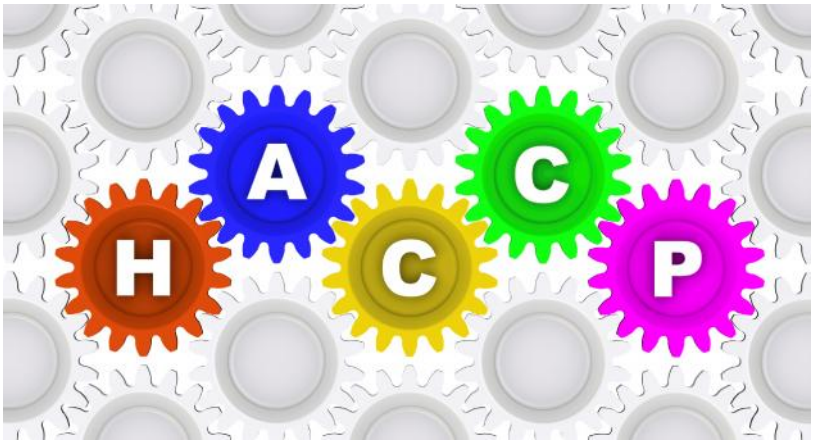
HACCP Principles



A webinar presented by:

Dr Andy Bowles

Attendee Notes

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The Principles of HACCP

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Re-cap: Preparing a HACCP

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Preparing a HACCP

- Two key issues:
  - Pre-requisites to HACCP
  - First steps in preparing a HACCP

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Pre-requisites to HACCP.

- Before starting a HACCP study you should consider the "pre-requisites".
- Pre-requisites provide the basic environment & operating conditions and are essential for a successful HACCP.
- Prerequisites can be based on:
  - Legal requirements
  - Good Hygiene Practice
  - Good Manufacturing Practice
  - Codex Alimentarius General Principles

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Examples of pre-requisites

- Pre-requisite issues include:
  - Layout and design of food premises
  - Structure and condition of food premises
  - Food allergen control
  - Supplier control
  - Storage and transport
  - Equipment
  - Personal hygiene
  - Temperature control
  - Training
  - Cleaning
  - Pest control
  - Waste control
  - Product withdrawal

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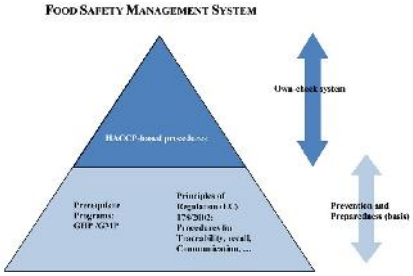
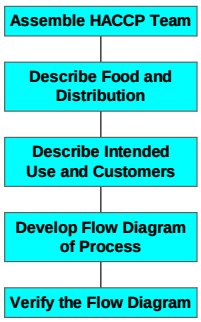
Pre-requisite programmes (PRPs)



- Relationship between PRP and HACCP
  - Source: Commission Notice (2016/C 278/01) on the implementation of food safety management systems covering prerequisite programs (PRPs) and procedures based on the HACCP principles, including the facilitation/flexibility of the implementation in certain food businesses

Preparing a HACCP – First Steps



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The Seven Principles of HACCP

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Codex seven principles

- Conduct a Hazard Analysis
- Determine the Critical Control Points
- Establish Critical Limits
- Establish monitoring procedures
- Establish corrective actions
- Establish verification procedures
- Establish record keeping and documentation

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Principle 1
Conduct a Hazard Analysis

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Principle 1

- ***Conduct a Hazard Analysis***
- ***Two stage process:***
  1. Identify significant hazards that are:
     - Reasonably likely to occur
     - Likely to cause illness/injury if not controlled
  2. Identify appropriate control measures for each significant hazard.

