

LESSON PLAN

1. FOOD SERVICE SUPERVISOR/MANAGER CERTIFICATION

Topic 1.6 HAZARD ANALYSIS AND CRITICAL CONTROL POINTS

Class periods: 3

Lab periods: 0

Enabling Objectives:

Instructor Preparation:

1.23 **UNDERSTAND** background information and terminology relating to HACCP

A. Review Assigned Trainee Material

1.24 **DESCRIBE** the hazard analysis process

B. Reference Publications:

1.25 **UNDERSTAND** criteria used to determine a Critical Control Point and Critical Limits

1. HACCP Regulatory Applications in Retail Food Establishments Manual

1.26 **UNDERSTAND** the flow of food within a facility and how it relates to a HACCP Plan

2. NAVMED P-5010, Chapter 1

1.27 **DESCRIBE** various methods to monitor a HACCP plan and associated record keeping responsibilities

C. Training Materials Required:

1.28 **UNDERSTAND** the process of verifying the HACCP process

1. Power Point Presentation

1.29 **UNDERSTAND** a HACCP plan given a sample menu

2. Blank sample HACCP menu

Trainee Preparation Material:

A. Trainee Support Materials:

1. Student Workbook

B. Reference Publications: None

1. Introduction

1. Establish Contact.

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Introduce yourself and give any background on yourself that might be of interest.

Establish readiness.

Motivating Statements.

Tell the trainees how they will use the course material.

Tell the trainees why they need to know the lesson material.

Refer to Student Workbook and review objectives.

2. Background information

a. What is HACCP?

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- (1) HACCP is a scientific approach to food safety which analyzes potential hazards, determines the critical control points in a food process and develops monitoring procedures to determine if the hazards identified are being effectively controlled
 - (2) HACCP is a process that treats the storage, preparation and service of food as a continuous system. This system is broken down into logical components and each is evaluated by principles of failure analysis. The premise is simple: if each step of the process is carried out correctly, the end product will be safe food
 - (3) HACCP focuses on foods most likely to cause illness; monitoring foods and procedures; and taking corrective actions
 - (4) HACCP involves identifying and controlling points from receiving to serving at which: food can become contaminated, contaminants can increase and where contaminants can survive
- b. HACCP considers the documented factors which contribute to most outbreaks and uses risk assessment techniques to identify and prioritize

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hazards. Examples include:

- (1) Improper cooling of food
- (2) Inadequate cooking times and temperatures
- (3) Contamination of food by infected FSW, including poor personal hygiene
- (4) Food prepared a day or more prior to serving
- (5) Raw, contaminated ingredients added to foods receiving no further cooking, i.e. lettuce on hamburger or similar raw ingredients
- (6) Foods remaining at unsafe temperatures
- (7) Failure to reheat foods to proper temperatures
- (8) Cross contamination of cooked food with raw foods, or by employees who mishandle food or improperly cleaned equipment

3. Definitions:

- a. Acceptable level: the presence of a hazard

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which does not pose the likelihood of causing an unacceptable health risk

- b. Critical Control Point(CCP): any point in a specific food system at which control can be applied, and a food safety hazard can be prevented, eliminated or reduced to an acceptable level
- c. Critical Limit(CL): one or more prescribed standard that must be met to insure that a critical control point effectively eliminates or controls a microbiological hazard
- d. Deviation: failure to meet a required critical limit for a critical control point
- e. HACCP Plan: the written document which delineates the formal procedures to be followed in accordance with acceptable HACCP principles
- f. Hazard: any biological, chemical, or physical property that may cause an unacceptable consumer health risk (ex: bacterial contamination, survival of bacterial contaminants)

This standard should be something that can be immediately monitored by measurement or observation, ex: temperature, time, pH

Biological includes: bacteria, viruses, and parasites
Chemical includes: naturally occurring (scrombroid toxins), heavy metals and cleaning agents
Physical includes: bones, staples, metal chips and glass

