C H A P T E R 6

Introduction to Hazard Analysis and Critical Control Point (HACCP)

In this chapter, find answers to the following questions:

Introduction to Hazard Analysis and Critical Control Point (HACCP)

What is HACCP?

The Hazard Analysis and Critical Control Point (HACCP) system describes a preventative process to reduce the risk of foodborne illness through proper food handling, monitoring of procedures, and record keeping. HACCP is a food safety system that focuses on food. A food safety system should focus on controlling five risk factors. The risk factors are foods from unsafe sources, poor personal hygiene, inadequate cooking, improper holding temperature, and contaminated equipment.

To carry out HACCP successfully, a foodservice operation will need to make an individualized HACCP plan. This plan is developed around seven principles. This chapter presents an introduction and overview of the seven principles of HACCP.

HACCP focuses on prevention of foodborne illness at every step as food flows through the process—from purchasing through serving.

- HACCP helps identify foods and procedures that are most likely to cause foodborne illness.
- HACCP helps develop procedures to reduce the risk of foodborne illness.
- HACCP helps monitor the use of procedures to keep food safe.
- HACCP helps verify that the food served is safe to eat.

Before HACCP can be implemented, every foodservice organization should have basic food safety procedures in place. Using the HACCP principles will improve a food safety program, but HACCP can only be established in a foodservice operation that already has:

- employees who have good personal hygiene,
- a facility that is well designed so it can be kept clean and sanitary,
- vendors who provide safe food when delivered,
- food specifications that require food safety measures,
- a routine cleaning and sanitation program, and
- an equipment maintenance program.

Chapters 1 through 5 provide information that foodservice personnel need to establish basic food safety procedures.

The written HACCP plan for a specific foodservice is developed using the seven basic HACCP principles. To develop the HACCP plan, the foodservice personnel analyze and develop food safety processes beginning with the menu and including the facility and equipment, foodservice processes and operations. A complete explanation of how to develop a HACCP plan is beyond the scope of *Serving It Safe*, but the seven principles are presented and explained.

Seven Principles of HACCP

1. ***Identify Hazards***
2. ***Identify Critical Control Points***
3. ***Establish Critical Limits***
4. ***Establish Monitoring Procedures***
5. ***Establish Corrective Actions***
6. ***Establish Verification Procedures***
7. ***Establish Record Keeping Procedures***

The seven principles of HACCP can be used during the eight-step foodservice process to help prevent foodborne illness. Ways to prevent foodborne illness in each of the eight steps were described in Chapter 5.

How can the HACCP principles be used to prevent foodborne illness?

The highest priority for a foodservice manager is the protection of customers by serving safe food. To meet this responsibility, the following tasks are considered best practice.

- Identify the food and procedures that are most likely to cause foodborne illness.
- Develop procedures to reduce the risk of a foodborne illness outbreak.
- Monitor how the procedures are used to keep food safe.
- Verify that the food served is safe to eat.

Using HACCP will help foodservice personnel *identify* places in the food preparation process associated with potentially hazardous foods where bacterial contamination, survival, and growth can occur. HACCP is based on the understanding that if the raw ingredients are safe and the process is safe, then the finished product is safe.

HACCP Principle 1: *Identify Hazards*

To assess the hazards present at each stage of the preparation process, *track each food* from purchasing and receiving through serving and reheating.

- Review menus. Identify all potentially hazardous foods on the menu because they are especially vulnerable to food safety problems during the foodservice process. For each food on the menu, think about where and how it could become contaminated (microorganisms, chemical, or physical contaminants) during the foodservice process.

Menu items served on a school menu could be grouped by the way the foods are processed.

Group 1: Menu items prepared and served without cooking. School menus include such as items as green salads and other fresh vegetables, meat salads, deli meats, and cheeses.

Group 2: Foods that are prepared and cooked just-in-time for service. School menus include such items as hamburgers, hot dogs and corn dogs, pizza, scrambled eggs, and many other items.

Group 3: Foods that will be prepared, cooked, held, cooled, reheated, and served. School menus include many items in this group such as scratch-prepared main dishes like spaghetti, tacos, baked turkey, soups, gravies, and sauces.