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Principle 1: In practice

- Hazard identification
  - List out possible hazards (long list)
    - Specific to food
    - Consider
      - Intrinsic factors
      - Extrinsic factors

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Principle 1: In practice

- **Intrinsic** factors of food
  - Factors that might promote/control pathogen growth
    - pH, aw, salt content etc
  - Normal micro flora of food

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Principle 1: In practice

- **Extrinsic** –
  - Temperature
  - Humidity

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Principle 1: In practice

- Review process operations for hazards
  - Examine each step of flow diagram
  - Consider any hazards that might occur
  - For micro hazards consider
    - Presence
    - Introduction (direct & cross contamination)
    - Multiplication
    - Survival

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Principle 1: In practice

- Microbiological hazards
  - Microbiological Criteria of Foodstuffs Regulation
    - Regulation (EC) 2073/2005

Microbiological Criteria of Foodstuffs

- FBO must take measures as part of HACCP together with implementation of good hygiene practice to ensure:
  - Process hygiene criteria met
  - Food safety criteria met
    - Under ***reasonably foreseeable*** conditions of:
      - Distribution
      - Storage and
      - Use
- As necessary "conduct studies" in Annex II

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Principle 1: In practice

- Evaluation of hazards
  - Hazards quantified in terms of:
    - Severity
    - Likely occurrence
  - Need to consider:
    - Long term/ short term effects of exposure to hazard
  - Should document discussions and conclusions for future reference
  - Production of 'short list'
  - May use "risk quadrant"

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Principle 1: In practice

- Evaluation of hazards
  - Hazards are quantified in terms of:
    - Severity (Effect)
    - Likely occurrence (Probability)

RISK LEVEL (R = P x E): SCALE 1 TO 7

PROBABILITY		1 Limited	2 Moderate	3 Serious	4 Very serious
High	4	4	5	6	7
Real	3	3	4	5	6
Small	2	2	3	4	5
Very small	1	1	2	3	4

EFFECT

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Principle 1: In practice

- All significant hazards should have been identified
- Controls identified for each of these hazards

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Principle 2

- ***Determine Critical Control Points (CCPs)***
  - CCP = Step where
    - control can be applied and is
    - Essential to prevent, eliminate or reduce hazard to an acceptable level.
  - Correct identification of CCPs essential

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Principle 2

- When determining CCPs, need to consider:
  - Identified Hazards and ***Likely*** occurrence
  - Processes that the food will be subjected to
  - Intended use of product
- Correct determination is vital
- Logical approach required:
  - Decision trees often used (but not essential)

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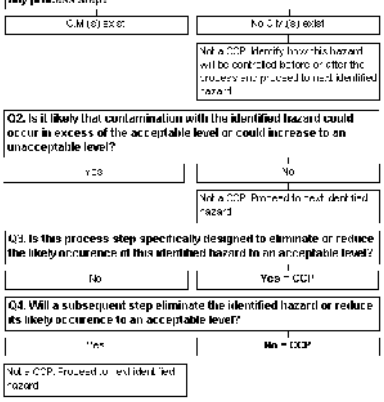

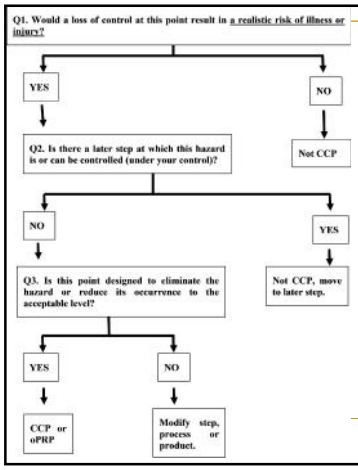

- Simplified decision tree

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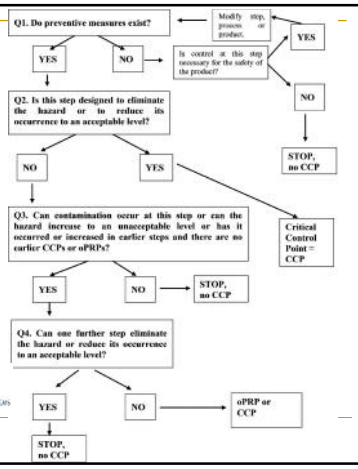

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Principle 3

- ***Establish Critical Limits***
  - Max/min value at which parameter must be controlled at CCP to control hazard.
  - Critical limits can be based on:
    - pH
    - Salt content
    - a_w
    - Temperature
    - Time etc

