POSTHARVEST CENTER
UNIVERSITY OF CALIFORNIA

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What's Key in this Issue

Director's Note

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Reducing food loss and waste is an important part of a sustainable food system. Because of their perishable nature, a significant portion of the fruits and vegetables produced are never consumed by humans, as intended. Of course, there are a variety of reasons for these losses; rigid grade and market standards, poor temperature management, physical damage, disease issues, food safety regulations and concerns, and short shelf life products.

There has been a lot of interest in recent years in reducing food losses and thereby enhancing sustainability. One of the best ways is to educate yourself and your staff about the recommended practices for handling your produce items. Last month, we held our second virtual Postharvest Technology of Horticultural Crops Short Course during which participants learned all about postharvest biology and technology, as well as recommended handling practices.

The Postharvest Technology Center has a wealth of free information on our website, and if you download the UC Produce Facts App you can have the basic recommendations at your fingertips. You can also find some excellent publications on our website, including booklets on cooling practices, and transportation recommendations. Stay tuned for some new and updated publications coming later in 2021 or in 2022!

Nearly every week I learn about a new technology designed to reduce produce losses. Postharvest researchers throughout the country have conducted trials to test the application of a range of technologies, and there are some promising developments. However, it is wise to remember the basics of postharvest handling and work to ensure you are optimally covering these basics (proper harvest maturity, rapid cooling to optimum temperature, careful handling to reduce damage, and expedited handling whenever possible) before investing in new technologies.

Beth Mitcham

Postharvest Education at UC Davis

Upcoming Postharvest Educational Opportunities

Produce Professional Certificate Program :: Ongoing

Produce Safety Program Implementation Tools :: November 2-4, 2021

Aligning the Food Systems Workshop: Emerging technologies to address grand challenges in the produce industry :: January 18-20, 2022

Fruit Ripening & Ethylene Management Workshop :: April 5-7, 2022

Postharvest Technology of Horticultural Crops Short Course :: June 13-24, 2022

Our Website & Social Media

Highlights of New Publications on our Website

Felipe Becerra- Sanchez and Gail Taylor, 2020. Characterising the sweet corn postharvest supply chain: travel from Senegal to the UK. ***Int. J. Postharvest Technology and Innovation, Vol. X, No. Y, 2020***

An optimal supply chain, to preserve sugars and antioxidant capacity is essential to maintain the quality of sweet corn. The choice of packaging film plays an essential role, especially in products with a high respiration rate such as sweet corn. Sweet corn grown on a commercial farm in Senegal was sampled at harvest, upon arrive in the UK following 12–14 days of shipping, at the best before date, and at 5 days after the best before date. Sweet corn is usually harvested and hydro-cooled on-farm and shipped in refrigerated containers to the UK, where it is further processed and packed for the fresh-cut market.

The results showed that high quality preservation of sweet corn is possible along a complex supply chain from harvest in Senegal through transport to the UK. The loss of sugars and antioxidant capacity during the shipment of sweet corn from Senegal to the UK was insignificant. Low temperatures and the modified atmosphere developed in the containers were effective at preserving sweet corn quality during shipping. Similarly, after transport and processing, assessment of sweet corn at the end of the commercial shelf-life revealed no significant decline in sugars for undamaged kernels. When kernels were damaged, significant decline in antioxidant capacity was observed. Results suggested that lower perforation films have a beneficial role in preserving antioxidant capacity. Furthermore, damaged kernels in the cut-ends of the cobs were shown to be the main factor reducing the overall quality of the product.

Felipe Becerra- Sanchez and Gail Taylor, 2021. Reducing post- harvest losses and improving quality in sweet corn (Zea mays L.): challenges and solutions for less food waste and improved food security**. Food and Energy Security DOI: 10.1002/fes3.277**

This comprehensive review assembles a description of the most customer-appreciated sweet corn characteristics. And it describes the major sweet corn post-harvest challenges. The authors found that post-harvest shelf life and quality can be best preserved and enhanced by (a) keeping temperatures as close as possible to 0°C throughout the post-harvest process, which is the most important factor to extend sweet corn shelf life, (b) reducing field and respiration heat in sweet corn by rapid hydrocooling. In addition to low temperatures, and (c) the use of films to create a modified atmosphere. A modified atmosphere of 10% O2 and 15% CO2 is optimal for fresh-cut sweet corn stored at low temperatures (0–5° C).

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Postharvest Opportunities

Research Microbiologist/Research Food Technologist

The USDA-ARS Southeastern Fruit and Tree Nut Research Unit in Byron, GA is seeking a postdoctoral position, Food Technologist GS11, salary commensurate with experience. The research assignment is to develop new and improved pecan processing technologies, with emphasis on pasteurization for improved storage, food safety, nutrition, and marketability.

The incumbent will conduct independent and cooperative research within this focus area as well as other related areas as assigned by the unit leader. A Ph.D. in food technology, food science, microbiology, or a related field is required. Experience with pasteurization processes and or tree nut commodities is a plus. Citizenship requirements may apply. If you are interested in obtaining this position please submit a cover letter and your CV along with the names and contact information of three references to David Shapiro-Ilan, (Research Leader, USDA-ARS Byron, GA) at David.Shapiro@usda.gov. For more information you can contact Dr. Shapiro-Ilan via email or phone (478-262-1670). The position is slated to begin October 1, 2021 (but the date is negotiable). Applications will be reviewed as they arrive until July 30, 2021. USDA-ARS is an Equal Opportunity Provider and Employer.

Postharvest Calendar

- June 22-July 20, 2021. **Center for Produce Safety Research Symposium**. Center for Produce Safety. Virtual Weekly Sessions
- November 2-4 2021. **Produce Safety Program Implementation Tools**. UC Postharvest Technology Center, Davis, CA. Details to follow.
- January 18-20, 2022. **Aligning the Food System - Emerging technologies to address grand challenges in the produce industry**. UC Postharvest Technology Center. Davis, CA
- August 14-20, 2022. **International Horticulture Congress**. Angers, France
- November 11-15, 2024. **Postharvest 2024**, ISHS International Postharvest Symposium, Rotorua, New Zealand

Ask the Produce Docs

Q. I am in the process of a Food Safety Audit and our auditor raised a question: what is the ethylene residue after ripening? If it is involved in the ripening, there must be some consumption happening. Is the consumed ethylene safe as per food safety law or what is residual after ripening?

A. First, ethylene is a naturally occurring plant hormone that the product produces for a number of biochemical and physiological purposes during growth and development. All plant parts have the capability to produce ethylene.

Second, there is no "residue" after the fruit are commercially exposed to ethylene. When we provide ethylene to a product the product takes up ethylene which in turn will stimulate the ripening process. There will be no excess ethylene remaining in the product after ripening, although to point 1 above, the product may be naturally producing additional ethylene after the exogenous ethylene is removed.

Third, to my knowledge there is no food safety law regarding this topic. I know every country varies with its regulations but in the USA, this is not a problem.

Mary Lu Arpaia

Editor's Note: In the USA, ethylene is only applied as a gas from prepared cylinders or more commonly from a catalytic generator that produces ethylene from ethanol. Use of Ethephon or other means to produce ethylene are not approved for use on harvested products.

Postharvest Questions. If you have a postharvest question you'd like answered, please send it to postharvest@ucdavis.edu, and we'll see if one of our specialists can help.

Archived Items. Link to a data store of all our previous "Ask the Produce Docs" questions, or link to archived copies of our e-newsletter as PDF documents.

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