Infiltration Station

Supplies needed: Tomatoes on the vine, a few carrots, a meat thermometer, ice water, blue food coloring, a wash basin, a knife with cutting board

Key concepts:

a. How to measure pulp temp
b. Temperature differentials above 10 degrees matter
c. Thermometer calibration.

Where this fits in the PSA GT: Module 5.2

The Setup: In the Produce Safety Rule, § 112.48(c) states, "You must maintain and monitor the temperature of water at a temperature that is appropriate for the commodity and operation (considering the time and depth of submersion) and is adequate to minimize the potential for infiltration of microorganisms of public health significance into covered produce."

It is important to think about infiltration when considering use of a dunk tank as compared with, for example, single-pass water. Low susceptibility to infiltration is an advantage of using single pass water. Not all produce is created equal with regards to infiltration. Some covered crops (tomatoes, mangoes, cantaloupe) are VERY susceptible to infiltration while others (carrots?) are not. When making decisions about postharvest treatment, consider avoiding use of immersive batch water (dunk tanks, flumes) on high risk crops. If immersion in batch water is necessary, use sanitizer and monitor its efficacy as appropriate for the crop.

Other factors that influence infiltration risk include length of submersion and depth of submersion.

The Demo: Prepare an ice water bath. Add blue food coloring until it's Ty-Dee-Bowl blue. Heat the tomatoes up to 150 degrees in an oven with the stem on. Remove warmed produce. Purposefully damage some of the produce

- Scratches and abrasion to simulate damage using a sharp knife or a zester.
- Simulate bruising caused by drops by dropping the produce onto the table

Add produce to the ice water bath and wait as long as possible (e.g., 5 minutes) before slicing them. Once finished discussing infiltration, slice open one or two of the fruits. (Note: slice them through the stem end. The fresh scar tends to suck up the most dye and it is most noticeable against the white background of pith).

Maintain a few tomatoes in a warm state and demonstrate taking of pulp temperature using a meat thermometer on them. Make sure to point out the dimple on the meat thermometer that indicates the depth for insertion of the thermometer. Point out the nut on the bottom of the face that is used for calibration and demonstrate calibration with the ice water bath.

Citation: GLENNER M. RICHARDS and LARRY R. BEUCHAT (*2004*) Attachment of Salmonella Poona to Cantaloupe Rind and Stem Scar Tissues as Affected by Temperature of Fruit and Inoculum. Journal of Food Protection: July 2004, Vol. 67, No. 7, pp. 1359-1364.

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