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Principle 4

- ***Establish Monitoring Procedures***
  - Planned sequence of:
    - Observations
    - Measurements
- Effective monitoring involves trend analysis
  - Intervention before loss of control occurs
- Loss of control at CCP = **Imminent Risk**

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Principle 4

- Monitoring of controls by food business operator:
  - Only required at critical points
  - Frequency depends on:
    - Nature of product ie uniform size
    - Nature of process ie automated/manual
    - Nature of production ie batch size
    - History of previous checks

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Principle 4

- Monitoring may include:
  - Temperature checks
  - a_w checks
  - Visual checks
  - Timing of process
  - pH checks
  - Gas monitoring (MAP)
  - Chemical analysis

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Principle 4

- Microbiological examination
  - Seldom effective form of monitoring
  - Most effective as verification tool

- Chemical analysis:
  - Better to measure conditions rather than contaminants
  - Rapid tests may be useful

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Principle 5

- ***Establish Corrective Actions***
  - Essential when deviation from critical limits occurs
- HACCP plan should identify:
  - Action required when deviation occurs
    - Including investigation of cause
  - Who is responsible for implementing corrective action
  - What records should be made

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Principle 5

- Some corrective actions are specified in pre-requisites i.e:
  - Product withdrawal
    - NB. requirement for FBO to inform competent authority if unsafe food has left their control. Article 19 178/2002

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Principle 5

- Effective corrective action involves:
  - Investigation of cause and correction of non-compliance
  - Identify and retrieve affected product
  - Record the above

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Principle 6

- ***Establish Verification Procedures***
- Check that HACCP is fit for purpose
- Validation
  - Ensure that all controls are scientifically sound
- Calibration details
- Independent verification useful
- Additional verification (Review) required:
  - For new products
  - where new hazards identified

Principle 7

- ***Establish Documentation***
- Should include:
  - Summary of hazard analysis
  - Rationale in hazard identification
  - HACCP team/responsibilities
  - Description of food, distribution etc
  - Verified flow diagram
  - HACCP plan diagram

- Purpose of documentation
  - To ensure effective implementation

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Codex seven principles Summary

- Conduct a Hazard Analysis
- Determine the Critical Control Points
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Questions?

