

# Principle 3

Setting Critical Limits

# Principle #3 - Critical Limits

## Critical Limits

- Specification that indicate whether an operation is in control at a particular CCP for a specific hazard.
- Possible to have more than one Critical Limit at a particular CCP (e.g. for different types of hazards)

# Critical Limit - definition

- A maximum and/or minimum value to which a biological, chemical, or physical parameter must be controlled at a CCP to prevent, eliminate, or reduce to an acceptable level the occurrence of a hazard

# Critical Limits -Examples

- Time (chilling of cooked products must begin within 90 minutes after end of cook cycle – USDA-FSIS App. B Compliance Guidelines)
- Temperature (minimum internal temperature of 155°F with cured, smoked turkey ham – USDA-FSIS App. A Compliance Guidelines, 3/99)

# Critical Limits - Examples

- **Chlorine level** (150 to 200 ppm free Chlorine in bath for packaged RTE going into Clean Room)
- **Presence of a Testing Declaration** for *E. coli* O157:H7 indicating “*not detected*” in 100 g sample of a lot of incoming boneless beef using screening test meeting FSIS performance requirements

# Critical Limits - Examples

- **Time & temperature**
  - Hold hot foods at or above 140°F till served  
[21CFR 110.80(b)(3) or 2001 Food Code 3-501.16]
  - < 1,000 “Degree-hours” when sausages fermented between 90 & 100°F (AMI GMPs)
- **FSIS “zero-tolerance” for fecal contamination on carcasses**

# Sources of Critical Limits

- Scientific publications
  - Journal articles
  - Food Microbiology or Food Science texts
- Predictive modeling programs
- Regulations or regulatory guidelines (USDA, FDA, State agencies)
  - FSIS Appendix A Compliance Guidelines for cooking (3/99)
  - FSIS Appendix B Compliance Guidelines for cooling (6/99)

# Sources of Critical Limits

- **Experts**
  - NACMCF
  - Consultants (food scientists, microbiologists)
  - University extension personnel
  - Sanitarians
  - Equipment manufacturers
- **Experimental studies**
  - External labs
  - In-house experiments

# Selection of Critical Limits

- Absolutely critical!
- Must
  - be tied to food safety
  - be scientifically supportable
  - be attainable in a controlled process producing safe product
  - consider sensitivity of monitoring device

# Action Limits

- “Action Limits” which are more strict than Critical Limits &, thereby, reduce risk of a deviation
  - When Action Limit is exceeded, take action & record information. That’s not a deviation!

# Critical Limit vs. Action Limit

- Critical Limit for carcass hot water cabinet is 185°F at carcass surface, monitored once per “clock hour”
- Action Limit is 190°F at carcass surface, monitored on every 20<sup>th</sup> carcass with a temperature-indicator tape

# Critical Limits Ex. #1

- Process: preparing hamburger sandwiches
- Hazard: biological, specifically microbial pathogens (e.g. *E. coli* O157:H7, *Salmonella*)
- CCP: cooking hamburger patties in a fryer
- Critical limits
  - Patty must not be frozen
  - Minimum fryer oil temperature of 350°F (176.7°C)
  - Maximum patty thickness of 1/4 inch (0.64 cm)
  - Minimum cook time in the oil of 1 minute