

## How to Make a HACCP Plan to Prevent Safety Hazards and Recalls in Food Manufacturing Industry

Investing in practices that ensure safety, quality, and consistency may require an initial investment, but they pay off in the long run

If your food manufacturing plant has to issue a product recall, many people might take to social media to vent their frustrations, resulting in a public backlash that can damage your brand's reputation. Other consumers might opt to switch brands, resulting in further revenue loss. How can you ensure you take every step possible to prevent this from happening? That's where implementing an HACCP plan comes into play for your food manufacturing plant.

### What is HACCP?

Hazard Analysis Critical Control Point (HACCP) is an internationally recognized food-safety management system for reducing the risks of safety hazards in food, including the analysis and control of biological, chemical, and physical hazards from raw material production, procurement, and handling. It spans the manufacturing, distribution, and consumption areas of the finished product for an overall comprehensive evaluation of safety and quality in food manufacturing.

HACCP plans were first created in 1960 when the National Aeronautics Space Administration (NASA) needed to send food into space. Since foodborne illnesses could mean life or death for an astronaut in space—and there would be limited resources and equipment to aid if a food safety breach occurs—safety and quality had to be wholly controlled during the manufacturing process. NASA used its concept of critical control points (CCP) from its engineering quality management processes to reveal areas that had significant risks and were considered hazards.

After NASA's success with the methodology, Pillsbury adopted the CCP mentality and solved its food-safety issues. This subsequently led the U.S. Food & Drug Administration (FDA) to task Pillsbury with implementing training programs for other industries and the birth of the HACCP plan.

Today, a HACCP plan is an international standard and has been recommended by the World Health Organization's Codex Alimentarius Commission since the 1990s.



### **Why do food manufacturers need a HACCP plan?**

HACCP is intended to reduce the risk of unsafe food products, but it also can lead to improved product quality.

Essentially, HACCP:

- Focuses on identifying and preventing hazards that may render food unsafe;
- Is based on sound science;
- Permits more efficient and effective government oversight, primarily because the record keeping allows investigators to see how well a firm is complying with food safety laws;
- Places responsibility for ensuring food safety appropriately on the food manufacturer or distributor;
- Helps food companies compete more effectively in the world market;
- Reduces barriers to international trade;

These internal and external factors affected by the implementation of a HACCP plan benefit food manufacturers in terms of compliance, competitiveness, and overall safety for the consumer.

### **Principles of HACCP plans**

Since its inception in the 1960s to ensure food safety in space travel, the application of HACCP principles has expanded throughout the food industry. The system utilizes seven principles and is required for all food manufacturers:

Principle 1: Conduct a hazard analysis;

Principle 2: Determine the critical control points (CCPs);

Principle 3: Establish critical limits (CL);

Principle 4: Establish monitoring procedures;

Principle 5: Establish corrective actions;

Principle 6: Establish verification procedures;

Principle 7: Establish record-keeping and documentation procedures;

An individual food producer is responsible for developing and implementing a HACCP plan for the food it processes or manufactures. A specific HACCP plan is needed for each food and for each processing system employed by a food business because every food and every processing system poses different risks and requires different risk management practices.

### **Five steps to make a HACCP plan**

There are several foundational steps to making a HACCP plan for your food manufacturing business. These five steps will go a long way to making a useful plan.

#### **1. Assemble the HACCP team**

The first task in developing a HACCP plan is to assemble a HACCP team consisting of individuals who have specific knowledge and expertise appropriate to the product and process. The team should be multidisciplinary and may include individuals from areas such as

engineering, production, sanitation, quality assurance, and food microbiology.

Due to the technical nature of the information required for hazard analysis, it's recommended that experts who are knowledgeable in the food process should either participate in or verify the completeness of the hazard analysis and the HACCP plan. Such individuals should have the knowledge and experience to correctly:

- Conduct a hazard analysis;
- Identify potential hazards;
- Identify hazards that must be controlled;
- Recommend controls, critical limits, and procedures for monitoring and verification;
- Recommend appropriate corrective actions when a deviation occurs;
- Recommend research related to the HACCP plan if important information is not known;
- Validate the HACCP plan.

## **2. Describe the food and its distribution**

The HACCP team must first describe the food. This consists of a general description of the food, ingredients, and processing methods. The method of distribution should be described along with information on whether the food is to be distributed frozen, refrigerated, or at ambient temperature. These details form the basis for the HACCP plan to conform with the particularities of the food.

## **3. Describe the intended use and consumers of the food**

Next, the HACCP team needs to describe the normal expected use of the food. The intended consumers may be the general public or a particular segment of the population (e.g., infants, immunocompromised individuals, the elderly).

#### 4. Develop a flow diagram that describes the process

The purpose of a flow diagram is to provide a clear, simple outline of the steps involved in the process, the scope of which must cover all the steps in the process that are directly under the control of the establishment. In addition, the flow diagram can include steps in the food chain that occur before and after the processing that occurs in the establishment.

