



Chemical Quality Assurance (DTC- 311)



HAZARD ANALYSIS AND CRITICAL CONTROL POINTS (HACCP)

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Necessity of HACCP

There are many reasons for this :

- **Foodborne diseases**
- **An increase in the number of vulnerable people**
- **Industrialization and increased mass production**
- **Urbanization**
- **New food technologies and processing methods**
- **Changing lifestyles**
- **Increased worldwide tourism and international trade in foodstuffs**
- **Increased contamination of the environment.**
- **Increased consumer awareness of food safety.**
- **Lack of or decreasing resources for food safety.**

HACCP Terminology

a) Hazard

A biological, chemical, or physical agent that is reasonably likely to cause illness or injury in the absence of its control.

b) Contamination

Exposure of food products to hazards, which can cause illness, disease, or even death.

c) Control (verb)

To take all necessary actions to ensure and maintain compliance with criteria established in the HACCP plan.

d) Control (noun)

The state wherein correct procedures are being followed and criteria are being met.

e) **Control measure**

Any action and activity that can be used to prevent or eliminate a food safety hazard or reduce it to an acceptable level.

f) **Corrective action**

Any action to be taken when the results of monitoring at the CCP indicate a loss of control.

g) **Control Point**

Any step at which biological, chemical, or physical factors can be controlled.

h) **Critical Control Point (CCP)**

An **Essential Point** at which **Control can be applied** so that => a Food Safety Hazard can be **PREVENTED, ELIMINATED, or REDUCED** to an Acceptable Level.

It is the **last step** in the flow of food where a hazard can be controlled.

i) Critical Limit

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 food safety hazard.

j) Deviation

Failure to meet a critical limit.

k) Flow diagram

A systematic representation of the sequence of steps or operations used in the production or manufacture of a particular food item.

l) HACCP (Hazard Analysis Critical Control Point)

A system designed to identify, evaluate, and control of the potential food safety hazards.

m) HACCP Plan

The written document to describe the procedures based on the principles of HACCP and specific conditions.

n) Risk

Probability that conditions will lead to a hazard.

o) Prerequisite Programs

Procedures, including Good Manufacturing Practices that address operational conditions providing the foundation for the HACCP system.

p) Monitor

To conduct a planned sequence of observations or measurements to assess whether a CCP is under control and to produce an accurate record for future use in verification.

q) Corrective Action

Procedures followed when a deviation occurs.

r) Step

A point, procedure, operation or stage in the food chain including raw materials, from primary production to final consumption.

s) Validation

Obtaining evidence that the elements of the HACCP plan are effective.

t) Verification

Those activities, other than monitoring, that determine => **validity of the HACCP plan** and that the system is operating according to the plan.

What is Hazard?

- It is the potential to cause **harm to the consumer** (the safety aspect) or **the product** (spoilage aspect).
- The hazard associated with food safety can be of
 - ❖ **Physical** (extraneous matter),
 - ❖ **Chemical** (pesticides, insecticides, radionuclides, carcinogenic components, allergens) and
 - ❖ **Biological** nature (pathogens, microbial toxins).

Classification of hazards

Based on process and basic ingredients hazards can be **classified** as :

- A food product containing **sensitive ingredient**
- Manufacturing process does not contain **controlled processing step**
- There is substantial potential for abuse in **distribution or in consumer handling**

On the basis of classification, with different combinations of hazard class, as positive (+) or no hazard as (0) is designated and then it is categorized as:

Category 1

Special category for products meant for **sensitive consumers** like baby foods.

Category 2

Which contain **either of two hazards** as given above

Category 3

When **one hazard** is present

Category 4

When **no hazard** is present

The probability that a hazard will be realized is called **risk** and is assessed as **low, medium, high**, it is identified by three modes.

Failure modes effect analysis

Applied to the **process** and includes **systematic listing of each step of the process** and then => listing every mode of failure of these steps that can affect the **quality of the end product**.

Fault trees

Fault which may occur in the **final product is stated** and => each **process step** involved in manufacturing that product is **identified** with reference to its **relevance** in causing the stated fault.

Delphi technique

A group of experts from **different disciplines** arrive at a consensus regarding => **risk attached to a process or a product** => done through **questionnaire** circulated to process workers followed by => **discussion** on the answers by **group of experts** and until an **informed decision is reached on the risks involved**.

Types of Hazard:

❖ Physical hazard

- Hairs • Stones • Stems and seeds • Bones fragments and feathers
- Matchsticks • Jewellery • Nails nuts and bolts • Buttons • Bidis and cigarettes.

❖ Chemical hazards

- Cleaning agents • Adulterants • Excess of permissible additive • Non permissible additive • Veterinary residue • Pesticides residue

❖ Biological hazards

1. Invisible : Bacteria • Yeast • Protozoa • Molds • Viruses

2. Visible : Fly • Worms • Cockroaches • Caterpillars • Weevils

Principles of HACCP :

HACCP is based around **seven established principles**.

