Prerequisite
Programs
Yes, but take away the rodent droppings and the occasional shared of glass, and you’ve still got a damn fine product!
Why Have Prerequisite Programs

PREVENT PRODUCT ADULTERATION.
Prerequisite Programs

• Good Manufacturing Practices (GMPs)
• Sanitation Programs
  • In FSIS-inspected plants
    – Sanitation SOPs (SSOPs)
    – Sanitation Performance Standards
• Pest Management Programs
• These programs support HACCP
  so they’re called “Prerequisite Programs”
Relationship between HACCP & Prerequisite Programs

- GMPs
- Sanitation
- Pest Management
- OTHER
Programs to Insure Preventive Controls are Carried Out Adequately

- Training programs for managers and/or workers.
- Audits
- Written records,
- Validation of control measures
- Written sanitation SOPs
- Food label review and control program
- Testing of
  - in-coming raw materials,
  - in-process materials,
  - finished products
Why Have Food Safety Programs?

• Adulteration
  – “Prepared, packed, or held under insanitary conditions whereby it *may* have become contaminated with filth, or whereby it *may* have been rendered injurious to health”
Good Manufacturing Practices

GMPs
GMPs Defined

• Practices followed in manufacturing which are designed to prevent mistakes or accidents
• The main aim is to prevent
  – microbiological,
  – chemical, or
  – physical contamination of the finished product
GMPs – Management Responsibilities

• Furnish & maintain
  – A safe & clean work environment
  – Safe equipment & tools

• Establish & enforce work rules & conduct.

• Ensure supervisors have the competency to promote good sanitary practices
GMPs – Management Responsibilities

- Conduct sanitation & personal hygiene seminars
- Post signs (multilingual) to remind personnel & reinforce good practices
- Assign supervisors (not QA!) to monitor work-area entrances
GMPs Include

• Equipment selection & maintenance
• Plant environment
• Water sources
• Operational practices
• Storage procedures
• Protective equipment
GMPs Include

• Personnel Apparel
  – Exposed jewelry
  – Fingernail polish or artificial fingernails
  – Loose items in top pockets
  – Use of hair and beard nets
  – Footwear
  – Outer clothing
GMPs

- Employee personal hygiene
  - Eating
    - Chewing gum
    - Drinking
  - Using tobacco
  - Hand tools
GMPs

- Personnel Health
  - Disease control
    - Diarrhea or vomiting
    - Contagious diseases (including bad colds)
    - Open sores
  - Hand washing & sanitation
GMPs – Hand Hygiene

Pathogens & Hands

• Carriage varies with task
  – 12% of food workers + for *Listeria*
    • (11/12 washed hands inadequately)
  – *Salmonella*
    • on hands of 70 to 100% of slaughterhouse workers
GMPs – Hand Hygiene

• Proper hand-washing techniques
  – Use warm water & lather well for a minimum of 20 seconds
    • Typical duration < 10 sec. of hand washing
    • Remove some transient flora
    • Typically not resident organisms
    • Can remove 1.5 logs E. coli
    • May not remove all pathogens
  – Wash hands ASAP after contamination or efficacy drops
GMPs – Hand Hygiene

• Gloves & Food Handling
  – Gloves
    • RTE products
    • Protect the **product**
  – Wash **BEFORE** gloving
    • microbes will multiply inside warm, moist glove
  – Task segregation
    • A food handler **must not** handle trash
GMPs - Hand/glove dips

• Hand/glove sanitizing stations
  – Locations
    • outside
      – restrooms
      – break rooms,
      – entrances to processing areas
    • throughout RTE processing areas
  – Contain a properly formulated solution of sanitizer
    • Sanitizer strength monitored
Sanitation

SSOPs
SOPs

✓ Written
  ✓ Specific
  ✓ Step by step
  ✓ Sufficient detail
  ✓ Use descriptive action word
    • Active
      – Apply warm detergent solution (105 – 120 f) and scrub to remove soil
    • Passive
      – Warm detergent solution (105 – 120 f) will be applied and the equipment scrubbed.
SOPs

✓ Useable
✓ Monitored
✓ Documented
✓ SOP Name
  ✓ use code or number
✓ Identify the scope of the SOP
✓ What specifically is covered?
WHAT TO INCLUDE