For each food, ask, "What are the hazards that could cause a foodborne illness in this step?" Be aware that every step may not be present in every food prepared.

Step 1: Purchasing
Step 2: Receiving
Step 3: Storing
Step 4: Preparing
Step 5: Cooking
Step 6: Holding and Serving
Step 7: Cooling
Step 8: Reheating

- When a foodservice routinely serves potentially hazardous food, the risk of foodborne illness can be reduced by clearly identifying hazards at each of the eight steps. Where there is a concern for contamination or violation of the time-temperature relationship principle, plan a control measure to keep food out of the temperature danger zone. For example, since tuna salad sandwiches are a potentially hazardous food and must sometimes be transported and held before being served, consider ways to maintain the food at proper temperature.
- After the foods on the menu have been surveyed, evaluate general preparation, cooking, chilling, and holding procedures. Next, rank these hazards in terms of severity (how serious are the consequences) as well as probability (how likely are they to occur).

EXAMPLE

Chicken Fajitas (USDA Recipe D-40)

This example describes potential hazards that could cause foodborne illness during the preparing, cooking, holding and serving, and cooling process of chicken fajitas.

Step 4 PREPARING

What are the hazards that could cause a foodborne illness during this step?

Answer(s):

- Improper thawing of chicken
- Improper temperature control of chicken
- Cross-contamination of chicken juices

Step 5 COOKING

What are the hazards that could cause a foodborne illness during this step?

Answer(s):

- Improper cooking – chicken not cooked to required safe internal temperature for appropriate time (165 °F for 15 seconds minimum)
- A thermometer is not used to check temperature

Step 6 HOLDING AND SERVING

What are the hazards that could cause a foodborne illness during this step?

Answer(s):

- Food left in temperature danger zone (41 °F to 135 °F)
- Hand-to-food contact

Step 7 COOLING

What are the hazards that could cause a foodborne illness during this step?

Answer(s):

- Food is not chilled from 135 °F to 70 °F within 2 hours and is not reheated to 165 °F for 15 seconds.
- Food is not placed in shallow pans for rapid cooling.
- A thermometer is not used to check temperature.

Step 8 REHEATING

What are the hazards that could cause a foodborne illness during this step?

Answer(s):

- Food is not reheated to 165 °F for 15 seconds.
- A thermometer is not used to check temperature.

HACCP Principle 2: *Identify Critical Control Points*

Identify the Critical Control Points in the process where *hazards can be controlled or prevented*. Develop a flowchart or list the steps involved in preparing each potentially hazardous food. Then, identify *procedures* to prevent, reduce, and eliminate recontamination hazards at each step. The *Food Code* defines a Critical Control Point (CCP) as a point or procedure in a specific food system where loss of control may result in an unacceptable health risk.

In the example of Chicken Fajitas, control should be achieved over specific steps such as cooking, cooling, holding, and reheating.

HACCP Principle 3: *Establish Critical Limits*

In order to be sure a food passes safely through a critical control point, Critical Limits should be established. These Critical Limits (CL) are standards that are observable and measurable and are usually specified by using temperature and time. Other Critical Limits that might be used include pH, humidity, salt concentration, or available chlorine.

Specify exactly what should be done to meet each particular standard (Critical Limit). For example, instead of stating that a "food must be thoroughly cooked," the standard should state, "Heat rapidly to a required safe internal temperature of 165 °F for 15 seconds."

In addition

- Provide food thermometers, teach employee how to calibrate and use them correctly, and ensure that they use them routinely.
- On recipes: (1) indicate end-state cooking, reheating, and hot-holding temperatures; and (2) specific times for thawing, cooking, and cooling foods.
- Provide directions for handling leftovers.
- Schedule sufficient staff in peak hours to prepare and serve foods safely.

HACCP Principle 4: *Establish Monitoring Procedures*

Using the established Critical Limits for your operations, monitor potentially hazardous foods at every step in the foodservice process. Compare what actually happens during the foodservice process with the standards that have been established. Identify any areas of deficiency outside the limits established. The manager should be actively involved in monitoring as well as selecting employees who should be taught on how to monitor.