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- g. Monitoring: a planned sequence of observations or measurements of critical limits designed to produce an accurate record and intended to ensure that the critical limits maintain product safety. Each standard should state specifically
- (1) WHAT is to be monitored
 - (2) HOW it is to be monitored
 - (3) WHO is going to monitor the process
- h. Preventive Measure: any action to exclude, destroy, eliminate or reduce a hazard and prevent recontamination through effective means
- i. Risk: an estimate of the likely occurrence of a hazard or danger
- j. Sensitive Ingredient: any ingredient historically associated with a known microbial hazard, and for which there is reason for concern
- k. Verification: methods, procedures and tests used to determine if the HACCP system in use is in compliance with the HACCP plan. Information is drawn from time/temperature logs and curves, checklists and forms
- Ask: What are some of the PM that should be considered? These measures should be detailed in SOPs, to include: cleaning and sanitizing with approved chemicals; washing of hands; covering food containers; separating raw and cooked products, employee training, and calibration of thermometers
- Ask: What is the difference?
Low risk: products intended to be thoroughly cooked prior to consumption, i.e. frozen fish
Substantial risk: product is not thoroughly cooked prior to consumption, i.e. seafood

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1. Corrective Action: each standard must have a corresponding action, ex: (1) reject product; (2) evaluate product: adjust temperature, move product, cover product; (3) evaluate procedure: wash and rinse, clean and sanitize, redo; (4) discard product

salad items
Clostridium botulinum, and
Vibrio cholerae are labeled
severe hazards while
Clostridium perfringens and
salmonella are moderate
hazards

4. Hazard analysis

- a. The first step in any HACCP plan is to complete a hazard analysis process.
 - (1) Assemble a team composed of individuals who are familiar with the overall food operation and specific production processes
 - (2) The team will:
 - (a) Determine significant food safety hazards
 - (b) Determine risk level
 - 1 Likelihood of occurrence
 - 2 Severity if it occurs
 - (c) Develop preventive measures for hazards to ensure or improve food safety

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(d) Take into consideration:

- 1 Does the food contain any sensitive ingredients that are likely to present microbiological hazards (e.g. salmonella), chemical hazards (e.g. pesticide residue) or physical hazards (e.g. stones, glass)?
- 2 Does the food permit survival or multiplication of pathogens and/or toxin formation in the food before or during preparation?
- 3 Does the preparation process include a controllable step that destroys pathogens or their toxins?
- 4 Does the layout of the facility provide an adequate separation of raw materials from ready to eat?
- 5 Will the equipment provide time/temperature control that is necessary for safe food?
- 6 Is the equipment reliable or is it prone to frequent breakdowns?
- 7 Is equipment designed so that it can be cleaned and sanitized?

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- 8 Can the facility be cleaned and sanitized to permit safe handling of food?
 - 9 Can employee health or personal hygiene practices impact the safety of the food being prepared?
 - 10 Do employees understand the food preparation process and the factors they must control to ensure safe foods?
 - 11 Will there be leftovers?
- (3) When considering CCPs, pay special attention to processes that deal with time and temperature relationships to include:
- (a) Thawing
 - (b) Cooking
 - (c) Hot-holding
 - (d) Cold-holding
 - (e) Cooling
 - (f) Reheating ALSO Consider:

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(g) Employee health/habits

(h) Cross-contamination

b. Developing Preventive Measures:

(1) Definition: Physical, chemical or other factors that can be used to control a hazard

(2) More than one PM may be required to control a specific hazard and more than one hazard may be controlled by a specific PM

Example: Cooking frozen hamburger patties:
HAZARD: enteric pathogens on raw meat

PREVENTIVE MEASURE: cooking sufficiently to kill enteric pathogens

5. Identify the CCPs in Food Preparation

a. Recall that a CCP is a point, step or procedure at which control can be applied and a food safety hazard can be prevented, eliminated or reduced to an acceptable level

b. At this step of preparation, can food be contaminated? contaminants increase? contaminants survive?

c. Can this hazard be prevented through corrective action(s)?

d. Can this hazard be prevented, eliminated, or reduced by steps taken later in the preparation cycle?