- Detailed descriptions
- Specified frequency
  - Timing
- Sequence
- Identify the employee
  - Task specific?
  - Supervisor role
WHAT TO INCLUDE

• Materials used where appropriate
• Descriptions of corrective actions
• Daily maintained records
• Safety or health considerations
• Expected outcomes
Sanitation’s SSOPs

• Integral part of every food process
• A fundamental requirement under the law
  – Mandated by USDA & FDA
9 CFR 416

All meat and poultry establishments are required to develop, maintain, and adhere to written sanitation standard operating procedures.
21 CFR 120.6

• Each processor shall have and implement a sanitation standard operating procedure (SSOP) that addresses sanitation conditions and practices before, during, and after processing. The SSOP shall address the 8 key areas of sanitation
Eight Key Sanitation Conditions & Practices

1. Safe Water
2. Food Contact Surfaces
3. Prevent Cross-Contamination
4. Maintain Hand washing & Toilet Facilities
Eight Key Sanitation Conditions & Practices

5. Protect Food from Adulterants
6. Proper labeling, storage & use of toxic compounds
7. Employee Health Conditions
8. Exclusion of pests
Sanitation’s Place in the Food Industry

Unsanitary facilities +
Poor food handling practices +
Poor personal hygiene =

Bacterial contamination and growth
SSOPs:
Roles & Responsibilities

Government Regulatory Agencies
• Inspectors will not permit operation of plant under insanitary conditions

• Regulatory action will be initiated in plants not having or following SSOPs
SSOPs: Possible Components

- “Dry clean-up” procedures
- Equipment break-down procedures
- Cleaning instructions for equipment
SSOPs: Possible Components

• Identify appropriate
  – cleaners & sanitizers,
  – concentrations,
  – contact times
  – rinsing requirements
  – directions for preparation
  – criteria for discarding used solutions
SSOPs: Possible Components

• Condensation
  – Monitoring
  – Removal

• Preparation for clean-up
Selecting The Proper Cleaner and Sanitizers
Consideration for Cleaning Solutions

- Choice of cleaner influenced by
  - Type of soil
  - Organic load
  - Water
    - Temperature
    - Hardness
    - pH value
Consideration for Cleaning Solutions

• Types of cleaner
  – Alkaline foams
    • fats
  – Acid foams
    • Remove inorganic soil or scale, mineral deposits, or rust
  – Sequesterants/suspending agents
  – Combination cleaner/sanitizer products
    • Usually less effective than cleaner & sanitizer applied separately
Consideration for Sanitizers

• **Steam or 180°F water** (temperature must be measured at the surface which is to be sanitized)
  + Broad-spectrum sanitizer
  + Somewhat effective in removal of fats
  – Expensive (cost to heat water)
  – Burn risk to personnel
  – Difficulties in maintaining temperature at equipment surface *(need 10+ seconds)*
  – If cleaning is inadequate, risk of biofilm formation
  – Lots of condensation
  – “Cooking” RTE equipment
Consideration for Sanitizers

• Chlorine
  + Inexpensive
  + Rapid-acting (~ immediate)
  + Broad spectrum (including spores)
    – Inactivated by organic matter
    – Dissipates rapidly
    – No residual
    – Corrosive
    – Carcinogenic breakdown products

• Good for: routine sanitization of clean equipment & surfaces when used in a rotation program with other sanitizers
Consideration for Sanitizers

• **Iodophors**
  + Relatively inexpensive
  + Rapid-acting (~ immediate)
  + Short-term residual activity (hours)
  + Relatively insensitive to organic matter
  + Non-corrosive
  + Dissipates slowly
    – Discolors some materials
    – Incompatible with wastewater treatment systems

• Good for: hand dips, boot dips
Consideration for Sanitizers

- Quaternary ammonium compounds ("quats")
  - Insensitive to organic matter
  - Non-corrosive
  - Residual activity
    - Expensive
    - Slow-acting (many common quats need a minimum of 15 to 30 minutes contact time)
Quats

• Good for:
  – Periodic use on equipment when used in a rotation program with other sanitizers
  – Foaming onto walls, ceilings, & other non-food contact surfaces
  – Fogging
  – Killing mold
Consideration for Sanitizers

• Specialty sanitizers
  – Acid-based
  – Hydrogen peroxide-based
    • Good at inactivating spores
    • Environmentally safe (breaks down to oxygen & water)
    • Assists in residue removal
Consideration for Sanitizers