In the example of the Chicken Fajitas, monitoring a Critical Control Point would be described as, "When the chicken reaches a required safe internal temperature of 165 °F, it is then held in the holding cabinet at or above 135 °F until time for service. The cook has been taught to monitor this product. The internal temperature of the product will be checked and recorded every 30 minutes on the hour and half-hour during holding."

HACCP Principle 5: *Establish Corrective Action*

If the Critical Control Point does not meet the pre-determined Critical Limits, corrective action is needed. The corrective action should be pre-determined as part of the HACCP plan for the foodservice organization.

This HACCP principle can be illustrated with the Chicken Fajitas as follows: "When the internal temperature of the Chicken Fajitas is checked every 30 minutes during holding, if the temperature is 135 °F or above, no action is needed. The food is safe to eat. If the temperature is below 135 °F, corrective action is needed. The length of time out of the proper temperature determines the corrective action. The corrective action would be to reheat the Chicken Fajita mixture to 165 °F for 15 seconds and return it to the holding cabinet or place it on the service line."

Examples of corrective action:

If… Product temperatures are unacceptable when received—
Reject the shipment.

If… Food is contaminated by hands or equipment—
Re-wash fresh, whole fruit/vegetable or discard the food.

If… Temperature is not high enough after cooking—
Continue cooking to the required safe internal temperature for the appropriate time, and then test with a food thermometer.

HACCP Principle 6: *Establish Verification Procedure*

Verify that the HACCP process in the foodservice works. If an operation does not have documentation that demonstrates effectiveness of these programs and practices, HACCP cannot be implemented. Below are some ways to verify the HACCP process is effective.

- Be alert to how often corrective actions are needed. If corrective actions are needed frequently, this may indicate a need to change, or at least fine-tune, the HACCP system.
- Think of tests that can be done, like measuring the strength of the sanitizing solution with a sanitizer test strip. Also, examine records and make sure employees are entering actual, valid data.
- Use the routine inspection by the State public health department to provide an assessment of whether the HACCP process is working.

HACCP Principle 7: *Establish Record Keeping Procedures*

Establish a record keeping system to document the HACCP process and monitor results. This may be any simple, quick system, such as a printed temperature forms in which employees can record their compliance with standards at Critical Control Points. Sample temperature forms are provided in Appendix 3 – Daily Temperature Form – Internal Food Temperatures, and Appendix 4 – Storage Temperature Form.

Written records are extremely important and may provide proof that a foodborne illness *did not* originate in the kitchen. Records will also help continue to improve sanitation procedures and the HACCP system.

The example below describes how HACCP principles can be applied to prevent foodborne illness in each of the eight steps of the foodservice process. For each step, HACCP Application Points are described. Read the example to see how this kind of process could be helpful in a school kitchen to ensure safe food preparation and service. Each HACCP Principle may not be present in every step.

Foodservice Process Example with HACCP Application Points Oven Fried Chicken

Step 1 PURCHASING

Purchase frozen chicken pieces from a reputable supplier who runs a safe and sanitary operation.

HACCP Application:

Principle 1: ***Identify Hazards*** – Determine whether the supplier runs a safe and sanitary operation.

Step 2 RECEIVING

When frozen chicken is unloaded from the truck, make sure it is frozen hard. The chicken should be rejected if there is any evidence of thawing (softness or fluids in the case) or evidence it has been refrozen (excessive ice crystals).

HACCP Application:

Principle 1: ***Identify Hazards*** – Visually assess whether the frozen chicken meets safe food requirements.

Principle 3: ***Establish Critical Limits*** – The chicken should be frozen solid with no visual evidence of previous thawing.

Principle 4: ***Establish Monitoring Procedures*** – Employee responsible for receiving should document that the chicken is frozen solid with no visual evidence of previous thawing.

Principle 5: ***Establish Corrective Action*** – If chicken is partially thawed or the box shows evidence of partial thawing and refreezing, the chicken should be rejected.