Principle 1 - Conduct a hazard analysis

Principle 2 - Identify critical control point (CCP)

Principle 3 - Establish critical limits for each CCP

Principle 4 - Establish CCP monitoring requirements


Principle 5 - Establish corrective actions

Principle 6 - Establish record keeping procedures

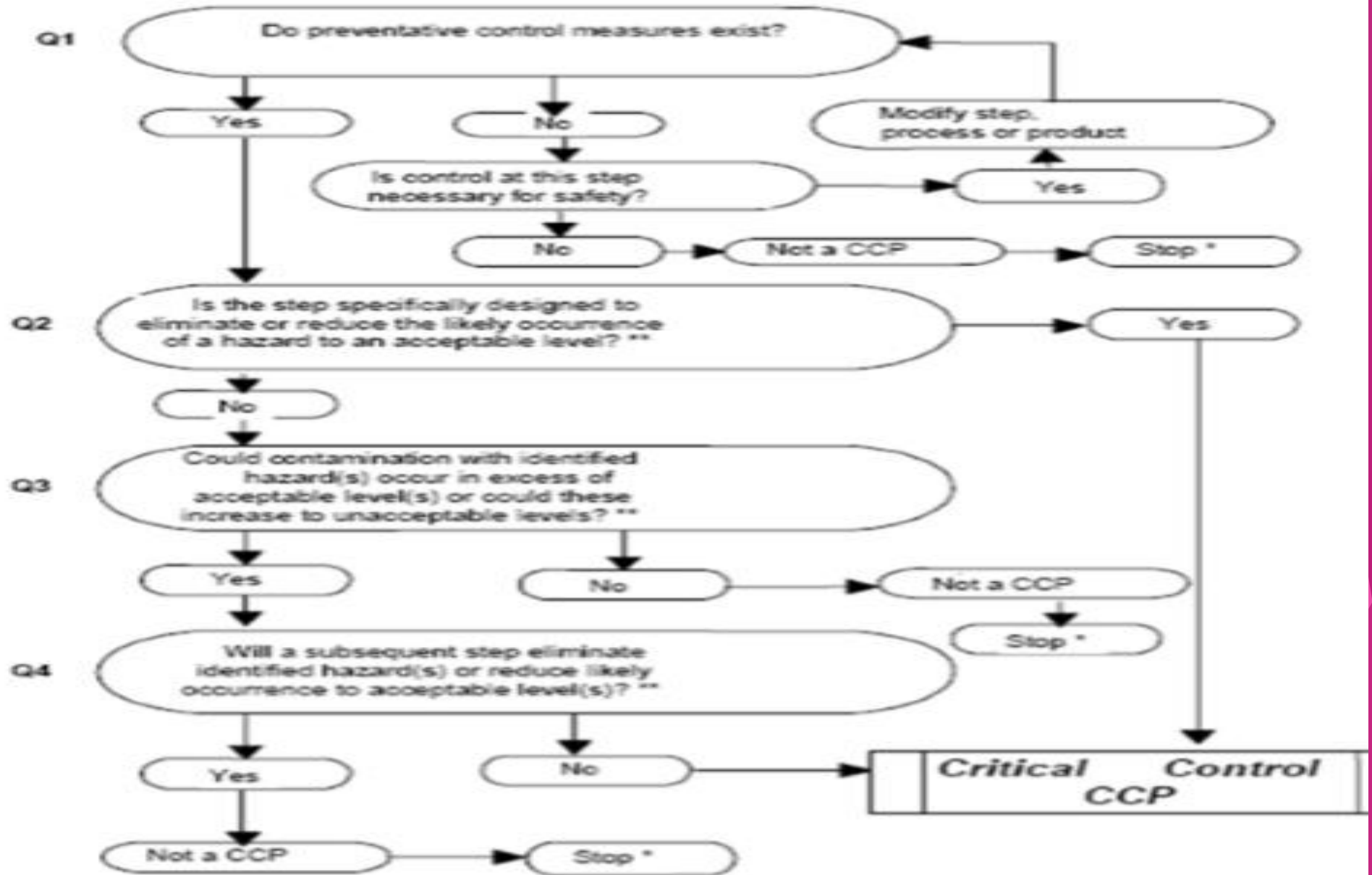
Principle 7- Establish record keeping procedures the HACCP system is working as intended

Implementation of HACCP

- HACCP is a system that assists organizations to => identify **potential food safety hazards in the entire food supply chain** and to take => **preventive measures** for their control.
- HACCP focuses on the **prevention of hazards** rather than relying on end product testing.
- Sequence of **12 steps**, included in the guidelines => developed by the **Codex Committee** on **Food Hygiene**, is the recommended approach to develop a **HACCP programme**.