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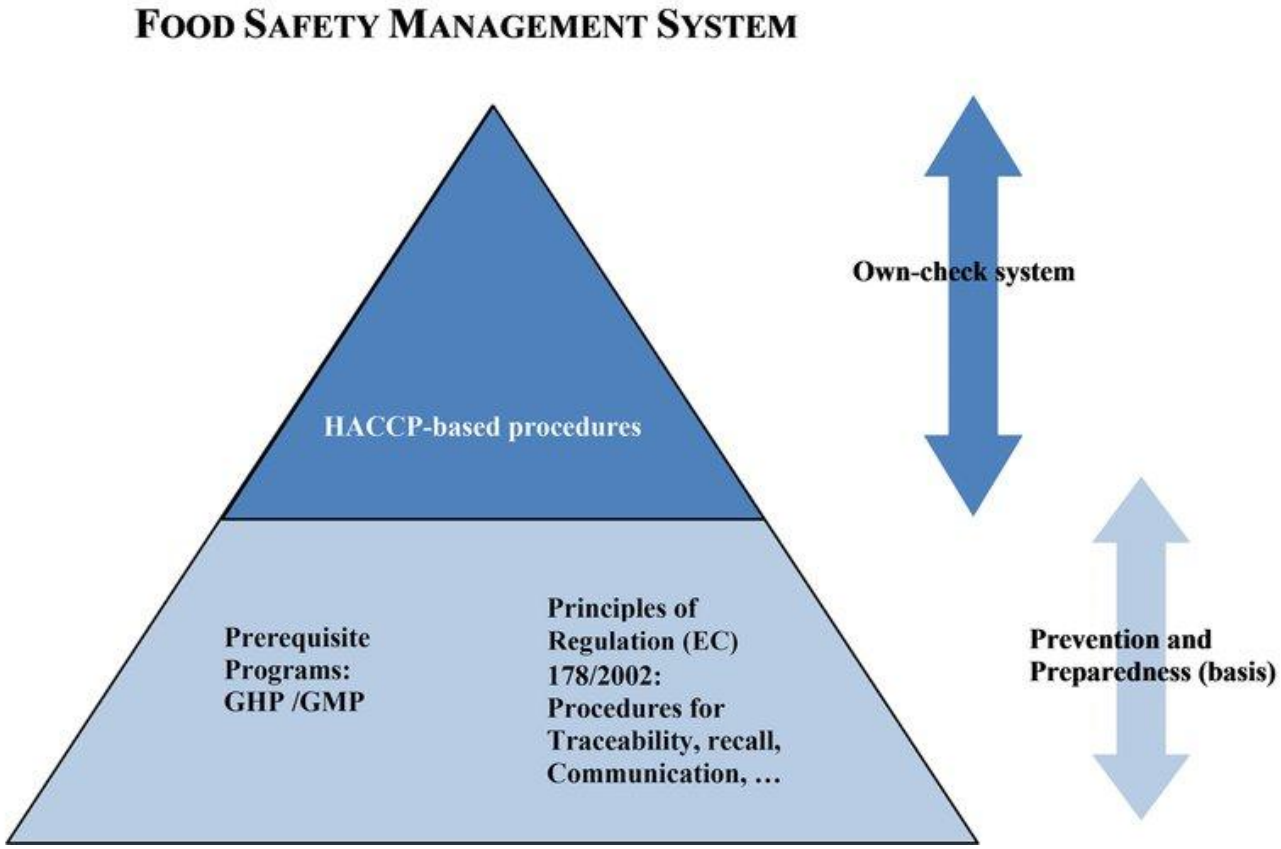
Pre-requisite programmes (PRPs)



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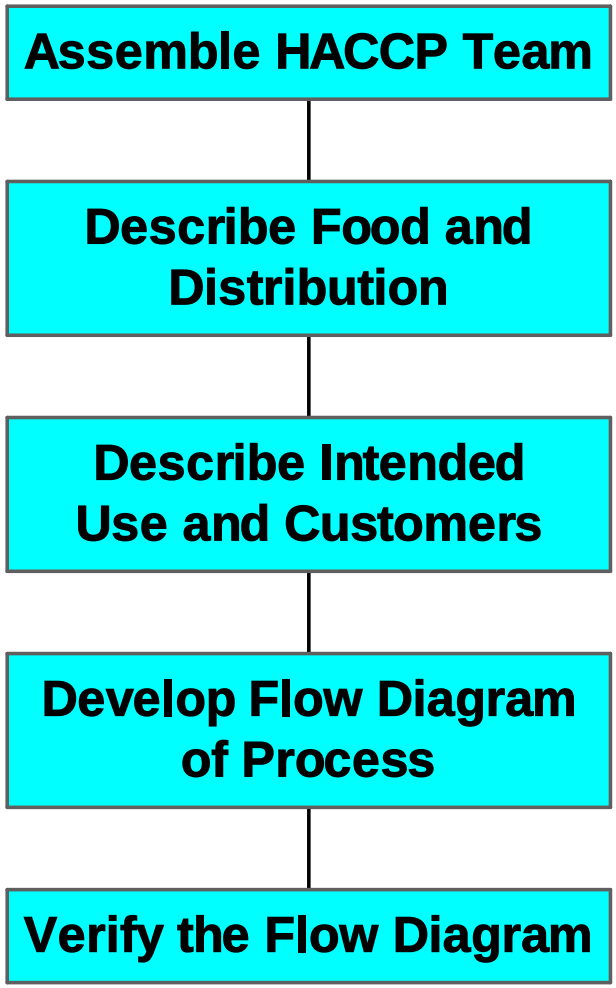