#### 5. Test and apply the HACCP principles

The final step consists of multiple elements relating back to the foundational principles of HACCP. This includes:

##### Identify and analyze hazards

Effective hazard identification and hazard analysis are the keys to a successful HACCP plan. All hazards—both potential or previously demonstrated—that may occur in each ingredient and at each stage of the commodity system should be considered. Food safety hazards for HACCP programs have been classified into three types of hazards:

- **Biological:** Typically foodborne bacterial pathogens such as Salmonella, Listeria, and E. coli, also viruses, algae, parasites, and fungi;
- **Chemical:** There are three principle types of chemical toxins found in foods: naturally occurring chemicals, e.g., cyanides in some root crops and allergenic compounds in peanuts; toxins produced by microorganisms, e.g., mycotoxins and algal toxins; and chemicals added to the commodity by humans to control an identified problem, e.g., fungicides or insecticides;
- **Physical:** Contaminants such as broken glass, metal fragments, insects, or stones.

##### Determine critical control points (CCPs)

A critical control point is defined as a step at which control can be applied and is essential to prevent or eliminate a food safety hazard or reduce it to an acceptable level. The potential hazards that are reasonably likely to cause illness or injury in the absence of their control must be addressed when determining CCPs. Examples of CCPs may include thermal

processing, chilling, testing ingredients for chemical residues, product formulation control, and testing products for metal contaminants.

### **Establish critical limits**

A critical limit is a maximum 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. Examples include thorough cooking, metal detection, sieving and filtration, use of approved supplies, and the segregation of raw, ready-to-eat, and allergenic foods.

A critical limit is used to distinguish between safe and unsafe operating conditions at a CCP. Critical limits should not be confused with operational limits, which are established for reasons other than food safety.

### **Establish monitoring procedures**

Monitoring is 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. Monitoring serves three main purposes:

- It's essential to food safety management in that it facilitates tracking of the operation; if monitoring indicates that there is a trend toward loss of control, then action can be taken to bring the process back into control before a deviation from a critical limit occurs;
- It's used to determine when there is loss of control and a deviation occurs at a CCP, i.e., exceeding or not meeting a critical limit; when a deviation occurs, an appropriate and corrective action must be taken;
- It provides written documentation for use in the verification.

### **Establish corrective actions**

Ideal circumstances don't always prevail, and deviations from established processes may occur; thus, an important purpose of corrective actions is to prevent foods that may be hazardous from reaching consumers. Where there is a deviation from established critical limits, corrective actions are necessary.

Corrective actions should include the following elements:

- Determine and correct the cause of noncompliance;
- Determine the disposition of the noncompliant product;
- Record the corrective actions that have been taken;

Specific corrective actions should be developed in advance for each CCP and included in the HACCP plan. As a minimum, the HACCP plan should specify what is done when a deviation occurs, who is responsible for implementing the corrective actions, and that a record will be developed and maintained of the actions taken.

### **Establish verification procedures**

Verification is defined as those activities, other than monitoring, that determine the validity of the HACCP plan and that the system is operating according to the plan. The major infusion of science in a HACCP system centers on proper identification of the hazards, critical control points, critical limits as well as instituting proper verification procedures. These processes should take place when developing and implementing the HACCP plans, and when maintaining the HACCP system.

### **Establish record-keeping and documentation processes**

Generally, the records maintained for the HACCP system should include the following:

- A summary of the hazard analysis, including the rationale for determining hazards and control measures;
- The HACCP plan;
- A list of the HACCP team and assigned responsibilities;
- Description of the food, its distribution, intended use, and consumer;
- Verified flow diagram;
- HACCP plan summary;
- Support documentation such as validation records;
- Records that are generated during the operation of the plan.

## Leveraging third-party help for your food manufacturing plant

The government and other organizations have put food manufacturers under a microscope in an effort to ensure they're following food safety standards and complying with regulations. Although practices that ensure safety, quality, and consistency may require an initial investment, they pay off in the long run. After all, the Food Marketing Institute and Grocery Manufacturers Association estimate that the average cost of a recall for food companies is \$ 10 million.

Reaching out to a third-party organizations can be a wise option to help develop an HACCP plan for your food manufacturing business.

---

**Readers may please note that D. L. Shah Trust brings out two e-journals on a fortnightly basis. These are mailed to those persons or institutions who are desirous of receiving them:**

**These two e-journals are:**

- 1. Safety Info**
- 2. Quality Info**

**If you or your friends or colleagues wish to receive these journals, you may send us an email requesting for the same. There is no charge for these journals. Our e-mail address is:**

[dlshahtrust@yahoo.co.in](mailto:dlshahtrust@yahoo.co.in) or [haritaneja@hotmail.com](mailto:haritaneja@hotmail.com) or [dlshahtrust@gmail.com](mailto:dlshahtrust@gmail.com)

**You can also access these journals on our website: [www.dlshahtrust.org](http://www.dlshahtrust.org)**

**Published by : D. L. Shah Trust,  
Room No. 16, 1<sup>st</sup> Floor, Gool Mansion,  
Homji Street, Mumbai 400 001  
email: [dlshahtrust@yahoo.co.in](mailto:dlshahtrust@yahoo.co.in)  
Ph: 022-22672041  
Subscription: Free on request  
(soft copy only)**

**Edited by : Hari K Taneja, Trustee,  
D. L. Shah Trust  
email: [dlshahtrust@gmail.com](mailto:dlshahtrust@gmail.com)  
Phone: 022-2309 6529  
Subscription: Free on request  
(soft copy only)**