WHO/EMRO, Smarter Futures, IFSBH, Flour Fortification Initiative

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Hazard Analysis and Critical Control Points

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Hazard Analysis and Critical Control Points
An Overview

H: Hazard
A: Analysis
C: Critical
C: Control
P: Point
WHAT IS HACCP?

 추진 관리 점검 절차 (HACCP)는 음식 제조 현장에서 물리적, 화학적 또는 生物학적 위험을 식별하고 방지하는 데 기반한 제조 과정 관리 시스템입니다.

 HACCP는 문제들이 발생하기 전에 방지하고,发现问题时即刻纠正的步骤。

 HACCP includes steps to prevent problems before they occur and to correct problems as soon as they are detected.
WHAT ARE THE BENEFITS OF HACCP?

HACCP significantly improves the safety of food.

HACCP reduce product waste and operating costs while increasing awareness of potential food safety hazards among production employees.

HACCP provides for record keeping and documentation of evidence in the event of litigation involving food production.

Principles of HACCP

Bay West can be a valuable part of any HACCP plan.
The Seven Steps (Principles) in a HACCP System

1. Conduct a hazard analysis
2. Identify the critical control points (CCPs)
3. Establish critical limits
4. Establish procedures to monitor CCPs
5. Establish the corrective action
6. Establish procedures to verify that the HACCP system is working effectively
7. Establish effective record keeping systems
1. Conduct Hazard Analysis

- This step involves identifying hazards that might be introduced to food

- Potential Hazards
  - Biological hazards
  - Chemical hazards
  - Physical hazards

- Examples of Biological Hazards
  - Spore-forming bacteria
  - Viruses
  - Non-spore-forming bacteria
  - Parasites
1. Conduct Hazard Analysis

Examples of Chemical Hazards
- Naturally occurring chemicals
- Added chemicals
- From packaging materials

Examples of Physical Hazards
- Glass
- Wood
- Stones
- Metal
- Insulating
- Bone
- Plastic
- Personal effects
1. Conduct Hazard Analysis

How to Conduct Hazard Analysis

The hazard analysis procedure includes five activities

- Review incoming material
- Evaluate processing operations for hazards
- Observe actual operating practices
- Take measurements
- Analyze the measurements
The hazard analysis activities

Evaluate processing operations for hazards:

- The objective of this activity is to identify the potential hazards related to each processing operation.
- This can be accomplished by reviewing the process flow diagram and plant schematic or floor plant.
- The hazards identified should be fully described.
The hazard analysis activities

Observe actual operating practices

The HACCP team should be familiar with every detail of the operation and record the hazard materials

The HACCP team shall
1. Observe the operation
2. Observe the employees
3. Observe the hygienic practices and note the hazards
4. Analyze if there is a kill step (process which destroys all microorganisms) during the process
The hazard analysis activities

Take Measurements

- Take measurements of important processing parameters
- Devices should be accurate

Example of measurements

1. Measure product temperature (heat and cool process)
2. Measure time/temperature (drying, cooking, pasteurization, canning)
3. Measure pressure (head space)
4. Measure the pH (during processing, end product)
5. Measure Aw of the product (dry products)
2. Identify Critical Control Points (CCPs)

A Critical Control Point is an operation in the flow of the food which will prevent, eliminate or reduce hazards to acceptable levels.

Examples of CCPs:
- Cooking
- Reheating
- Hot holding
- Chilling
- Chilled storage
- Receiving
- Thawing
- Mixing ingredients
- Drying

Critical Control Point Decision Tree
Q1. Does this step involve a hazard of sufficient risk to warrant its control?
   - yes
   - no → not a CCP

Q2. Does a preventive measure for the hazard exist at this step?
   - Yes
   - no → Is control at this step necessary for safety?
     - yes
     - no → not a CCP
     - Modify the step, Process, or product

Q3. Is control at this step necessary to prevent or reduce the risk of the hazard to consumers?
   - yes → CCP
   - no → not a CCP
3. Establish the Critical Limits

Critical Limits are defined as criteria that separate acceptability from unacceptability.

Critical limit represents the boundaries that are used to judge whether an operation is producing safe products.
4. Establish Procedures to Monitor CCPs

To monitor CCPs, make observation and measurements to determine whether a critical control point is under control.

Example: monitoring tells you whether or not the internal temperature of ground beef has reached 68°C or above for 15 seconds.

Time, temperature, pH, and $a_w$ are the critical limits most commonly monitored.
5. Establish the Corrective Action

If the critical limit was exceeded during the production of a HACCP monitored food, correct the problem immediately.

The flow of food should not continue until all CCPs have been met.
6. Establish Procedure to Verify that the HACCP System is Working

The verification process consists of two phases

1. You must verify that the critical limits established for each CCP will prevent, eliminate, or reduce hazards to acceptable levels

2. You must verify that the overall HACCP plan is functioning effectively
7. Establish Effective Record Keeping

An effective HACCP requires **written** HACCP plan.

The plan should provide information about the **hazards** associated with the food, identify each **CCP**, the **critical limits**, and the procedure of **monitoring**.

Keep enough records to prove that the **system** is working effectively.
Assemble the HACCP team

Team Composition:

When selecting the team, the coordinator should focus on:

- Those who will be involved in hazard identification
- Those who will be involved in determination of CCPs
- Those who will monitor CCPs
- Those who will verify operations at CCPs
- Those who will examine samples and perform verification procedures
Assemble the HACCP team

Knowledge required:
Selecting personnel should have a basic understanding of
- Technology and equipment used on the processing lines
- Practical aspects of the food operations
- The flow and technology of the process
- Applied aspects of food microbiology
- HACCP principles and techniques
Flow diagram:

The flow of raw materials from the point at which they enter the plant, through processing to departure
A plant schematic must be developed, to show product flow and employee traffic patterns within the plant for the specific product.

The diagram should include the flow of all ingredient and packaging materials from the moment they are received at the plant, through storage, preparation, processing, packaging, finished product holding and shipping.
The ISO 22000 family contains a number of standards each focusing on different aspects of food safety management.
ISO Certifications

- ISO 22000:2005  Food Safety Management
- ISO/TS 22004  Guidelines for applying ISO 22000
- ISO 22005:2007  Traceability in the feed and food chain
- ISO /TS 22002-1:2009  Specific prerequisites for food manufacturing
- ISO/TS 22003:2007  Guidelines for audit and certification bodies
THANK YOU

QUESTIONS AND COMMENTS