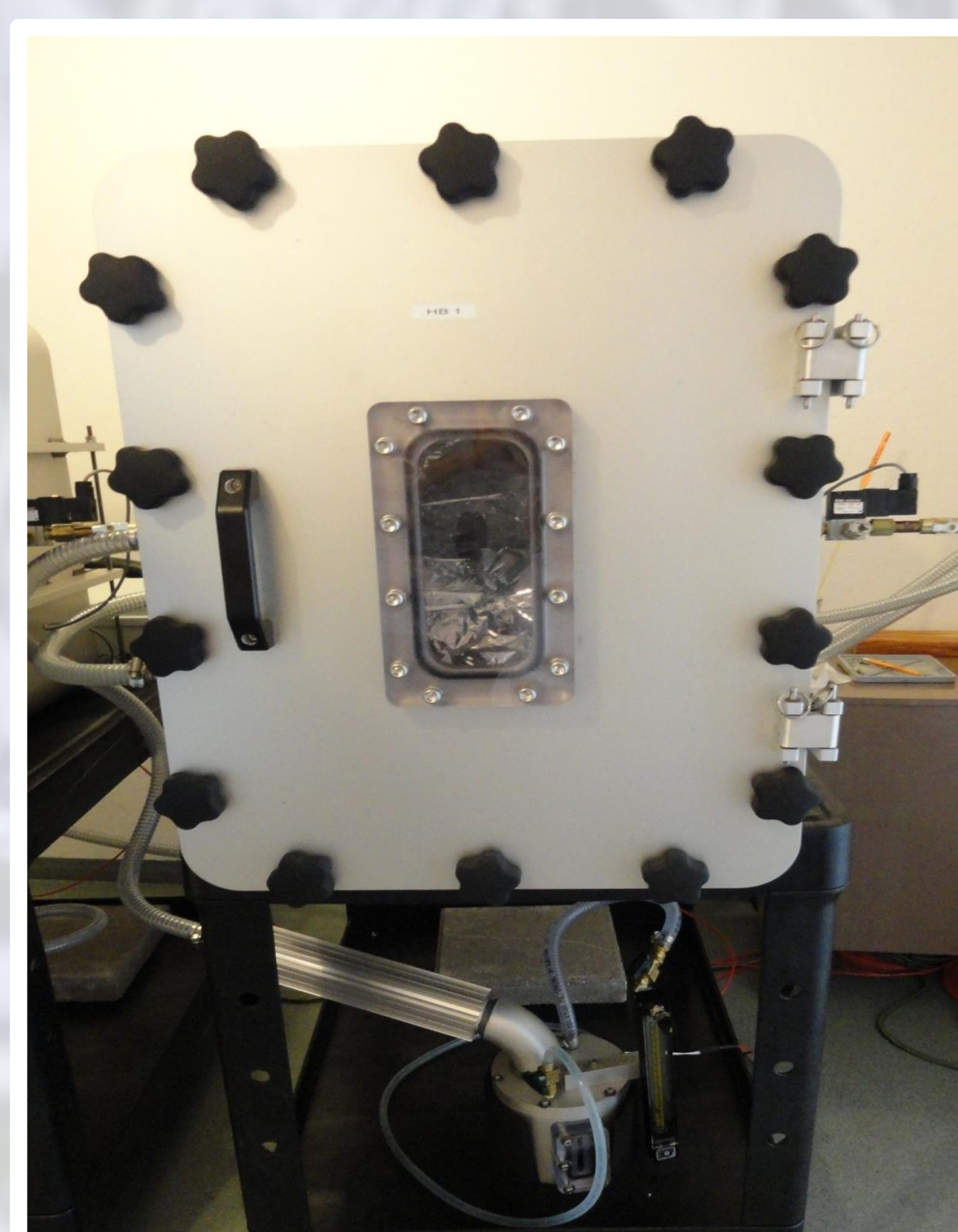


Introduction

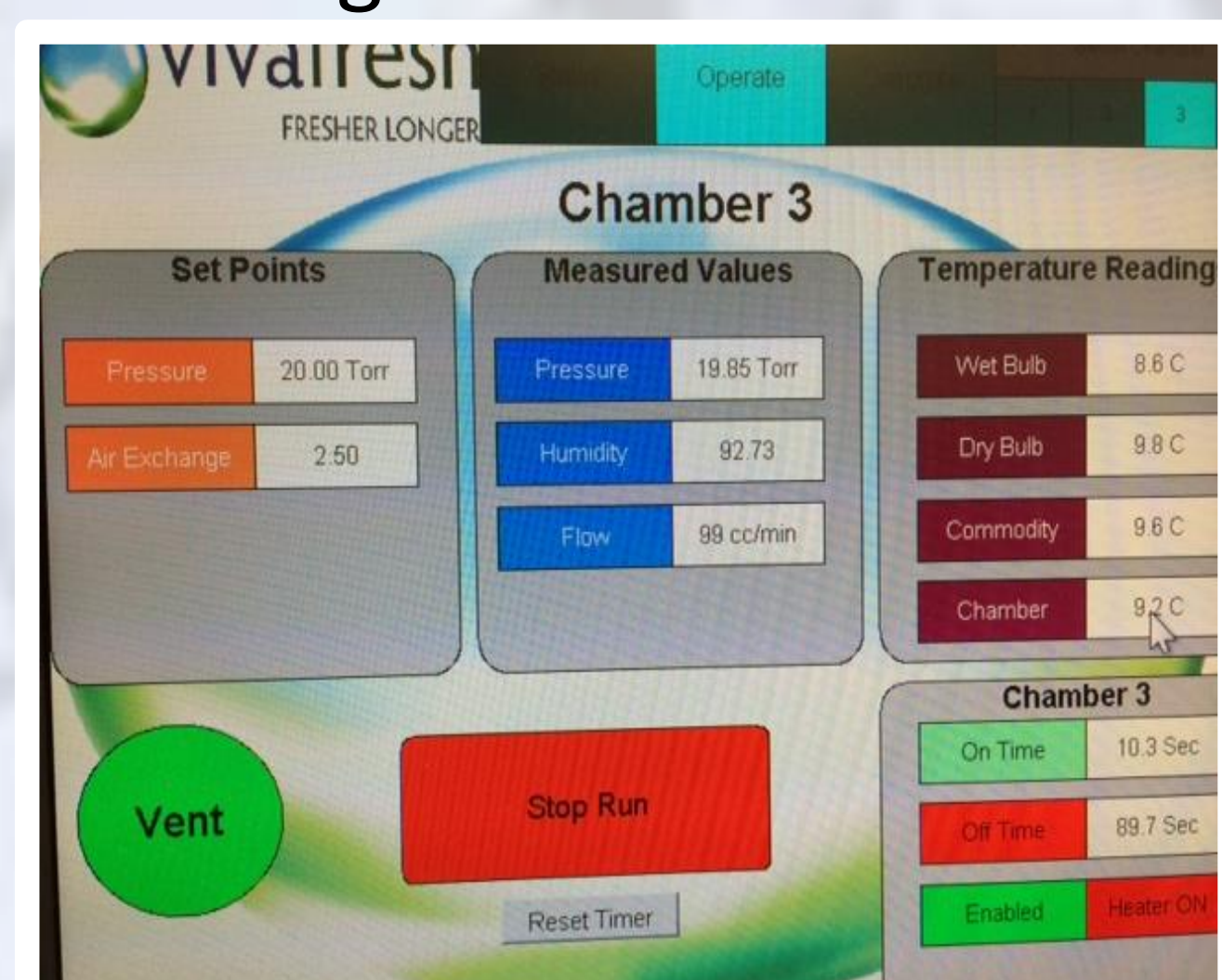
Producers and exporters of fresh tropical fruit gain an advantage in the marketplace by supplying unique, high quality products. However, the storage life of most tropical fruit is insufficient to reach distant markets by marine transport. Hypobaric (low oxygen partial pressure) conditions may extend the storage life of refrigerated fresh tropical fruit without loss of edible quality, thereby creating a means to ship fresh fruit in sea containers. The quality and storage life of Hawaii-grown 'Rainbow' papaya (*Carica papaya*), 'Haden' mango (*Mangifera indica*), and cherimoya (*Annona cherimola*) were determined under hypobaric (2.7 kPa) and cold (10 to 13 °C) storage conditions.



Hypobaric chamber with humidifier.



Mangos inside chamber.



Computer controlled parameters.



Cherimoya after 13 days; controls (100kPa) (L), hypobaric (2.7kPa)(R).



Hypobaric treated cherimoyas; after storage for 20 days (L), ripe fruit at day 23 (R).



Hypobaric treated papayas; after storage for 22 days (L), ripe fruit at 29 days (R).



Hypobaric treated mangos; after storage for 28 days (L), ripe fruit at 29 days (R).