– Peroxide combinations (e.g. Oxonia active)
  • Environmentally safe (breaks down to water, oxygen, and acetic acid)
  • Assists in residue removal

– Chlorine dioxide chemistry (e.g. Oxine)
  • Expensive
  • Stable
  • Insensitive to organic matter
  • Non-corrosive
Consideration for Sanitizers

• Maximum permitted use levels on food-contact surfaces without rinsing
  – Chlorine: 200 ppm
  – Iodophors: 25 ppm
  – Quats: 200 ppm

• Higher levels may be used
  – On non-food contact surfaces
  – If rinsed after contact time passes

• Monitor sanitizer concentration
Special Problems – Sanitation

• Equipment
  – Grease-packed bearings

• Construction
  – Difficulty in disassembly

• Cleaning aids (scrubbies, etc.)
  – Should not be swapped between rooms (especially Raw & RTE areas)
Special Problems – Sanitation

• Biofilms
  – Resistant to sanitizers
  – Mechanical action + detergent + warm water necessary for removal
  – May result from improper cleaning practices
  – May harbor pathogens & sporadically “seed” equipment and/or product with pathogens
Biofilm = Food gunk + Minerals + Bugs

- **Mineral (Iron, Calcium)**
- **Microorganisms**
- **Food debris**

Biofilm is a prime *Listeria* hiding place!
Pest Management
To be effective, must go beyond Pest Control to Pest Management
Pest Management

• Should be:
  – Preventive
  – Based on Integrated pest management philosophy
  – Administered by a licensed, certified, reputable Pest Control Officer on a regular basis
  – Included under GMPs or Sanitation program
  – Well documented
Pest Management Goals

• Prevent contamination
  – by pests
  – chemicals used in their control
• Keep pests out of the facility
  – deprive pests of food, water, and shelter
Pest Control Officers

• Licensed, certified & reputable PCO
• Regularly-scheduled service
  – Should assess situation & recommend an Integrated Pest Management approach
  – Works when food is NOT being prepared
  – Provides emergency service
Pest Control Officers

• Ask about
  – Professional memberships
  – Ongoing education/training
• Insure he insures his work
• Plant personnel accompany PCO
Common Pests

• Main concern is carriage of pathogens
• Cockroaches
  – Can live up to 2 years
  – Leave signs of infestation
• Flies
• Other insects (including moths, ants, beetles)
• Rodents
• Birds
• Other animals (e.g. cats, snails)
Major Causes of Pest Problems

• Poor
  – housekeeping practices
  – garbage handling & disposal practices
  – maintenance of buildings & grounds
  – food storage practices

• Incoming materials & supplies
Pest Prevention Measures

• Store food & supplies properly
  – 6 inches off the floor & 6 inches away from the wall
  – humidity of dry storage areas at 50% or less
  – Rotate stock & practice FIFO (First In, First Out)

• Dispose of cleaning water

• Clean & sanitize operation thoroughly
Pest Prevention Measures

• Maintain building & grounds
  – Periodically clean & sanitize dumpsters
Pest Prevention Measures

• “Insect attractors”
  – Install in proper location
    • At least 5 feet from food preparation areas
    • 3 to 5 feet above the floor
    • insects’ flight path
  – Devices retain insects
    • clean regularly
    • Splatter can spread pathogens
  – Check bulbs regularly
Use of Pesticides

• **No substitute** for good sanitation & facility maintenance

• Pesticides are a potential hazard & their use is regulated
  – Have certified PCO do application
  – Usage records must be kept

• Store pesticides in original containers in a locked cabinet **separate** from cleaners & sanitizers
Pest Management Documentation

• Current copy of PCO & contractor certification
• Map of rodent stations, bait stations, insect zappers
  – Periodically audit against reality
Pest Management Documentation

• Maintenance schedule for stations, attractor bulbs, etc.

• If pesticides permitted to be stored on site
  – List & inventory of pesticides with labels & MSDS
  – SOP for pesticide application by in-house personnel (if permitted)
Pest Management Documentation

• Report of PCO inspection findings & Corrective Actions
• Report of in-house inspections or pest sightings with Corrective Actions
• Report of physical assessment of the plant & Corrective Actions
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- Other