

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

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# HACCP

## Hazard Analysis and Critical Control Points

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# HACCP

## Hazard Analysis and Critical Control Points

### An Overview

H: Hazard

A: Analysis

C: Critical

C: Control

P: Point

# WHAT IS HACCP?

❁ Hazard Analysis Critical Control Point

❁ (HACCP) is a process control system designed to enhance food safety by identifying and preventing physical, chemical or biological hazards in food production.

❁ 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 plan**
- 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  $A_w$  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 CCP<sub>s</sub>**

|          |                    |             |
|----------|--------------------|-------------|
| Cooking  | Reheating          | Hot holding |
| Chilling | Chilled storage    | Receiving   |
| Thawing  | Mixing ingredients | Drying      |

### ■ **Critical Control Point Decision Tree**

# 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?**

Modify the step,  
Process, or product

Yes

no

Is control at this step necessary for safety?

yes

no → not a CCP

**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 CCP<sub>s</sub>

- To monitor CCP<sub>s</sub>, 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<sub>w</sub> 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 CCP<sub>s</sub> 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<sub>s</sub> 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 CCP<sub>s</sub>
- Those who will monitor CCP<sub>s</sub>
- Those who will verify operations at CCP<sub>s</sub>
- 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

# Construct flow diagram

## Flow diagram:

- The flow of raw materials from the point at which they **enter** the plant, through processing to **departure**

# Construct flow diagram

## Plant schematic:

- 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**

# **ISO 22000 - Food safety management**

ISO (International Organization for Standardization)

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**