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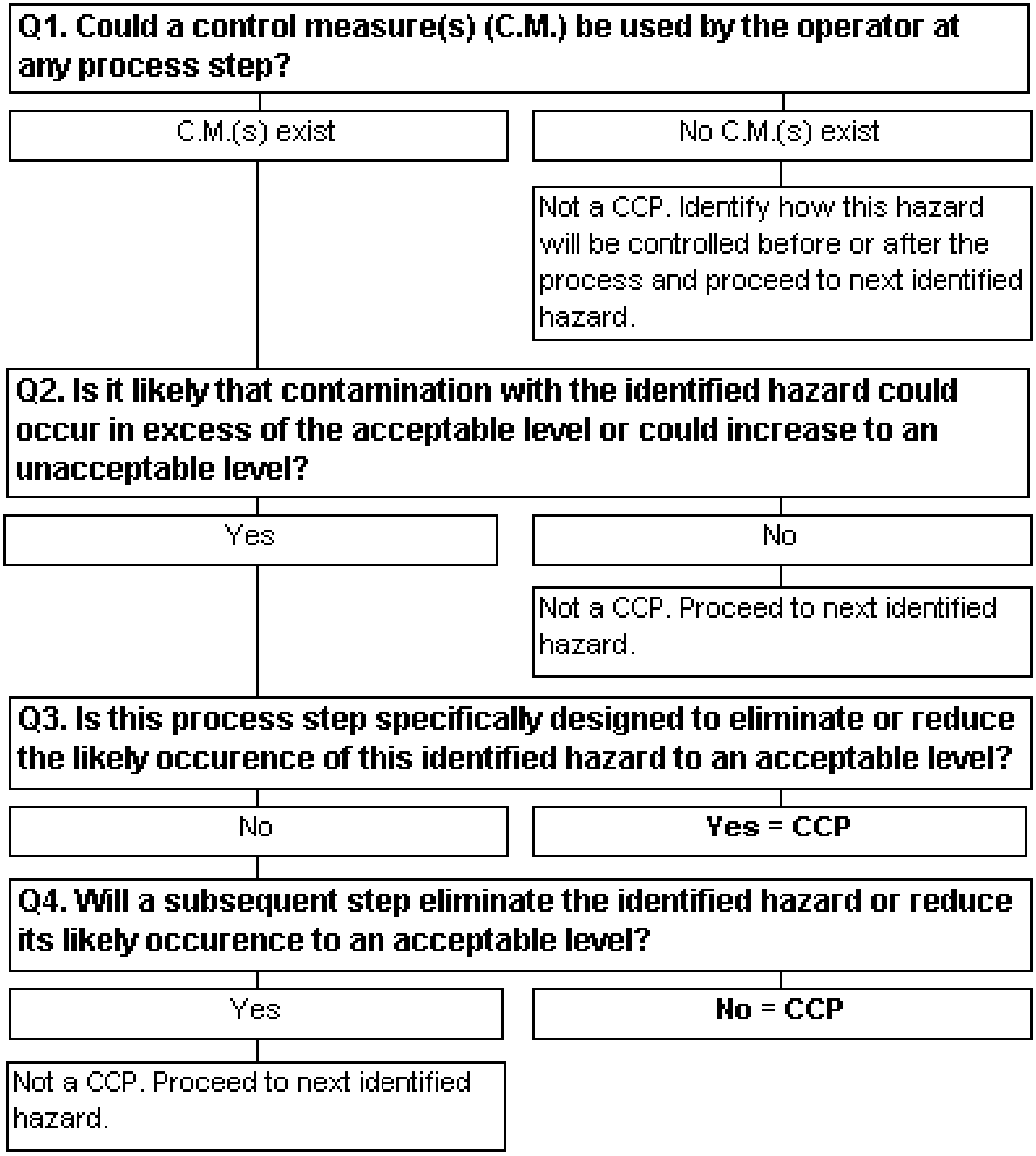
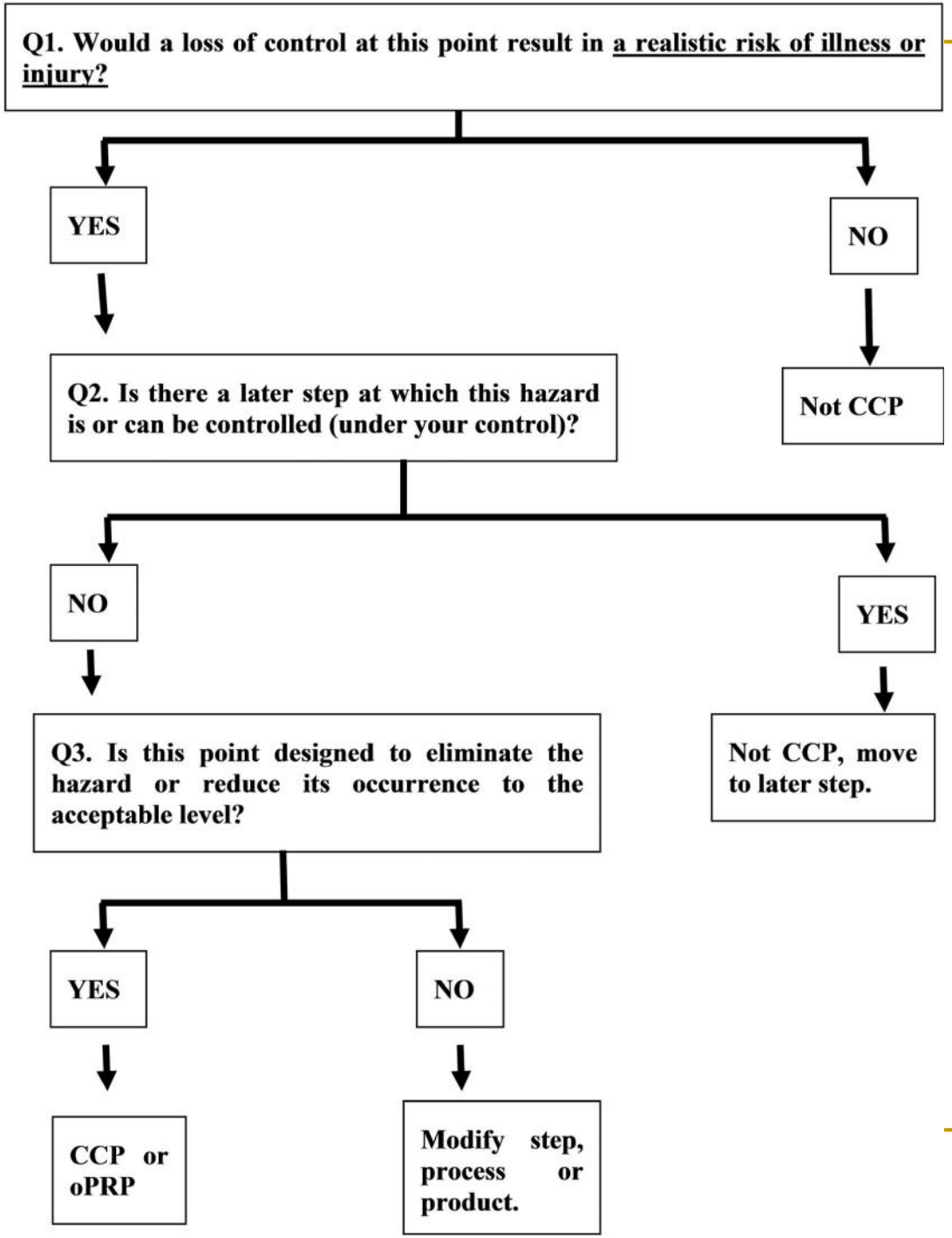
EFFECT


