

# HACCP System in Controlling Microbiological Hazards in Food

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## Abstract

A preventive approach to guaranteeing food safety is the Hazard Analysis and Critical Control Point (HACCP) system. Based on the identification of potential hazards to food safety and on measures aimed at preventing these hazards, its objectives are the identification of consumer safety hazards that can occur in the production line and the establishment of a control process to guarantee a safer product for the consumer. The preferred method for managing food safety is HACCP. All aspects of food production, including fundamental husbandry techniques, food preparation and handling, food processing, food service, distribution networks, and consumer handling and usage, can benefit from adhering to the HACCP principles. Every stage of the production process for food safety involves the HACCP system.

## Introduction

Food safety is a serious issue with wide-ranging implications for public health. Unsafe food can lead to serious health problems, including gastrointestinal infections, chronic diseases, and even death. The impacts are particularly severe for vulnerable populations like infants, young children, the elderly, and those with weakened immune. Food safety is critical for any culinary establishment, whether it's a small cafe or a large restaurant chain. The stakes are high, and neglecting food safety can lead to severe consequences, including health risks for consumers and damage to a business's reputation. HACCP [Hazard Analysis Critical Control Point] will prevent the occurrence of microbiological hazards in food. HACCP proposed certain laws which should be strictly followed by the food companies, while making their food product. HACCP objectifies on prevention in lieu of inspection. Critical Control Point has the primary objective of controlling processes and conditions. HACCP is a well-organized, pliable and well-planned implementation of science and technology for prevention and authentication of safe food production. HACCP has wider application in different disciplines including microbiology, environmental health, public health, food technology based on distinct situations.

**HACCP Concept:** It's critical to never forget that the foundation of successful HACCP programs is

essentially the use of common sense and preventative measures to deal with issues before they become problems. Prediction is prioritized above response, and getting the process right from the start rather than making adjustments after issues arise. It placed a strong emphasis on spotting possible issues with food safety and figuring out where and how to regulate or avoid them. The HACCP system covers instructions, employee training, implementation, documentation, and assurance at every stage of the food chain.

## Objectives

- Preventing food poisoning.
- Reduces losses from product recalls.
- Safeguards brand equity.
- Lowers food analysis expenses.
- Improves quality assurance system and concentrates on recognizing and averting food contamination risks through the use of solid scientific principles.
- Makes it possible for government monitoring to be more effective and efficient.
- Lowers trade obstacles between countries.
- Assists food companies in their efforts to compete more successfully on the global stage.

## Principles

### Carry out a risk analysis

By creating a flow diagram that shows every handling and preparation process from receiving to serving, you may identify the risks connected to a particular menu item. a list of the possible risks connected to each stage and instructions on how to avoid them at each one. Chemical, physical, biological, and allergy hazards are all possible. Additionally, a list of risks that are likely to materialize and that, if left unchecked, will have dire repercussions must be anticipated. Low risk and unlikely hazards might not require consideration.

### Identify the CCPs

Any phase, technique, or place where biological, physical, or chemical components can be regulated is referred to as a control point. Any action, technique, or point where an identified danger can be

avoided, lowered to an acceptable level, or eliminated is known as a critical control point (CCP). Compared to control points, critical control points are observed far more frequently.

#### **Determine the essential limit or limits.**

Critical limits can be derived from regulatory standards and guidelines, scientific literature, experimental studies, and expert consultation. Examples of critical limits include temperature, time, physical dimensions, water activity, pH, and available chlorine. This step involves establishing criteria that must be met to prevent, eliminate, or reduce the identified hazard at the CCP so that the food is safe to eat.

#### **Install a surveillance system**

A scheduled inspection or measurement to ascertain whether a CCP is under control is called monitoring. Visual observations, temperature readings, time assessments, pH readings, water activity measures, and other methods are examples of monitoring.

#### **Decide on corrective measures.**

Corrective measures centre on what to do in the event that a food reaches the critical level below. The temperature of a cooker is an example of a corrective action; discarding food could also be one. Keep track of every remedial activity that has been done.

#### **Create verification protocols**

- Verify that all CCPs critical limits are sound.
- Verify that the HACCP strategy for the establishment is being correctly executed.
- To ensure proper implementation, have regulatory personnel examine the strategy.
- Verify the precision of every piece of monitoring gear.

#### **Generate records**

Documenting information that may be utilized to demonstrate that the food was produced properly is a crucial part of the HACCP strategy. The HACCP plan's details must also be included in the records. Information about the HACCP Team, the product description, flow diagrams, the monitoring system, the critical limits, the hazard analysis, the detected CCPs, the corrective actions, recordkeeping procedures, and verification procedures should all be included in the record.

#### **Training**

Effective HACCP implementation requires raising consumer knowledge and providing HACCP concepts and applications training to employees in industry, government, and academics. Working instructions and procedures that specify the responsibilities of the operating staff assigned to each Critical Control Point should be created in order to facilitate the development of specialized training to support a HACCP plan. It is crucial that primary producers, business, trade associations, consumer organizations, and accountable authorities work together. Opportunities for industry and control authorities to train together should be made available in order to foster ongoing communication and foster an environment of understanding regarding the real-world application of HACCP.

#### **Conclusion**

HACCP is a crucial element of global food trade and the cornerstone of European and international law pertaining to the food sector. For the HACCP program to succeed, appropriate management and implementation are required. In large part, this depends on routinely planned verification tasks. It is necessary to update and improve the HACCP plan. Keeping the HACCP system up to date requires making sure that everyone involved has received the necessary training to comprehend their roles and carry them out efficiently. These days, the standards set by the food industry help food firms comply with the law and, in many cases, even go above and beyond it. A large number of these incorporate business processes including good manufacturing procedures (GMP), GHP, and HACCP, giving food businesses strategies for creating an integrated food safety management system, which is a practical and economical way to regulate the quality and safety of products. This might help food industry operators guarantee global fair-trade compliance with respect to product quality and safety.

#### **References**

- Reilly, A., & Käferstein, F. J. A. R. (1997). Food safety hazards and the application of the principles of the hazard analysis and critical control point (HACCP) system for their control in aquaculture production. *Aquaculture research*, 28(10), 735-752.
- Notermans, S., Zwietering, M. H., & Mead, G. C. (1994). The HACCP concept: identification of

potentially hazardous micro-organisms. Food microbiology, 11(3), 203-214.

Ibrahim, O. O. (2020). Introduction to hazard analysis and critical control points (HACCP). EC Microbiology, 16(3), 42-50.

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