HACCP Principle 2 – Identify Critical Control Points

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HACCP Principles

• Principle 2
  – Identify the **Critical Control Points (CCPs)** in the process.
  – The “**Stop Sign**” of the process.
Definition

Critical Control Point

A point or step at which control can be applied and is essential to prevent or eliminate a food safety hazard or reduce it to an acceptable level.
Hazard Prevention

• Points may be identified as CCPs when hazards can be prevented
  – For some products and processes the following may be true:
    • Introduction of hazard can be prevented by control at receiving step (e.g. supplier declaration)
    • A chemical hazard can be prevented by control at ingredient addition or blending step
Hazard Prevention

• Points may be identified as CCPs when hazards can be prevented
  – Pathogen growth in the finished product can be prevented by control at formulation or ingredient addition step (e.g. pH adjustment or addition of preservatives)
  – Pathogen growth can be controlled by refrigerated storage or chilling
Hazard Elimination

• Points may be identified as CCPs (or oPRPs) when hazards can be eliminated
  – For some products and processes the following may be true:
    • Pathogens and parasites can be killed during heat treatment or UV light treatment
    • Metal fragments can be detected by a metal detector and eliminated by removing the contaminated product
Hazard Reduction

• Points may be identified as CCPs when hazards are reduced to acceptable levels
  
  – For some products and processes the following may be true:
    
    • Occurrence of foreign objects can be minimized by manual sorting and automatic collectors
    
    • Some chemical hazards such as patulin can be reduced by processes such as culling, brushing and washing apples prior to juice extraction
Assessment of Control Measures

• Identify control measures or combination of control measures capable of preventing, eliminating or reducing these food safety hazards to acceptable levels.

• Review each of the control measures with respect to its effectiveness against the identified food safety hazards.

• Categorize control measures as to whether they are managed by Prerequisite Programs, or need to be managed through the HACCP plan.
Critical Control Points

• There likely are several points in a food processing system where hazards can be controlled to some extent.

• There are likely to be only a few steps where loss of control will result in the production of a potentially unsafe food.

  — These steps are the CCPs in the HACCP Plan
Determining CCPs

• CCP Decision Trees
  – The HACCP team should use the CCP Decision Tree to evaluate each of the steps where food safety hazards can be prevented, eliminated, or reduced to acceptable levels.
  – Each step should then be categorized as either a CCP, control point or neither
CCP Decision Trees – Example

DIAGRAM 2
EXAMPLE OF DECISION TREE TO IDENTIFY CCPs
(answers questions in sequence)

Q1: Do control preventative measure(s) exist?
   - Yes
   - No
   \[\text{Is control at this step necessary for safety?}\]
   \[\text{Yes}\]
   \[\text{No} \rightarrow \text{Not a CCP} \rightarrow \text{Stop (*)}\]
   \[\text{Modify step, process or product} \rightarrow \text{Yes}\]

Q2: Is the step specifically designed to eliminate or reduce the likely occurrence of a hazard to an acceptable level? (*)
   \[\text{Yes}\]
   \[\text{No}\]

Q3: Could contamination with identified hazard(s) occur in excess of acceptable level(s), or could these increase to unacceptable levels? (*)
   \[\text{Yes}\]
   \[\text{No} \rightarrow \text{Not a CCP} \rightarrow \text{Stop (*)}\]

Q4: Will a subsequent step eliminate identified hazard(s) or reduce likely occurrence to an acceptable level? (*)
   \[\text{Yes}\]
   \[\text{No} \rightarrow \text{Not a CCP} \rightarrow \text{Stop (*)}\]

(*) Denote to the next level (*)
Determining CCPs

• Do NOT use the CCP Decision Tree before completing the hazard analysis.
  – This may result in identifying CCPs that are not essential to controlling product safety

• Strictly following a CCP Decision Tree sometimes results in a decision that common sense says is incorrect.
  – Use decision trees with caution.
Multiple CCPs and Hazards

• A single hazard may require control by multiple CCPs
  – Example: Acidification and thermal processing of fruit purees to control *Clostridium botulinum* growth and toxin formation.

• Multiple hazards may be controlled by a single CCP
  – Example: Vegetative pathogenic bacteria and parasites in apple juice can be controlled by the same thermal process.
CCPs are Product- and Process-Specific

• CCPs may change with differences in:
  – Facility layout
  – Formulation
  – Process flow
  – Equipment
  – Ingredient selection
  – Sanitation and other prerequisite programs
Critical Control Points

• Points of absolute control

• Steps in the food process which must be under control to produce a safe product

• CCPs are an intervention used when the hazard has a high probability of existing and the risk level to the consumer is high.
ISO 22000 Food Safety Schemes

• Also include the concept of Operational Prerequisite Programs (oPRPs)
  – A prerequisite program identified by the hazard analysis as essential in order to control the likelihood of introducing food safety hazards to and/or the contamination or proliferation of food safety hazards in the product(s) or in the processing environment.
Prerequisite Programs

- The **generic** controls in any type of food operation.
- Applied in all types of food operations so as to maintain a **hygienic environment** to reduce the food safety risk.
- They are in operation at **all times**.
- They are the **foundation** of HACCP.
- They can have an effect on end product safety if not included in the food safety management system.
- They are **NOT** specific to one step in the process and **DO NOT CONTROL** a specific hazard.
Operational Prerequisite Programs

• oPRP are **specific** to a food operation and are determined after doing the hazard analysis.

• oPRP are **essential** because the hazard analysis has shown that they are necessary to control **specific** food safety hazards.

• oPRP may not target a specific source of the hazard.

• oPRP are used to **reduce the likelihood** that products and/or processing environment will be exposed to hazards or will be contaminated and that hazards will proliferate.
What Differentiates an **OPRP** from a **PRP**?

- **PRPs** are horizontal
- **PRPs** may contribute to reduction of the hazard but may not be essential for control
- **OPRPs** apply to a specific identified hazard
- **OPRPs** apply to a specific product or process
- **OPRPs** are essential to reduce the level of the hazard
- Example: General cleaning and sanitation (PRP) versus cleaning of a particular point in the line to prevent allergen cross-contamination (OPRP)
What Differentiates an **OPRP** from a **CCP**?

- **CCPs** are process steps where control measures are applied that have “absolute” control over the hazard.

- **OPRPs** are control measures essential for the control of the hazard, but do not have “absolute” control over the hazard.

- **OPRPs** may work in combination with other control measures to prevent, eliminate, reduce or maintain a hazard to an acceptable level.
  - Their failure does not automatically imply that a product is hazardous.
Designating CCPs

• Methods for identifying or designating CCPs in HACCP plans can vary:
  – Sequential numbering
    • CCP #1, CCP #2, CCP #3
  – Sequentially within hazard category
    • CCP P1, CCP B1, CCP C1
  – By process step name
    • Oven, Packaging, Chill
Number of CCPs in a Plan

• Depends on the product and process.
• Too few CCPs may not allow for adequate control of food safety hazards.
• Too many CCPs may over burden the HACCP plan.
  – It is more common for establishments to designate too many CCPs than too few.
  – If everything is significant, then NOTHING is significant.
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