Plant Sanitation & Employee Hygiene Food Safety Solutions

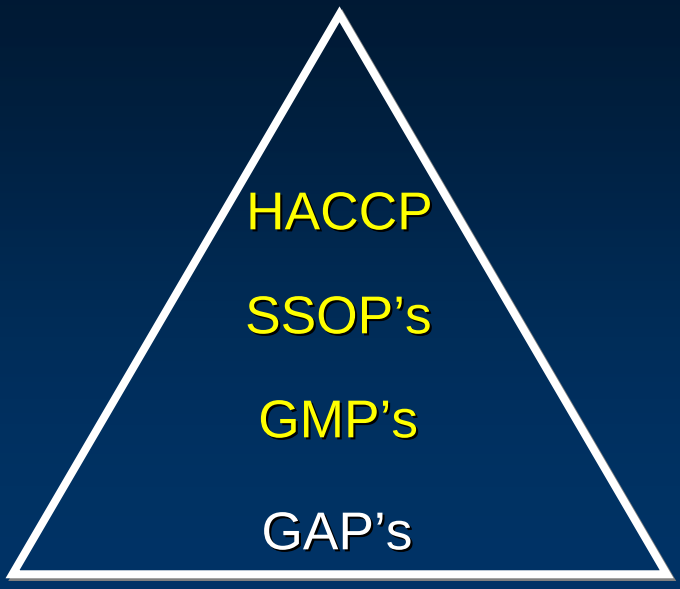
Linda J. Harris
Department of Food Science and Technology

Slides adapted with permission
from Jim Gorny
United Fresh Fruit and Vegetable Association

Fresh-Cut Processing Plant

- GAP's
- GMP's (Mandatory)
- SSOP's (Voluntary)
- HACCP (Voluntary)
- Customer Audits
- Third Party Audits (DFT, QTV, AIB)

Food Safety Program Hierarchy



Good Agricultural Practices (GAP's)

No Kill Steps in Fresh-cut Processing

Washing will NOT Eliminate Hazards

Cross Contamination Potential Increases in Processing Facility

Good Manufacturing Practices GMP's (CFR 110)

"GMPs are guidelines to assure that food for human consumption is safe and has been prepared, packed and held under sanitary conditions"

CFR 110.1

GMPs cover:

- General Provisions
  - Personnel
- Buildings and Facilities
- Equipment
- Production and Process Controls

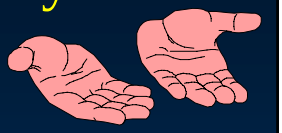
- Plant Construction & Design
  - Rudi Groppe (next presentation)

Good Manufacturing Practices

21 CFR Part 110.10 b

- Persons in contact with food or food contact surfaces
  - Must adhere to good hygienic practices
    - Prevent contamination of food

Humans Harbor a Variety of Microorganisms



- Transient/temporary pathogens
  - Includes all foodborne pathogens
  - Sources include:
    - Soil/dust
    - Raw materials
    - Dirty equipment/utensils
    - Feces

Recommendation

- Employee experiencing the following symptoms should be restricted from working with food :
  - Vomiting
  - Diarrhea
  - Fever
  - Sore throat
  - Jaundice
  - Common cold

- They must be instructed to report symptoms to supervisor

21 CFR Part 110.10a

Workers with Disease Symptoms

- Reporting illness
  - Training and Compliance
    - Consequence of compliance
      - Treatment
      - Alternative work or leave
  - Sick employees should not have direct contact with
    - Fresh produce
    - Packaging materials that contact produce

Personal Hygiene Begins with Good Health Habits

- Bathing regularly
- Washing hair
- Wearing clean and adequate clothing

- **Frequent and proper hand washing**

21 CFR Part 110.10b(2)

- **Clothing**
  - Dirty or soiled clothing is a source of contamination
  - Clothing should be clean and adequate
  - Items should not be stored in pockets

21 CFR Part 110.10b(1)

- **Jewelry**
  - Should not be worn in a food processing facility
  - Physical hazard
  - Accumulates dirt/grime, difficult to wash

21 CFR Part 110.10b(4)

21 CFR Part 110.10b(6)

Hair

Problem

- A source of physical and microbiological contamination
- Hair can be a worker safety issue

Solution

- Keep hair clean
- Use hair/beard nets
  - Discourages workers from touching their hair
  - Prevents hair from falling into food or onto food contact surfaces