Results

- Postharvest life was extended by 10 days for cherimoyas, by 7 days for mangos, and 5 days for papayas under hypobaric conditions (2.7 kPa) when compared to control fruit (100 kPa).
- Visual quality after ripening was higher for cherimoyas and mangos stored under hypobaric conditions. However, visual quality was inferior for hypobaric treated papayas when compared to controls due to a higher incidence of stem end rots.
- Most quality attributes did not differ between storage methods including taste, brix, soluble solids, color, and firmness.

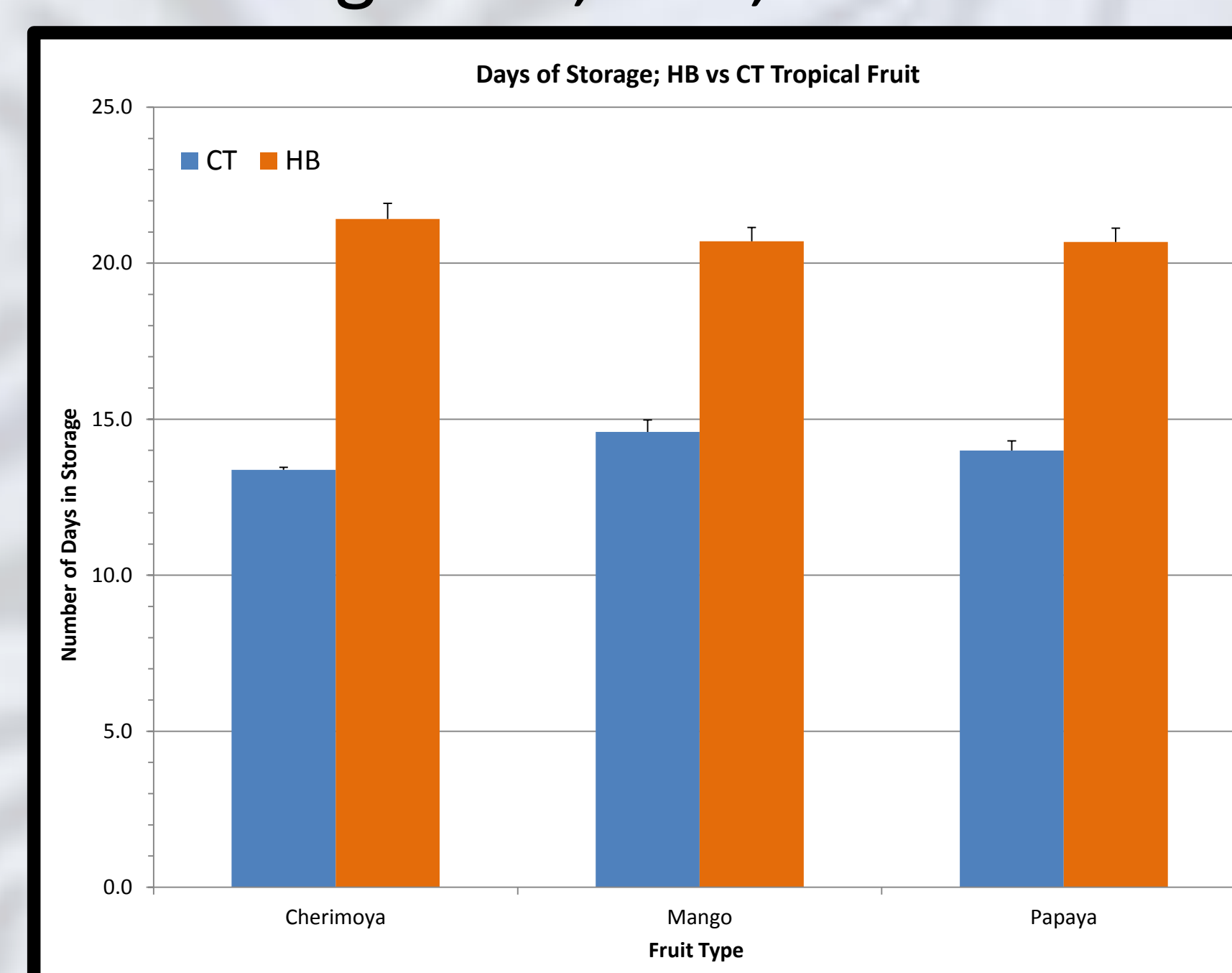


Fig. 1. Days in storage for tropical fruit.