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- Step 1 - Assemble HACCP team**
 - Step 2 - Describe product**
 - Step 3 - Identify intended use**
 - Step 4 - Construct flow diagram**
 - Step 5 - On-site confirmation of flow diagram**
 - Step 6 - List all potential hazards associated with each step, conduct a hazard analysis, and consider any measures to control hazards**
 - Step 7 - Determine critical control points (CCPs)**
 - Step 8 - Establish critical limits for each CCP**
 - Step 9 - Establish a system of monitoring each CCP**
 - Step 10 - Establish corrective actions**
 - Step 11 - Establish verification procedure**
 - Step 12 - Establish documentation and record keeping**

EXAMPLE OF DECISION TREE TO IDENTIFY CCPS



* Proceed to the next identified hazard in the

** Acceptable and unacceptable levels need to be determined within the overall objectives in identifying

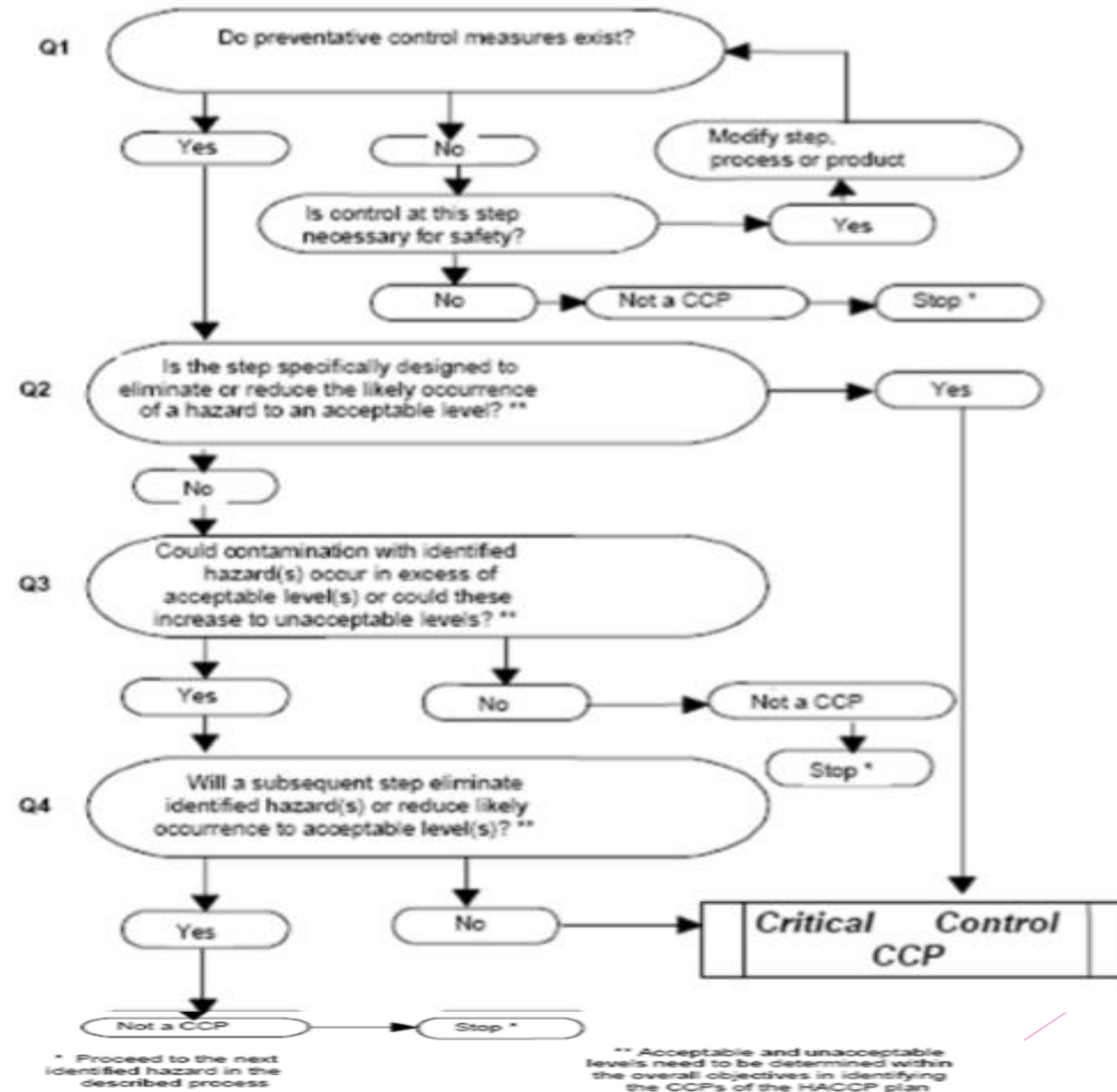


Fig. 2.2 Example of HACCP worksheet

The background features abstract, overlapping geometric shapes in various shades of pink and purple, creating a modern, layered effect. The shapes are primarily triangles and polygons, some with soft gradients and others with solid colors. The overall composition is clean and contemporary.

THANKS