Q1. Could a control measure(s) (C.M.) be used by the operator at any process step?
C.M.(s) exist
No C.M.(s) exist
Not a CCP. Identify how this hazard will be controlled before or after the process and proceed to next identified hazard.
Q2. Is it likely that contamination with the identified hazard could occur in excess of the acceptable level or could increase to an unacceptable level?
Yes
No
Not a CCP. Proceed to next identified hazard.
Q3. Is this process step specifically designed to eliminate or reduce the likely occurence of this identified hazard to an acceptable level?
No
Yes = CCP
Q4. Will a subsequent step eliminate the identified hazard or reduce its likely occurence to an acceptable level?
Yes
No = CCP
Not a CCP. Proceed to next identified hazard.



- Simplified decision tree

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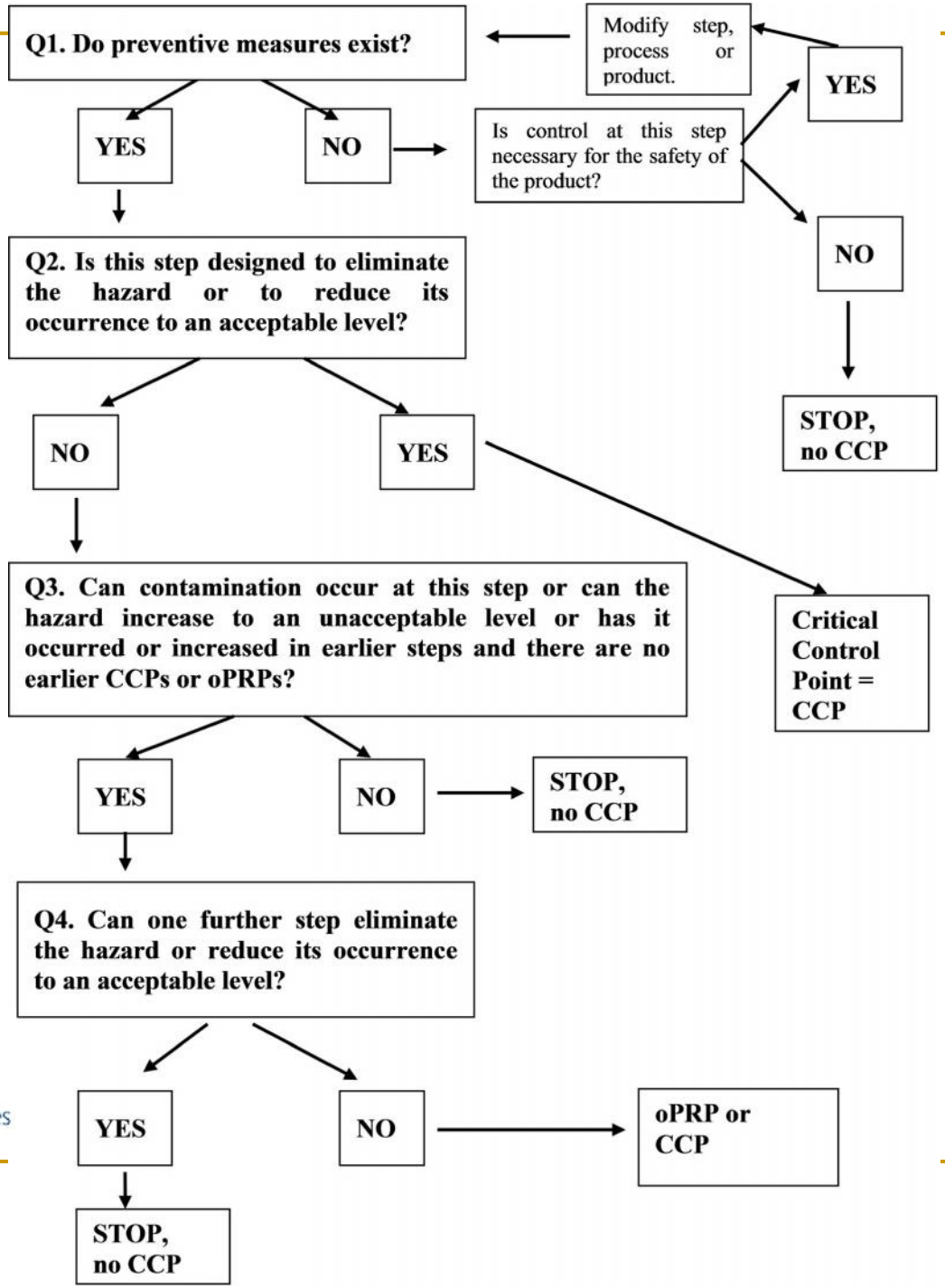

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