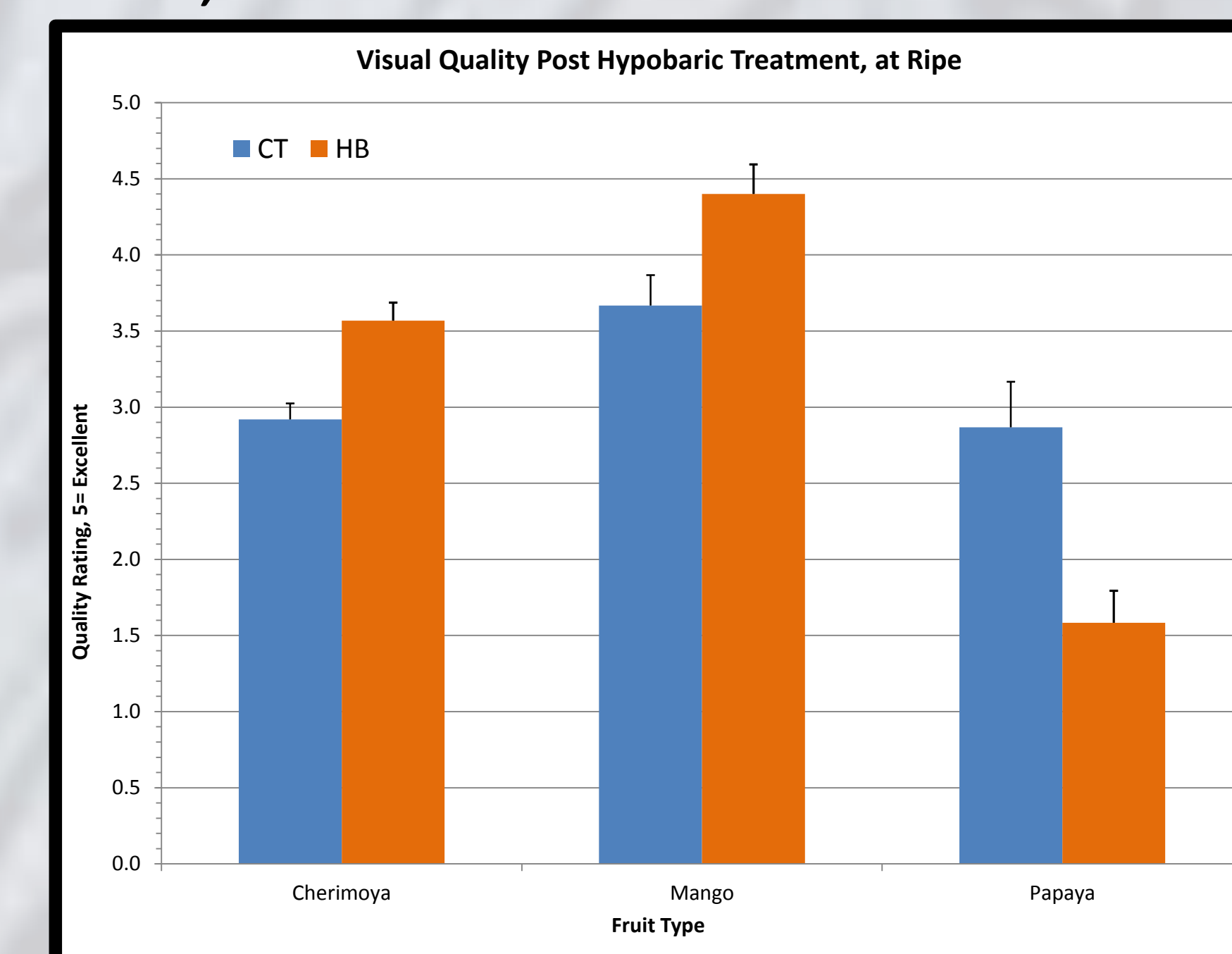


Fig. 2. Visual quality of stored fruit.

Methods

- Four custom fabricated, stainless steel hypobaric chambers (Vivafresh R&D, Atlas Technologies) were used for the study. The system was equipped with computer controlled vacuum pressure regulation, controlled air flow rate, 100% humidification, temperature sensors and data acquisition.
- Treated fruit were held under hypobaric (2.7 kPa) conditions inside a cold room (10 °C for papayas, 13 °C for cherimoyas and mangos). Control fruits were held in chambers at atmospheric pressure (100 kPa) and cold temperatures for comparison.
- All fruit were at the mature green ripeness stage initially and evaluated for quality before and after storage, and upon ripening at ~ 23 °C for visual quality, color, firmness, soluble solids, titratable acidity and disease incidence.

Conclusions

Hypobaric conditions extended storage time and delayed ripening of cherimoyas, mangos and papayas compared to control fruits. These tropical fruit ripened normally after removal from hypobaric storage, although disease incidence after ripening was not inhibited in most trials.

