

The background is a solid blue color with several large, overlapping, light blue crescent moon shapes. A solid orange square is positioned on the left side, partially overlapping one of the light blue shapes.

# Guidelines For Food Safety

Dairy Food Manufacturers



# 1

## Introduction

This Guideline provides a framework for the development of a Food Safety Program and outlines the minimum food safety outcomes that an operator of a dairy food manufacturing business should achieve.

A Food Safety Program is comprised of a Hazard Analysis and Critical Control Point (HACCP) system that is complemented with standard operating procedures to ensure good manufacturing practices (GMP) are in place that enable food safety hazards to be reduced or eliminated.

The information in this Guideline is based on the following food safety criteria:

- Control and prevention of microbiological contamination;
- Control and prevention of chemical contamination;
- Control and prevention of physical contamination; and
- Effective identification and traceability.

The Food Safety Program requirements in this guideline have been contextualised for dairy food manufacturing and are based on the Hazard Analysis and Critical Control Point (HACCP) principles outlined in Codex Alimentarius – General Principles of Food Hygiene, FAO/WHO – Annex Hazard Analysis and Critical Control Point Systems and Guidelines for Application.

Dairy Food Safety Victoria is responsible for the production of safe dairy food within the state of Victoria and can provide a range of specialised material to further assist with the preparation of manufacturers' Food Safety Programs. Information can be accessed through the organisation at:

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## Acknowledgments

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GARDINER FOUNDATION

# 3

## Definitions

### Calibration

Process of comparing an instrument's accuracy to known standards.

### Cleaning

The removal of soil, food residue, dirt, grease or other objectionable material that may cause contamination of dairy food.

### Contaminant

Any biological or chemical agent, foreign matter, or other substances not intentionally added to food which may compromise dairy food safety or is not intended or expected to be present.

### Contamination

The introduction or presence of a contaminant in the dairy food or dairy food environment.

### Dairy Food

In accordance with the definition provided in the Dairy Act 2000 (Victoria).

### Disinfection

The reduction, by means of chemical agents and/or physical methods, of the number of micro-organisms in the environment to a level that does not compromise dairy food safety.

### Food Safety

Assurance that dairy food will not cause harm to the consumer when it is prepared and/or consumed according to its intended use.

### Hazard Analysis and Critical Control Point (HACCP)

A system which identifies, evaluates, and controls hazards associated with food safety.

### Hazard

A biological, chemical or physical agent in, or condition of, food with the potential to cause an adverse health effect in humans.

### Manufacture

Includes preparation and processing.

### Non-conformance

Where equipment, product or management practices do not meet minimum food safety outcomes, or where a requirement of a Food Safety Program has not complied with the appropriate standards.

### Potable Water

Water that is acceptable for human consumption and poses no threat to dairy food safety.

### Procedure / protocol

A documented sequence of actions that describe how a process is conducted.

### Sanitisation

The process of making something sanitary, as by cleaning or disinfecting.

### Validation

A process through which evidence is obtained to demonstrate that the food safety controls in place achieve the outcome of safe food.

### Verify/ Verification

The application of tests, procedures, and other methods, in addition to monitoring to determine compliance with the Food Safety Program.

# 4

## The Application of the HACCP System

### 4.1 The HACCP System

Hazard Analysis and Critical Control Point (HACCP) is a system that is designed to control food safety hazards through prevention rather than end point control. HACCP focuses on analysing the hazards associated with a manufacturing process and establishing control at each critical control point.

The HACCP system should be applied to each manufacturing process separately and the specific details of the resultant HACCP Plan will vary depending on the manufacturer's food processing operations.

The HACCP Plan should be reviewed and necessary changes made when any modification is made in the product or any step of the process.

HACCP is based on seven principles. These are outlined below.

#### **PRINCIPLE 1: Hazard Analysis**

This requires an analysis of a particular process to determine which hazards are significant for food safety.

#### **PRINCIPLE 2: Determine Critical Control Points (CCPs)**

This requires looking at each step of the process and determining the points at which control can be applied in order to prevent or eliminate a food safety hazard or reduce it to an acceptable level.