Mouth and Respiratory Tract

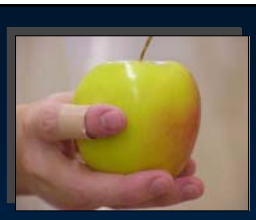
21 CFR Part 110.10b(8)

Problem

- **Healthy individuals can harbor pathogens in their mouth or respiratory tract**

Solution

- **Consumption of food, chewing gum, drinking, or using tobacco must be prohibited in a food processing area**
- **"Do not expectorate or discharge any substance from nose or mouth onto the floor or walls." (CA Food Sanitation Act)**
- **Hands should be washed after eating, smoking or touching mouth**



Skin

Problem

- Skin pathogens:
  - Pimple, cuts, infected wounds, sores on the body
    - Amplify pathogens
- Easily transferred to food

Solution

- Cover lesion with a dry, tightly fitting, impermeable bandage
- Cover bandage with clean glove
- Avoid contact with food or food contact surfaces

Hands

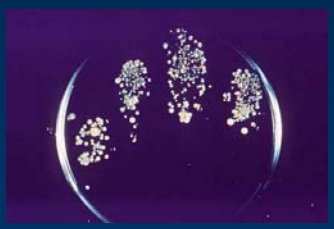
Problem

- Hands can transfer microorganisms or chemicals, medicines applied to skin, to foods and food contact surfaces
- Long nails enhance the problem
  - "Nurses with acrylic nails had much higher levels of pathogens before and after handwashing"

Nurseweek, 1999

Solution

- Frequent handwashing
  - Appropriate glove use
- Prohibit acrylic nails
- Trim fingernails

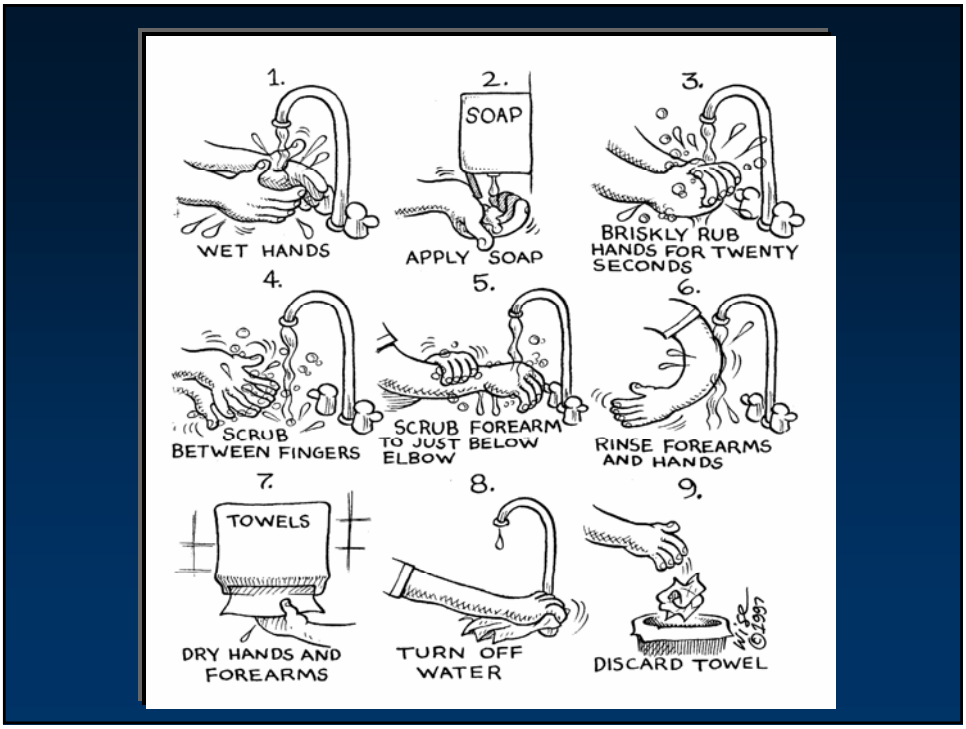


Dirty Fingers Touched to Agar

Reasons for not washing

- No time
- No way
- No need

Practice and Teach Proper Hand Washing



1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20

How Long Is 20 Secs ?

Proper Hand Washing

✓**Reduces GI-illness up to 80%**

Encouraging Good Hand Washing

ALPET E-3, Best Sanitizers, Inc.