Step 3 STORING

Store the chicken in the refrigerator to maintain a required safe internal temperature at 41 °F or below while it thaws. Thaw on a shelf below prepared or ready-to-eat foods.

HACCP Application:

Principle 2: ***Identify Critical Control Points*** – Refrigerated storage

Principle 3: ***Establish Critical Limits*** – The required safe internal temperature of the thawed chicken should be at or below 41 °F.

Principle 4: ***Establish Monitoring Procedures*** – Monitor the internal temperature of the thawed chicken.

Step 4 PREPARING

Wash hands before and after handling the chicken. Coat the chicken in breading immediately before cooking.

HACCP Application:

Principle 2: ***Identify Critical Control Points*** – Refrigerated storage

Principle 3: ***Establish Critical Limits*** – The required safe internal temperature of the thawed chicken should be at or below 41 °F.

Principle 4: ***Establish Monitoring Procedures*** – Monitor the internal temperature of the thawed chicken.

Step 5 COOKING

Cook the chicken in the oven to a required safe internal temperature of 165 °F for 15 seconds.

HACCP Application:

Principle 2: ***Identify the Critical Control Points*** – Cooking process

Principle 3: ***Establish Critical Limits*** – The required safe internal temperature of the cooked chicken should be at or above 165 °F for 15 seconds. If the chicken is not at this temperature, continue cooking until the temperature is reached for the required time.

Principle 4: ***Establish Monitoring Procedures*** – Monitor the internal temperature for 15 seconds.

Step 6 HOLDING AND SERVING

Hold the chicken on a service line or a holding cabinet at a required safe internal temperature of 135 °F or above. When serving, use tongs or gloved hands to avoid touching the chicken with bare hands.

HACCP Application:

Principle 2: ***Identify Critical Control Points*** – Holding and Serving process

Principle 3: ***Establish Critical Limits*** – The required safe internal temperature of the cooked chicken should be at or above 135 °F.

Principle 4: ***Establish Monitoring Procedures*** – Monitor the internal temperature every 30 minutes during holding and serving.

Step 7 COOLING

Cool leftover chicken in the refrigerator in a shallow container to a required safe internal temperature of 41 °F or less.

HACCP Application:

Principle 2: ***Identify Critical Control Points*** – Chilling process

Principle 3: ***Establish Critical Limits*** – Chill cooked hot food from 135 °F to 70 °F within 2 hours and from 70 °F to 41 °F in an additional 4 hours for no more than a total cooling time of 6 hours. If the food has not reached 70 °F within 2 hours, it must be reheated immediately to 165 °F for 15 seconds.

Principle 4: ***Establish Monitoring Procedures*** – Monitor the internal temperature at the stated time intervals.

Step 8 REHEATING

Reheat to a required safe internal temperature of at least 165 °F.

HACCP Application:

Principle 2: ***Identify Critical Control Points*** – Reheating process

Principle 3: ***Establish Critical Limits*** – Reheat to a required safe internal temperature of at least 165 °F for 15 seconds.