#### **PRINCIPLE 3: Establish Critical Limits**

This requires determining the boundary of acceptability and unacceptability and thus establishing critical limits for each CCP.

#### **PRINCIPLE 4: Monitor Critical Control Points**

This requires establishing a system to monitor control of the CCP by conducting observations or measurements.

#### **PRINCIPLE 5: Corrective Action**

This requires establishing the corrective action to be taken when monitoring indicates that a particular CCP is not under control.

#### **PRINCIPLE 6: Verification**

This requires the establishment of procedures for verifying that the HACCP system is working effectively.

#### **PRINCIPLE 7: Recording**

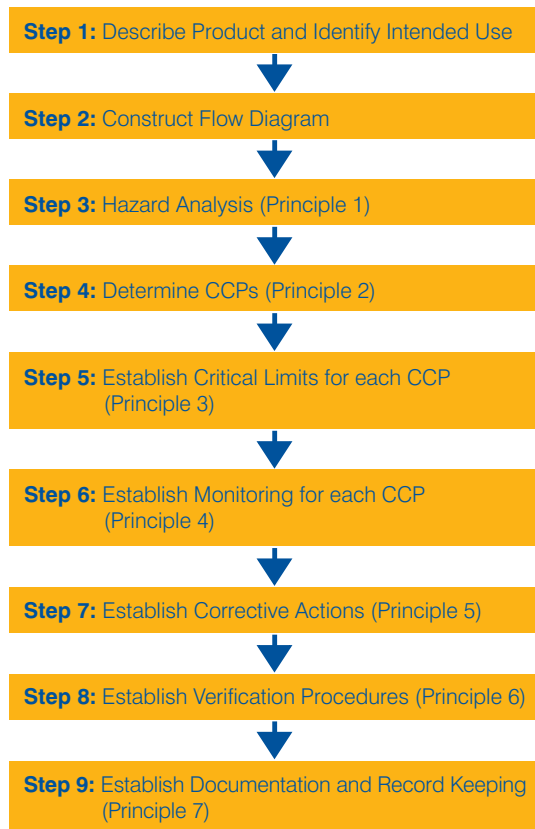
This requires documenting and recording all procedures, monitoring and verification activities and corrective actions conducted under the HACCP system.

### 4.2 Developing a HACCP system

When developing a HACCP system it is important to follow a logical sequence to ensure that all aspects of a production process are considered. Failure to do this can result in a system that does not accurately reflect the manufacturing process, which will defeat the purpose of the HACCP system. The flow chart shown in Diagram 1: "Steps for Developing a HACCP System" illustrates the systematic process that should be followed.

It is important to keep records that describe what occurred at each step of developing a HACCP system. A sample form for documentation is shown in Appendix I: HACCP System Table.

Diagram 1: Steps for Developing a HACCP System



#### 4.2.1 Describe Product and Identify Intended Use

A complete description of the product being manufactured should be made to assist with the hazard analysis. This description should include relevant safety information such as:

- Composition;
- Method of preservation;
- Packaging;
- Shelf life;
- Storage conditions;
- Distribution method; and
- Labelling.

The intended use of the product should be identified; this description should be based on the expected use by the consumer (See Appendix II – Product Description and Intended Use Form). Vulnerable groups of the population should be identified, eg. aged, infants, allergenic.

#### 4.2.2 Construct Flow Diagram

A detailed flow diagram should then be constructed to accurately reflect the manufacturing process; special care should be taken to ensure this diagram covers all the steps undertaken by the manufacturer during production.

A check of the manufacturing process against the flow diagram should then be conducted to ensure that the process is accurately represented during all stages and hours of operation. The flow diagram should be amended to remain current.

#### 4.2.3 Hazard Analysis (PRINCIPLE 1)

All hazards that may occur at each step of the manufacturing process should be identified and documented. The type of hazard should be defined as chemical, physical or microbiological.

Each hazard should be assessed in order to identify whether it is significant and needs to be reduced to an acceptable level to ensure the production of safe food. The hazard analysis may consider the following:

- The likely occurrence of the hazard and the severity of any adverse health effects it may cause;
- The qualitative and/or quantitative evaluation of the presence of the hazards;
- Survival or multiplication of undesirable micro-organisms;
- Production or persistence of toxins, chemical or physical agents;
- Conditions leading to the above.