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- e. Can you monitor this CCP?
- f. How can you measure this CCP?
- g. Can you document the CCP?
- h. Consider cooking, chilling, specific sanitation procedures, prevention of cross contamination, and various aspects of employee and environmental hygiene
- i. Refer to the CCP Decision Tree Table (1997 Food Code) to determine whether or not an item is a CCP

6. Establish Critical Limits for Preventive Measures

- a. Critical Limits can be thought of as boundaries for safety for each CCP and may be set for preventive measures such as time, temperature, and available chlorine. The CL can be derived from sources such as regulatory standards and guidelines, scientific literature, experimental studies and consultation with experts
- b. Criteria most frequently Used for Critical Limits:
 - (1) Time
 - (2) Temperature

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(3) Humidity

(4) a_w

(5) pH

(6) Acidity

(7) Preservatives

(8) Salt concentration

(9) Available chlorine

(10) Viscosity

7. Establish procedures to Monitor CCPs

a. Recall that monitoring is a planned sequence of observations or measurements to assess whether a CCP is under control and to produce an accurate record for use in future verification procedures

b. The three main purposes of monitoring:

(1) Tracks the system's operation so that a trend toward a loss of control can be recognized and corrective action can be taken to bring the process back under control before a deviation occurs

EX:

Process Step	CCP	Critical Limits
Cooking	YES	Minimum internal temp of patty 155°F Broiler temp: __°F Time: rate of heating/cooling (e.g. conveyor belt speed in ft/min____) Patty thickness: ____inches Patty composition (%fat/filler):__ Oven humidity: ____%RH

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- (2) Indicates when loss of control and deviation have actually occurred, and corrective action must be taken
- (3) Provides written documentation for use in verification of the HACCP plan
- c. Examples of measurements for monitoring include:
 - (1) Visual observations
 - (2) Temperature
 - (3) Time
 - (4) pH
 - (5) a_w
- d. Continuous monitoring
 - (1) Measure food temperatures with a calibrated thermometer (records of calibration are required for HACCP Plan)
 - (2) Results are recorded on log sheets
 - (a) If time/temp is insufficient, the batch must be recorded as "process deviation" and reprocessed or discarded

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| <ul style="list-style-type: none">(3) If continuous monitoring schedule is not possible, use a reliable interval to maintain control over the hazard(4) Compensate for variation in temperatures(5) Assignment of responsibility for monitoring, usually the PIC, chefs or departmental supervisors<ul style="list-style-type: none">(a) Must receive training in monitoring technique(b) Understand the purpose and importance of monitoring(c) Have access to CCP and calibrated instrumentation(d) If CL is not met, ensure immediate corrective action takes place(e) Be unbiased in monitoring and recording procedures to ensure accuracy. Sign or initial records/documentse. Random checks used to supplement the monitoring of certain CCPs<ul style="list-style-type: none">(1) Check incoming ingredients | <p>For example, if a product must be cooked to 155°F or higher for product safety, the minimum temperature of the product may be set at a target that is above this temperature to compensate for variation.</p> |
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- (2) Equipment working properly
- (3) Cleaning and sanitizing procedures

8. Establish the corrective action to be taken when monitoring shows that a CL has been exceeded
- a. HACCP is a system intended to prevent deviations from occurring, however, perfection is rarely achieved. Thus a corrective action must be in place to:
 - (1) Determine the disposition of the food that was produced when a deviation was occurring
 - (2) Correct the cause of the deviation and ensure that the critical control point is under control
 - (3) Maintain records of corrective actions
 - b. When you find a standard for a CCP is not being met, **correct it right away**. Many corrective actions are very simple, such as continuing to heat an item if the end cooking temperature has not been reached. Other corrective actions may not be as simple, such as discarding the food item

(1) Example: The standard for holding baked chicken may read, "Hold baked chicken at 140°F or higher until served"

The corrective action if the standard is not met may read, "If held over two hours, discard. If held less than two hours and temperature falls below 140°F, reheat to 165°F or higher for at least 15 seconds-one time only."