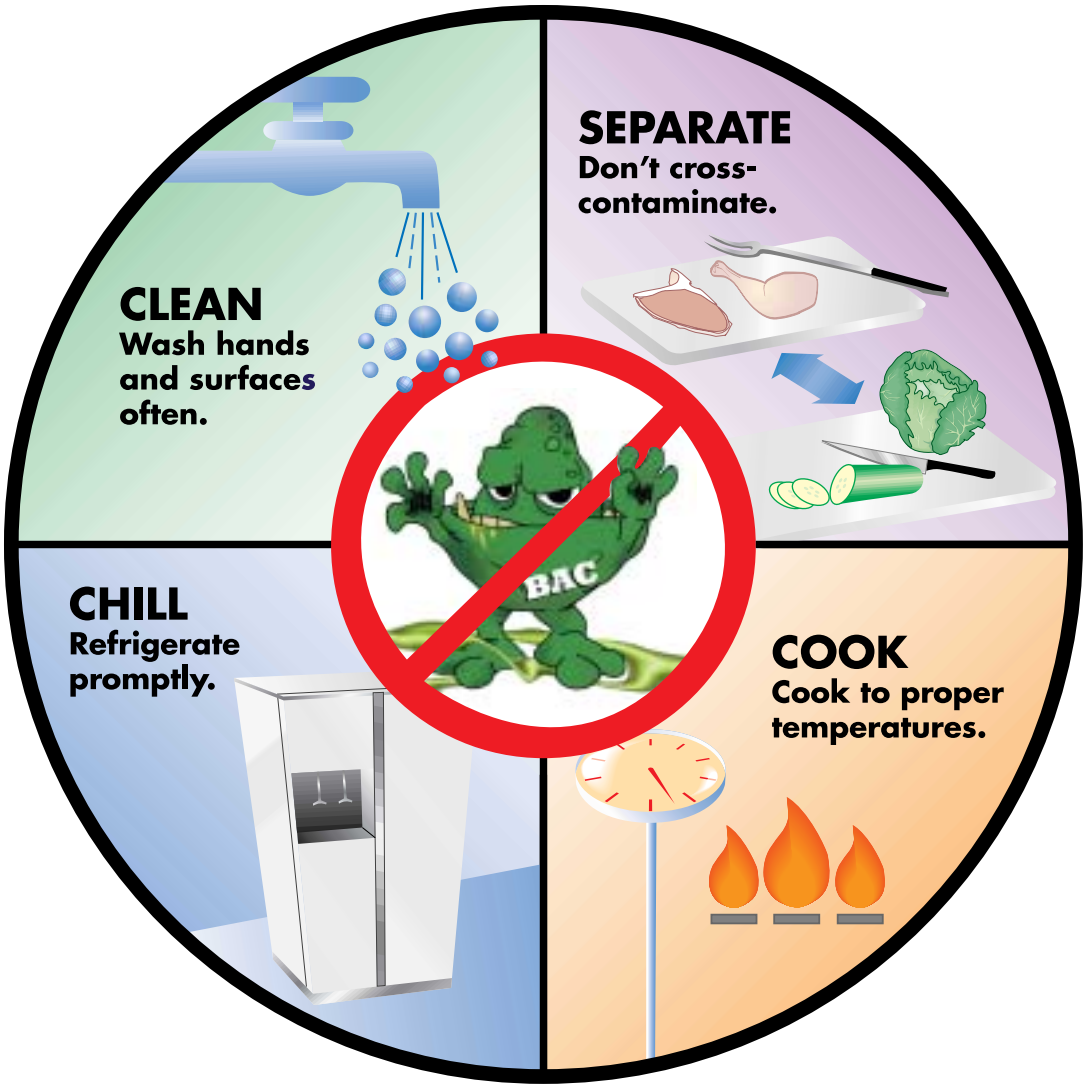
Principle 4: ***Establish Monitoring Procedures*** – Monitor the internal temperature for 15 seconds.

How can employees be trained to use HACCP?

Foodservice employees should be trained on all aspects of safe food handling. Using the HACCP process is an added way to ensure optimal food safety. Contact the State or local public health department for further information on implementing HACCP.

Summary

Hazard Analysis and Critical Control Point (HACCP) system is a way to keep food safe as it moves through the foodservice processes. It is based on the concept of preventing a foodborne illness and ensuring safer food products. A HACCP plan is a written document developed for a specific foodservice that describes the food safety procedures to be followed. Seven Principles of HACCP: 1. *Identify Hazards;* 2. *Identify Critical Control Points;* 3. *Establish Critical Limits;* 4. *Establish Monitoring Procedures;* 5. *Establish Corrective Actions;* 6. *Establish Verification Procedures;* 7. *Establish Record Keeping Procedures.* The HACCP plan is developed using seven principles of HACCP and is specific to the menu, the facility and its equipment, and the foodservice processes used. For specific foods on the menu, it describes food safety procedures for proper food handling and how the procedures will be monitored and documented (record keeping).


CLEAN
Wash hands and surfaces often.
SEPARATE
Don't cross-contaminate.
BAC
CHILL
Refrigerate promptly.
COOK
Cook to proper temperatures.