Once the significant hazards have been identified, measures used to control each significant hazard should be identified (See Appendix III – Hazard Analysis Form). These control measures should be measurable.

#### 4.2.4 Determine Critical Control Points (PRINCIPLE 2)

The significant hazards should be assessed to determine the CCPs of the process to control the identified hazards. There may be more than one CCP at which control is applied to address the same hazard.

A CCP can be determined by the use of the decision tree shown in Appendix IV. If a hazard has been identified at a step where control is necessary for food safety, and no control measure exists, then the product or process should be modified to include a control measure.

#### 4.2.5 Establish Critical Limits for each CCP (PRINCIPLE 3)

Once CCPs have been identified, critical limits for each CCP should be specified. In some cases a CCP will have more than one critical limit. Criteria often used include specified limits of temperature, time, moisture level, acidity (pH), water activity ( $A_w$ ), concentration of cleaners and sanitisers.

#### 4.2.6 Establish a Monitoring System for each CCP (PRINCIPLE 4)

Monitoring procedures should be developed for each CCP identified. These procedures must be able to detect loss of control at the CCP and should provide information in time to make adjustments to ensure that control of the process is maintained.

Monitoring procedures may be developed by asking questions such as:

- What is going to be monitored?
- How is it going to be monitored?
- Where is the monitoring point going to be?
- When is it going to be monitored?
- Who is going to monitor it?

If monitoring is not continuous, then the frequency of monitoring should be sufficient to guarantee the CCP is under control.

Data derived from monitoring must be evaluated by a competent person with knowledge and authority to carry out corrective action when required to do so.

The person doing the monitoring must sign all records associated with the monitoring of CCPs.

#### 4.2.7 Establish Corrective Actions (PRINCIPLE 5)

Specific corrective actions should then be developed for each CCP in the HACCP plan in order to deal with deviations when they occur. Corrective actions will allow the CCPs to be brought under control again.

Corrective actions may be developed by outlining such things as:

- The disposal/reprocessing of the product; and
- Adjusting the process and confirming it is back in control.

Any deviation from critical limits and corrective actions undertaken should be recorded.

#### 4.2.8 Establish Verification Procedures (PRINCIPLE 6)

Verification procedures should be developed in order to determine if the HACCP system is working correctly.

Verification procedures may include activities such as:

- Random sampling or analysis of the product;
- Audit of the HACCP system;
- Audit of the records and documents kept; and
- Review of the deviations/product disposals/re-processing that has occurred.

Where possible, verification activities should confirm the effectiveness of all elements of the HACCP system and should be conducted regularly.

#### 4.2.9 Establish Documentation and Record Keeping (PRINCIPLE 7)

HACCP procedures should be documented accurately. Documentation and record keeping should be appropriate to the nature and size of the manufacturing process. Documents should include:

- Hazard analysis plans;
- Specifications;
- Specific procedures or methods; and
- Supporting information such as critical limit justification or chemical and microbial test results.

Records kept should include:

- CCP monitoring that occurs;
- Deviations beyond CCP limits and associated corrective actions that occur;
- Modifications to the HACCP system that arise from verification procedures.

#### Outcome

To provide evidence that non-conformances relating to dairy food safety are being managed.

## 5 Standard Operating Procedures

### 5.1 Non-conformance Control Program

5.1.1 A Food Safety Program should:

a) Document the system used for the control of non-conformances.

This should encompass:

- i. Actions immediately undertaken to control the non-conformance;
- ii. Investigations into the cause of the non-conformance; and
- iii. Actions undertaken to prevent the non-conformance recurring.

- b) Contain records which detail:
  - i. Date;
  - ii. What the non-conformance was;
  - iii. The actions immediately undertaken to control the non-conformance with time frames for implementation;
  - iv. What investigations were undertaken;
  - v. The cause identified and the actions to rectify;
  - vi. Actions to prevent it recurring with time frames for implementation; and
  - vii. Who is the person responsible for ensuring that the activities are undertaken and completed.