- Handwashing stations
  - MUST be in or adjacent to restrooms
  - SHOULD be in food processing areas
  - Hot and cold running water (110°F)
  - Individual single-use towels
  - Adequate waste containers
  - Dedicated to hand washing


Clean Tech 2000S, Meritech

21 CFR Part 110.37 e

Restrooms

- Convenient
- Accessible
- Clean and maintained
- Well supplied including waste containers
- Construction materials
  - Durable
  - Easily cleaned
- Not used as a storage room

21 CFR Part 110.37 d

Plant Grounds

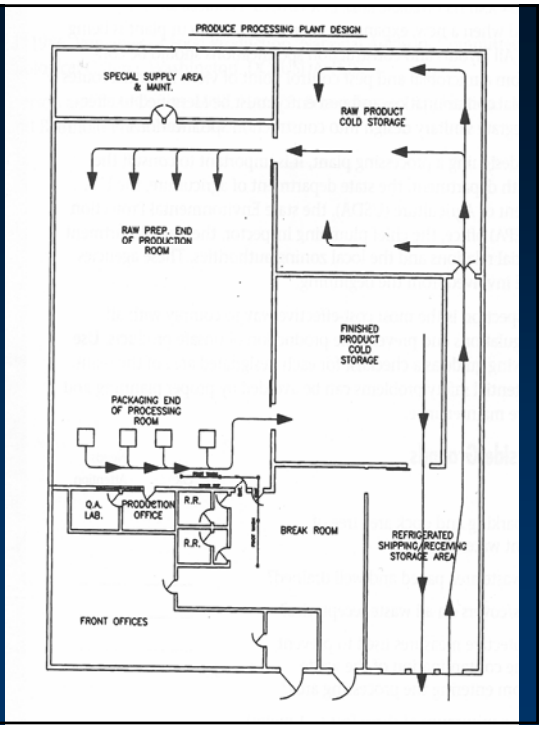
21 CFR Part 110.20

No Clutter - Equipment, Litter, Waste, Refuse

No Unpaved (Dusty) Roads

No Inadequately Drained Areas

Linear Product Flow To Prevent Cross Contamination



Sanitary Operations

21 CFR Part 110.35

- General Maintenance
- Storage of Sanitation Chemicals
- Pest Control
- Sanitation of Food - Contact Surfaces

Cleaning & Sanitizing

- Physical Debris Removal
- Rinse
- Detergent
- Post-rinse
- Sanitize

- Equipment or area specific procedure
- Qualified individual to set sanitation program

Master Sanitation Schedule

Area	Sanitation Method	Tool	Cleaning Materials	Frequency
Walls	Foam, Brush, Rinse	Soft Nylon Brush	Chlorine-quat based Cleaner	Once / Month
Floor	Wash, Rinse	Hard Bristle Broom, Hose	Chlorine-quat based cleaner	Daily

Standard Sanitary Operating Procedures

SSOP's

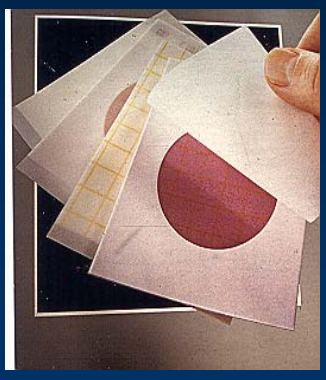
- **What: Identifies Task**
- **Why: Purpose of Task**
- **Who: Responsible Person**
- **How: Steps for completing the task**

