Postharvest Safety
Tropical Fruits

Robert E. Paull
Tropical Plant & Soil Sciences
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We live in a different world?
Changes in Consumers

- Aging – living longer
- More health conscious – often based on fear
- Purchasing practices and cooking skills
- Greater demand for quality
  - Appearance, freshness, ripeness, taste/flavor, safety
Maradol papaya
Carica de Campeche – Tenabo – Mexico 30,000 ton/year
Caraveo Produce & El Zapotanito fruit positive, not on US market
Brands
- Caribena
- Cavi
- Valery
Impact
- 201 ill in 23 states
- One death
- 65 hospitalized
This Outbreak

- Misinformation
- Wrong variety shown
- Fruit from specific farms in southern Mexico
- Maradol large fruit yellow skin when ripe
Not just raw eggs or chickens. Outbreak due to peanut butter and pet turtles.

Symptoms diarrhea, fever, and abdominal cramps

12 - 72 hours after infection, and lasts 4 to 7 days. 10 cells or more
Time to React and Recall

Number or Symptoms

- Supermarket
- Home

Days from harvest

- 1st Symptoms
- Visit doctor
- Hospitalization
- CDC-FDA Acts

To Distribution Center
Reasons for Increased Food Poisoning

- Better reporting State Health & CDC
- More complex handling systems
- Greater opportunity for contamination
- Wider distribution of potentially contaminated product
Causes of contamination

Most Common Sites

- Poor production practices
  - Irrigation water
  - Biological soil amendments - compost
- Domestic and wild animals
- Poor cleaning and sanitizing throughout the chain
  - Facilities and equipment
- Personal hygiene and work habits - poor training
Microorganisms that cause

**Food Loss**
Affect aroma, texture and/or appearance of food.

**Foodborne illness / Poisoning**
May not affect food appearance & taste.

Only laboratory testing can tell if harmful microorganisms or toxins are present – some are difficult to detect or cannot be detected.
Why Fresh Produce are Very Vulnerable?

- Range of products & postharvest practices
- No kill step – ‘Layers of Protection’
- Washing spreads contamination
- Not frozen – microbial growth possible
- Widely distributed
- Perishable - rapidly consumed after harvest
Harvest Consideration

- Ideal – pick dry fruit
- Leave fruit that may have bird droppings on it
- Use clean totes
- Train workers on importance of hand-washing
- Cool product quickly
Worker Training
– Food Safety

- A farm and packing shed worker is often the last person to handle the produce before the consumer.
- Workers have critical role in preventing microbial contamination.
- Clean restrooms with soap, water, and single-use towels essential.
- Enforce proper use of facilities.
Layers of Protection

- Prevent food-borne illness need to enforce “Layers of Protection”.
- No single step able to provide protection.
- Leading causes of food-borne fresh produce illness associated breaks in the food safety “Layers of Protection”:
  1. Production practices, personal hygiene and work habits
  2. Time and temperature discipline
  3. Proper cleaning and sanitizing
Water Wash After Harvest – Most Effective Step

- Single most important critical point – possible increase and spread contamination.
- Use potable water for all produce washing, cooling, dipping, icing, and processing.
- Monitor effectiveness is paramount to success – chlorine level, pH.
  - Maintain constant chlorine 100-150 ppm.
  - Contact time 1 - 2 minutes
- Change wash water regularly – daily.
- Keep records.
Steps to Reduce Risk

- All post-harvest management practices that reduce losses – reduce microbial contamination risks.
- Steps: - sorting, quick cooling, chlorinated wash water, refrigeration during storage and shipping.
- Teach worker importance of hygiene.

- Use of manure
- Exclude animals from fields
- Water quality for growing & washing
  - Chlorination
  - Potable
  - Solar pasteurization
- Worker and field sanitation
- Postharvest handling – cooling & packing
- Transportation – clean bins & trucks
- Clean and sanitize area
- Market the product as quickly as possible

- GAP, GHP, GMP
Quality Success – Postharvest Handling

- Growing for Consistent Quality and Supply
- Maturity at Harvest
- **Careful Handling**
- Proper Management of Environment
  - Temperature / Relative Humidity / Atmosphere Composition / Ventilation
- Sanitation – ‘Layers of Protection’
We’re going to build the greatest dog park. It’s gonna be great. Probably the greatest park ever built....

..... and the cats.
The cats are going to pay for it.
Thank you!

Any Questions?

Robert E. Paull
Tropical Plant & Soil Sciences
College of Tropical Agriculture and Human Resources
University of Hawai‘i at Mānoa
paull@hawaii.edu