## 5.2 Cleaning and Sanitising

5.2.1 A Food Safety Program should:

- a) Document how cleaning and sanitising is to be carried out, explaining:
  - i. What is cleaned and sanitised;
  - ii. Details of how cleaning and sanitising is carried out; and
  - iii. Frequency of cleaning and sanitising.
- b) Contain records to check that cleaning and sanitising is effective. These should detail:
  - i. When the check was completed;
  - ii. What was checked;
  - iii. Results of the check; and
  - iv. Who performed the check.

5.2.2 The cleaning and sanitising protocol should not pose a risk to food safety, and should have available the complete Material Safety Data Sheets (MSDS) for all chemicals used.

### Outcome

To minimise the risk of contamination of dairy food.

## 5.3 Maintenance Program

5.3.1 A Food Safety Program should:

- a) Document how the maintenance of premises and equipment is managed. This should outline:
  - i. How maintenance is reviewed;
  - ii. Frequency of maintenance reviews; and
  - iii. How maintenance issues are rectified.
- b) Contain records for maintenance reviews. These should detail:
  - i. When the review was completed;
  - ii. What was reviewed;
  - iii. By whom; and
  - iv. Results of the review.

### Outcome

To ensure that premises and equipment does not contribute to the contamination of dairy food.

## 5.4 Pest Control

5.4.1 A Food Safety Program should:

- a) Document how pests are controlled, monitored, how frequently monitoring is carried out and the locations of control measures.
- b) Contain records that identify:
  - i. Date of monitoring;
  - ii. What was checked during monitoring;
  - iii. By whom; and
  - iv. Results of check.

5.4.2 The pest control protocol should not pose a risk to food safety, and should have available the complete Material Safety Data Sheets (MSDS) for all chemicals used.

### Outcome

To ensure that dairy food is protected from contamination by pests.

## 5.5 Storage

5.5.1 Storage Temperature

- a) A Food Safety Program should document how the temperature is controlled to ensure the safety of the dairy food.
- b) Dairy food should be kept at 5°C or below to ensure the microbiological safety of the food will not be adversely affected for the time the food is at that temperature.
- c) Some dairy food (eg fermented products) may be kept at other storage temperatures if the dairy food manufacturer can provide objective evidence that demonstrates that the storage of dairy foods at these temperatures will not adversely affect the microbiological safety of the dairy food.

5.5.2 Storage Conditions

- a) Dairy food and dairy food ingredients should be stored in a location and manner that will manage any risk of contamination or loss of identification.

### Outcome

To ensure that dairy food is protected from all sources.

## 5.6 Calibration of Equipment

5.6.1 A Food Safety Program should:

- a) Identify and list all measuring equipment critical to food safety.
- b) Document how measuring equipment is calibrated, how frequently calibrations are carried out, and identify the specifications used for calibration.
- c) Contain records for all calibrated equipment. These must detail:
  - i. What tests will be conducted on equipment;
  - ii. Date of calibration;
  - iii. What was calibrated;
  - iv. Who performed calibration; and
  - v. Results and accuracy of calibration.

### Outcome

To ensure that measuring equipment critical to food safety is calibrated to verify its accuracy.

## 5.7 Testing Programs

5.7.1 A Food Safety Program should document product & environmental testing programs.

These should identify:

- i. What tests will be conducted;
- ii. How the program is conducted;
- iii. Frequency of testing;
- iv. Acceptable levels and specifications used; and
- v. Records that are kept to support the testing protocols.

### Outcome

To verify the effectiveness of the Food Safety Program in preventing contamination of dairy food.

## 5.8 Incoming Products

5.8.1 A Food Safety Program should:

- a) Document the criteria and/or specifications for acceptance of incoming milk and ingredients other than milk.
- b) Contain records demonstrating compliance with the criteria and/or specifications.

### Outcome

To ensure that incoming milk and ingredients do not pose a risk to food safety.

## 5.9 Product Recalls

5.9.1 A Food Safety Program should document how product recalls are carried out and ensure that they comply with the current edition of the Food Standards Australia New Zealand (FSANZ) Food Industry Recall Protocol (2004).

### Outcome

To ensure that humans do not consume contaminated dairy food.

