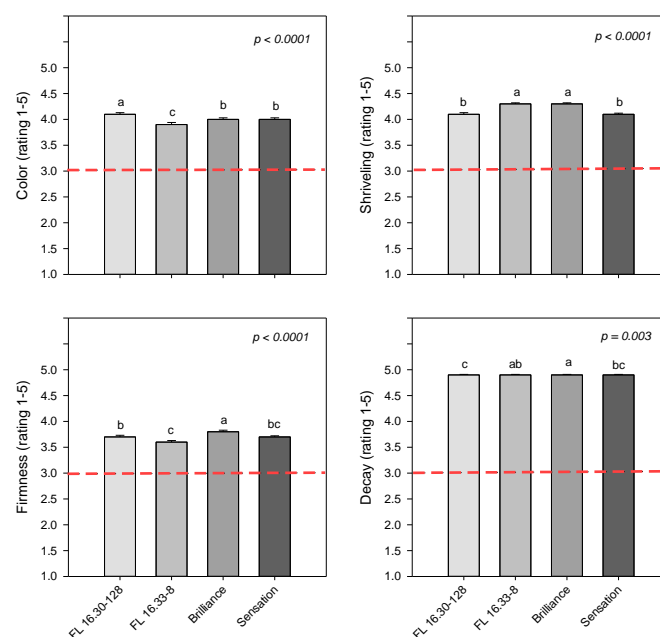


Figure 1. Color, shriveling, firmness, and decay of FL 16.33-8, FL 16.30-18, ‘Florida Brilliance’ and Sensation® after 9 days of storage at 1.5 °C (34.7 °F) and 85% RH. Dashed red lines represent the maximum acceptable for sale (5 = best, 3 = acceptable; 1 = poor).

On average, after 9 days, the ratings for color, firmness, shriveling, and decay were still above a rating of 3.0 (acceptable) for all cultivars. However, after cold storage, FL 16.30-128 received better ratings for color when compared to other cultivars and was firmer than Sensation® and FL 16.33-8. Compared with the other cultivars, FL 16.33-8 showed less shriveling and decay.



Figure 2. The appearance of Sensation®, ‘Florida Brilliance’, FL 16.30-18 and FL 16.33-8 (top to bottom) after 9 days of storage at 1.5 °C (34.7 °F) and 85% RH.

Figure 2 shows that Sensation®, ‘Florida Brilliance’, FL 16.30-128, and FL 16.33-8 maintained an excellent appearance after 9 days of cold storage. Overall, these results suggest that the postharvest life of the selected strawberry cultivars could be extended beyond 9 days if continuously kept at 1.5 °C (34.7 °F) and 85% RH.

Physicochemical quality. As seen in previous seasons, after cold storage, Sensation® had a lighter (higher L* value) and less red color (higher hue angle values) compared to other cultivars (Fig.3). On average, there was no significant difference between the L* values of FL 16.30-128, FL 16.33-8, and Brilliance. However, Brilliance showed higher hue angle values (less redness) compared to FL 16.30-128, FL 16.33-8.

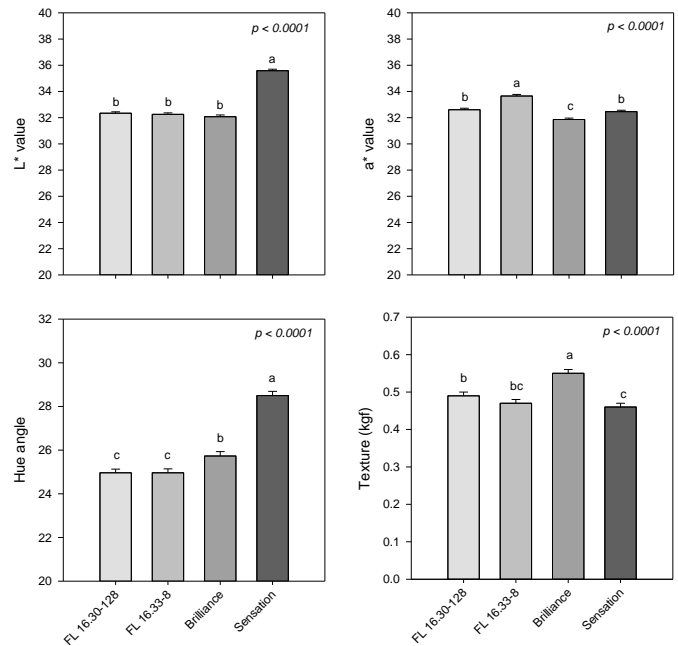


Figure 3. Color attributes (L* = lightness; a* = red-green and hue angle = color) and texture of FL 16.33-8, FL 16.30-18, ‘Florida Brilliance’ and Sensation® after 9 days of storage at 1.5 °C (34.7 °F) and 85% RH.

On average, after 9 days of cold storage, Brilliance was the firmest cultivar followed by FL 16.30-128, which had firmness that was not significantly different from that of FL 16.33-8 (Fig. 3). Sensation® was the softest cultivar but not substantially different from FL 16.33-8.

On average, FL 16.30-128 strawberries lost the most weight during storage (7 %), whereas FL 16.33-8 lost the least weight (5%). After 9 days, there was no much difference between the weight loss of Sensation and FL 16.30-128 (Fig. 4).

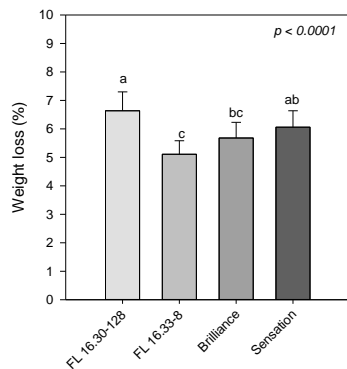


Figure 4. Weight loss of FL 16.33-8, FL 16.30-18, 'Florida Brilliance' and Sensation® after 9 days of storage at 1.5 °C (34.7 °F) and 85% RH.

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