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9. Establish effective record keeping systems that document the HACCP system
 - a. The written HACCP plan
 - (1) Must detail the hazards of each individual or categorical product covered by the plan
 - (2) Must clearly identify the CCPs and corresponding CL
 - (3) Must include CCP monitoring and record keeping procedures
 - b. Record keeping
 - (1) The approved HACCP plan and associated records must be kept on file at the food establishment. The following are examples of documents that can be included in the total HACCP system:
 - (a) HACCP team members and responsibilities
 - (b) Product description and its intended use
 - (c) Flow diagram food preparation indicating CCP
 - (d) Hazards associated with CCP and PMs

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- (e) Critical limits
- (f) Monitoring system
- (g) Corrective actions for deviations
- (h) Record keeping procedures
- (i) Verification procedures

c. Basic tips for a record keeping system:

- (1) Blank forms and a clip board near work areas to check several items at the same time
- (2) Notebooks to write down what actions have been taken
- (3) All flowcharts and recipes near work areas, so employees can use them quickly
- (4) Blank forms for temperature hung on equipment for easy use

10. Establish procedures to verify that the HACCP system is working

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- a. Once your procedures are in place, you need to follow the flow of food to ensure what plan you have decided upon is correct. Verification procedures may include:
 - (1) Establishment of verification inspection schedules
 - (2) Review of HACCP plan and/or modifications
 - (3) Review of CCP and corresponding records
 - (4) Review of deviations and their resolution, including disposition of food
 - (5) Visual inspections of operations to observe if CCPs are under control
 - (6) On site review and verification of flow diagrams
- b. Verification inspections should be conducted:
 - (1) Routinely or unannounced to ensure CCPs are under control
 - (2) When new information is publicized in the food safety arena
 - (3) Immediately following a foodborne illness

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- (4) On a consultative basis, resources permitting
 - (5) If established criteria have not been met
 - (6) To verify that changes have been implemented correctly following HACCP modifications
11. Flow of Food: The HACCP plan must examine each of the following flow points to ensure the end product served to the consumer is safe and wholesome
- a. Receiving: time/temperature relationship product well iced
 - (1) Organoleptic evaluations
 - (2) Labeling product for inventory/FIFO
 - (3) Physical inspection of ingredients
 - b. Storing:
 - (1) Time/temperature
 - (2) Personal hygiene practices
 - (3) Cross contamination

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(4) Inventory/FIFO

c. Preparing:

(1) Thawing process

(2) Pre-chilled ingredients for salads

(3) Batch preparation

(4) Designated areas or equipment

d. Cooking:

(1) Final cooking temperature verified

(2) Internal product temperature check

(3) Type of cooking equipment

(4) Post-cooking contamination

e. Serving:

(1) Time/temperature

(2) Post-cooking contamination

(3) Personal hygiene

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f. Holding:

- (1) Time/temperature verified
- (2) Raw vs. cooked product storage
- (3) Post-cooking contamination

g. Cooling:

- (1) Time/temperature
- (2) Product density
- (3) Container size/type
- (4) Cooling method
- (5) Cross-contamination
- (6) Equipment design

h. Reheating:

- (1) Time
- (2) Temperature verified
- (3) Equipment design

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12. Summary

- a. Background and definitions relating to HACCP
- b. Hazard Analysis Process
- c. Critical Control Points and Critical Limits
- d. Flow of food within the facility as it relates to HACCP
- e. Monitoring process and record keeping
- f. Verification of a HACCP plan