## 5.10 Product Identification and Traceability

5.10.1 A Food Safety Program should:

- a) Document:
  - i. How manufactured dairy foods are identified; and
  - ii. How ingredients are identified.
- b) Document the system by which the immediate supplier of dairy foods and ingredients used in manufacture and also the immediate recipient of all dairy foods manufactured are identified.

### Outcome

To ensure that dairy foods that do not comply with food safety standards can be traced back to their source and traced forward to the receiver.

## 5.11 Hold and Release Systems

5.11.1 A Food Safety Program should document the hold and release system to be followed in instances of suspected contamination.

### Outcome

To ensure that humans do not consume contaminated dairy food.

## 5.12 Rework or Disposal of Product

5.12.1 A Food Safety Program should document how the reworking or disposal of contaminated dairy foods will be undertaken, ensuring compliance to the mandatory requirements for pathogens.

## 5.13 Waste Disposal

- a) A Food Safety Program should document the waste management system.
- b) Establishments should have an efficient effluent and waste disposal system, which must be maintained in good order and repair to protect dairy foods from contamination.
- c) All effluent lines (including sewer systems) should be large enough to carry peak loads and must be constructed so as to avoid contamination of potable supplies.

### Outcome

To ensure that dairy food does not pose a risk to human health.

### 5.14 Competency

5.14.1 A Food Safety Program should:

- a) Describe the training requirements for all employees performing operations that impact on food safety.
- b) Contain records that identify:
  - i. The name of the employee;
  - ii. Details of training planned and undertaken;
  - iii. Date of completion of training; and
  - iv. Who provided the training.
- c) Ensure that all people involved in the manufacture and handling of dairy foods have suitable skills & knowledge of food safety & hygiene principles and practices commensurate with their work activities.

#### Outcome

To ensure that people involved in the manufacture of dairy food are competent.

### 5.15 Internal Audit

5.15.1 A Food Safety Program should:

- a) Document an internal auditing system detailing what is audited and the frequency of audits.
- b) Contain records which detail:
  - i. Date of audit;
  - ii. What was audited;
  - iii. Who performed the audit;
  - iv. Results of the audit; and
  - v. Actions taken to address issues raised by audit with time frames for implementation.

#### Outcome

To ensure that the Food Safety Program is effective and implemented.

### 5.16 Management Responsibility

5.16.1 A Food Safety Program should:

- a) Identify the person responsible for the overall implementation of the program.
- b) Identify the person(s) responsible for each element of the program.
- c) Outline the system by which Management ensures that corrective actions are implemented effectively and in a timely manner.

#### Outcome

To ensure that all elements of the Food Safety Program are implemented.

### 5.17 Record Retention

5.17.1 All records must be kept for a minimum of four (4) years and must be made available to a DFSV Authorised Officer or their Approved Auditor upon request.

#### Outcome

To ensure that documentation is kept to verify that the Food Safety Program is effective and implemented.

# 6 Premises Construction

## 6.1 General Construction

- a) All premises and facilities should be of sound construction and maintained in good condition.
- b) All premises and facilities should be designed and constructed and maintained so as to minimise the entry and harbourage of dust and pests.
- c) The interior of all buildings, including walls, floors, ceilings, fittings and equipment, should be kept in a clean, sound condition and free from dust and pests.
- d) Working surfaces should be in sound condition, durable and easy to clean, maintain and disinfect.

## 6.2 Internal Structures and Fittings

- a) Floors, walls, doors, partitions and ceilings should be soundly built of durable materials and be easy to clean and where appropriate, able to be disinfected.
- b) The surfaces of floors, walls, doors and partitions should be made of impervious, non-toxic materials.
- c) Ceilings and overhead fixtures should be constructed and finished to minimise the build up of dirt and condensation, and the shedding of particles.
- d) Windows that can be opened should be easy to clean, be constructed to minimise the build up of dirt and be fitted with removable and cleanable insect-proof screens.

## 6.3 Access Points to the External Environment

- a) Doors, hatches and other access points to the outside of the building, or where physical separation is required, should be designed, constructed and sealed so as to prevent the entry of pests or dust into the food handling areas.
- b) Airlocks, where fitted, should be effective in preventing the entry of pests, dirt, or any other contamination that may affect the safety of dairy food.