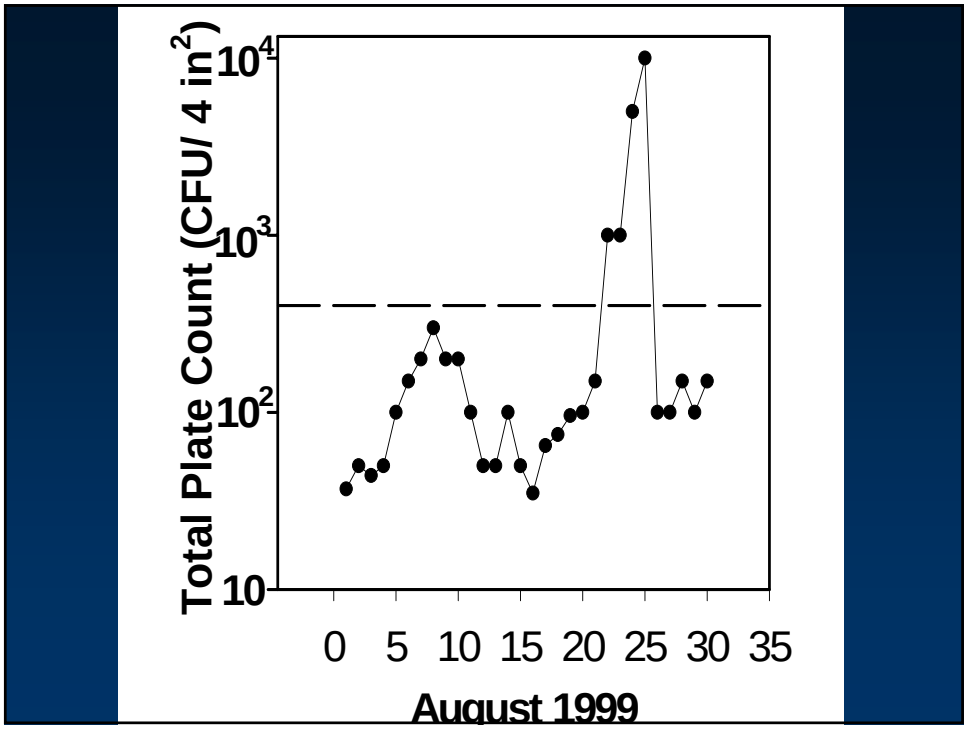
Cleaners & Sanitizers
Consult the Experts

- Chelators: e.g., EDTA
  - Tie up Cations
- Alkalines: e.g., NaOH,
  - Excellent Detergents
- Acids: e.g., phosphoric acid
  - Removes Mineral Deposits
- Wetting Agents: e.g., alkyl sulfates
  - Emulsify & Penetrate Soil
- Antimicrobials: e.g., chlorine, QUATS, iodine
  - Kill microorganisms

Monitoring Plant Sanitation

- Replicate Organism Direct Agar (RODAC)
- Contact Plates
  - Petri Contact Plates
- Surface Swabbing
- Surface Rinse Method
- ATP Bioluminescence





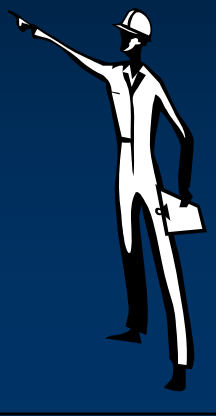
Sanitary Facilities and Controls

21 CFR Part 110.37

- Water Supply - Adequate and Sanitary
- Plumbing Adequate Size & Design
  - floor drains, separate sanitary sewers
- Toilet and handwashing

Management Responsibility CFR110.10

- "Shall" take all reasonable measures and precautions to ensure employee compliance with good hygiene.
  - Motivation, reinforcement, incentives
  - Serve as Role Models
  - Adhere to Visitor Policy



Management Responsibility

- Documented training programs
  - Initial training
  - Periodic reviews
  - Posted reminders are helpful
- Training should include
  - What is required
  - Why it is important

21 CFR Part 110.10 c

Hazard Analysis Critical Control Point HACCP

- Proactive and Preventive Approach to Food Safety
- ONLY Addresses Food Safety
- Covers All Phases of Food Production
- Covers physical, chemical and biological food safety hazards

HACCP Principles

1) Assessment of Hazards
2) Determine CCPs
3) CCP Limits
4) CCP Monitoring Procedures
5) Corrective Action Response
6) Record Keeping Systems
7) Procedures for HACCP Verification

HACCP Model

Flow Process	Hazard Category	CCP	Critical Limit	Monitoring	Freq.	Corrective Action	Record Keeping	Verification
Washing	Microbial	#3 Water Cl_2/pH	Free Cl_2 2-7ppm Total Cl_2 100-150 ppm pH:6.0-7.0	Test kit Continuous Strip Chart	3 times/ shift	Manually adjust water chemistry. Repair system. Hold product from last correct reading. Rewash	Chlorine/ pH records	Random Sampling. QA audit. Micro. Counts

Summary

- Foods and food contact surface must be protected from contamination
- Food handlers can be major sources of contamination if not properly trained
- Adequately maintained facilities and sanitation programs critical
- HACCP provides a systematic approach to food safety that is only possible when adequate GMPs are in place