## 6.4 Drains

- a) All drains should be of suitable size for the designated purpose, have adequate access for effective cleaning and be effectively sealed by a water trap.

## 6.5 Ventilation

- a) All processing areas should have sufficient natural or mechanical ventilation to effectively remove fumes, smoke, steam, and vapours from the food premises.

## 6.6 Water

- a) Only potable water should be used in food handling and processing.
- b) If a dairy manufacturer can demonstrate that the use of non-potable water will not adversely affect the safety of the food handled, the manufacturer may use non-potable water for that purpose.
- c) Steam used in direct contact with food or food contact surfaces should not constitute a threat to the safety of the dairy food.

### 6.7 Lighting

- a) A premises should have a lighting system that provides sufficient natural or artificial light for the activities conducted on the premises.
- b) Lights should be effectively positioned and covered to protect exposed product from contamination.

### 6.8 Personal Hygiene Facilities and Toilets

- a) Personal hygiene facilities should be available to ensure that a sufficient degree of personal hygiene is maintained and to prevent any contamination of dairy food.
- b) The personal hygiene facilities should be designed, constructed, located and maintained to prevent any risk of contamination of the dairy food.

## 7 Equipment

### 7.1 Construction and Cleaning

- a) Dairy manufacturing equipment, utensils and food contact surfaces should be designed, situated, constructed and maintained in a manner that protects dairy foods from contamination.
- b) All equipment and utensils used for the manufacture of dairy food, and collection or transport of dairy food should be capable of being readily taken apart for cleaning and sanitising or constructed and designed for effective cleaning-in-place.

### 7.2 Stairs, Platforms and Stands

- a) All stairs, catwalks, stands, platforms, ladders and the like in processing areas should be designed, constructed and installed so as to be impervious to water, easy to clean, impact and corrosion resistant.
- b) All stairs, catwalks, stands and platforms should be so situated and constructed as to minimise the risk of contamination to dairy foods.

### 7.3 Surfaces

- a) The surfaces used for the manufacture of dairy food should be of a material and construction that is impervious to water, easy to clean and will not rust or corrode.

#### Outcome

To ensure that equipment used in the manufacture of dairy food does not compromise food safety.

# 8

## Hygienic Practices

### 8.1 Personal Hygiene and Cleanliness

- a) A Food Safety Program should describe personal hygiene and cleanliness practices.
- b) A person must maintain a high degree of personal hygiene and cleanliness and, where appropriate, wear suitable protective clothing, head covering, and footwear.
- c) People involved in the manufacture and handling of dairy foods should refrain from behaviour which could result in contamination of the dairy food.
- d) People who are injured or infected with an illness or disease that can potentially contaminate dairy food should be managed in a manner that precludes any risk to dairy food safety.

#### Outcome

To ensure that people involved in the manufacture of dairy foods do not contaminate the dairy food.

# 9

## References

Codex Alimentarius, Hazard analysis and critical control point (HACCP) system and guidelines for its application – annex to CAC/RCP 1-1969, Rev. 4 (2003)

Food Standards Australia New Zealand, Food Industry Recall Protocol – A guide to writing a food recall plan and conducting a food recall. 5th Edition, June 2004.

[http://www.foodstandards.gov.au/\\_srcfiles/5th%20FIPR\\_june04.pdf](http://www.foodstandards.gov.au/_srcfiles/5th%20FIPR_june04.pdf)  
Dairy Act 2000 (Victoria) (Act No. 37/2000)

# 10 Appendices

## Appendix I: HACCP System Table

Step	Hazard	Type of Hazard	Control Measure	CCP	Critical Limit	Monitoring	Corrective Action	Records

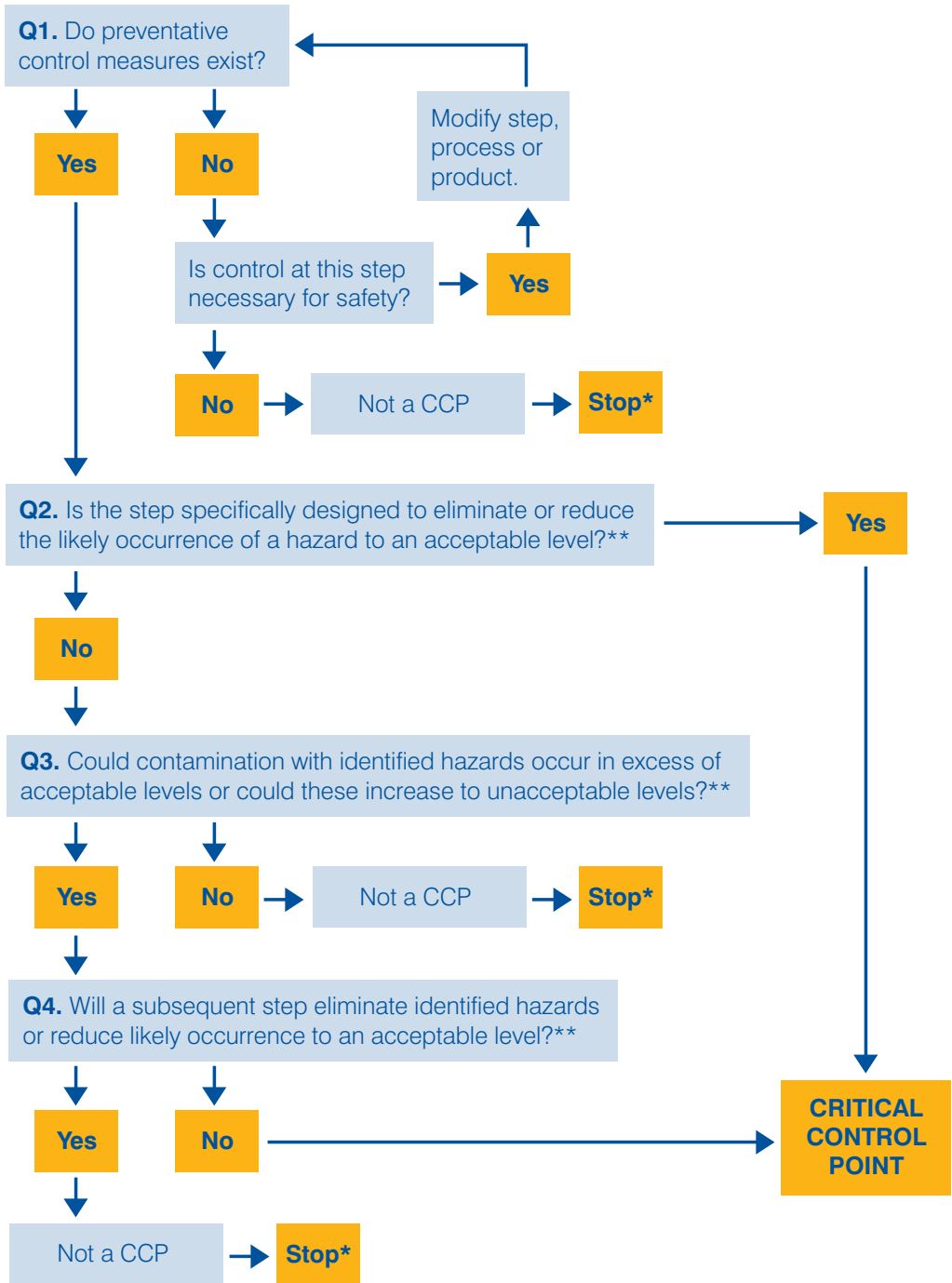
**Appendix II: Product Description and Intended Use Form**

Product	
Composition	
Method of preservation	
Packaging - primary	
- secondary	
Storage Conditions	
Distribution Method	
Shelf Life	
Sensitive Consumers	
Intended Use	

**APPENDIX III: Hazard Analysis Form**

Step	Input	Hazards	Significance			Control Measure
			Severity	Likely Occurrence	Significant	
1						
2						
3						
4						
5						

**APPENDIX IV: Critical Control Point Decision Tree**



\* Proceed to the next identified hazard in the described process

\*\* Acceptable and unacceptable levels need to be determined within the overall objectives in identifying the CCP's of the HACCP system



