Environmental Field Investigations of Foodborne Illness Outbreaks

Guidelines for the Local Environmental Health Specialist

Introduction

- The field investigation guidance document is intended to
  - *assist the local EH program in the investigation of foodborne illness outbreaks*
  - *Improve the local EPI Team*

Assumptions

- The FBI Outbreak has begun:
  - Epi team has be activated
  - Case definition has been established
  - Case interviews have begun
  - Onset time, duration obtained
  - Line listing created
  - Epi curve created
  - Hypothesis formulated
  - Clinical samples taken and analyzed
  - Case-Control or Cohort Study performed

What is a Field Investigation?

- A field investigation consists of:

  a comprehensive evaluation of the foodhandling practices that may have occurred at the suspected outbreak source during the hours (or days) leading up to the time of the potential exposure.

What is the Purpose?

- The purpose of a field investigation is:

  to determine the improper food handling practices and/or implicated food that may have contributed to the foodborne illness outbreak.

Why is it important?

- A field investigation is important for two reasons:

1) *to control the spread of the illness during the current outbreak*
2) *to serve as an important educational tool to prevent similar outbreaks in the future.*

When should it be done?

- The epidemiological investigation suggests a common source exposure and
- The source is a particular food service establishment or gathering

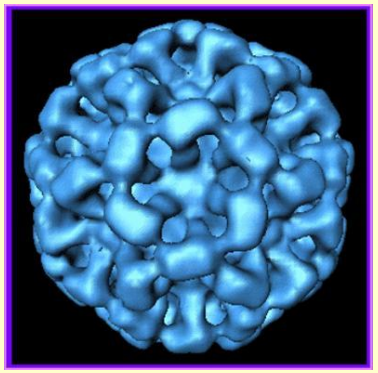
** NCDA & CS will investigate if the source of contamination occurs prior to the point of retail food preparation (e.g. manufacturer, supplier, distributor, etc.)

Conducting the Investigation

- An effective field investigation will look at all aspects of the establishment's practices, such as:
  - *Foodhandling*
  - *Food storage*
  - *Food storage temperatures*
  - *Food safety knowledge*
  - *Employee health*
  - *Cleaning and sanitizing*

Where to begin…

- Begin the field investigation based upon the Epi data
  - *Suspected foods* *(case-control, cohort studies)*
  - *Specific pathogen* *(confirmed or suspected)*



Control Measures and Sampling

- Initiate control measures if suspected contaminated food is available:
  - *Obtain samples for analysis*
    - *Food*
    - *surface*
  - *Prevent further service*
    - *Voluntary disposal*
    - *embargo*

Sampling Protocols

- **Appendix B:**

  Sampling Protocol for Foodborne Outbreak Field Investigations

Records Review

- Focus on problem practices after reviewing:
  - *Complaint records*
  - *Past inspection forms*

Interviews

- Communication is a key ingredient to a successful field investigation!
  - *Manager*
  - *Employees*

Interviews

- Managers
  - *Menu Items*
  - *Number of people served*
  - *Employees responsible for preparation*
  - *Procedures used to prepare menu items*
  - *Ill Employees*
  - *Unusual circumstances*

    (Larger than normal event, malfunctioning equipment, etc.)

Interviews

- Employees
  - *Menu items prepared*
    - *Who? What? How? When? Where?*
  - *Preparation procedures actually used*
  - *Illnesses (worker and family members)*
  - *Unusual circumstances that break from the typical routine*

Flow Diagrams

- Can help identify shortfalls in recipes that could result in an “out of control” hazard
- Uses the recipe and/or other written/unwritten prep procedures to group food flow into major operational steps

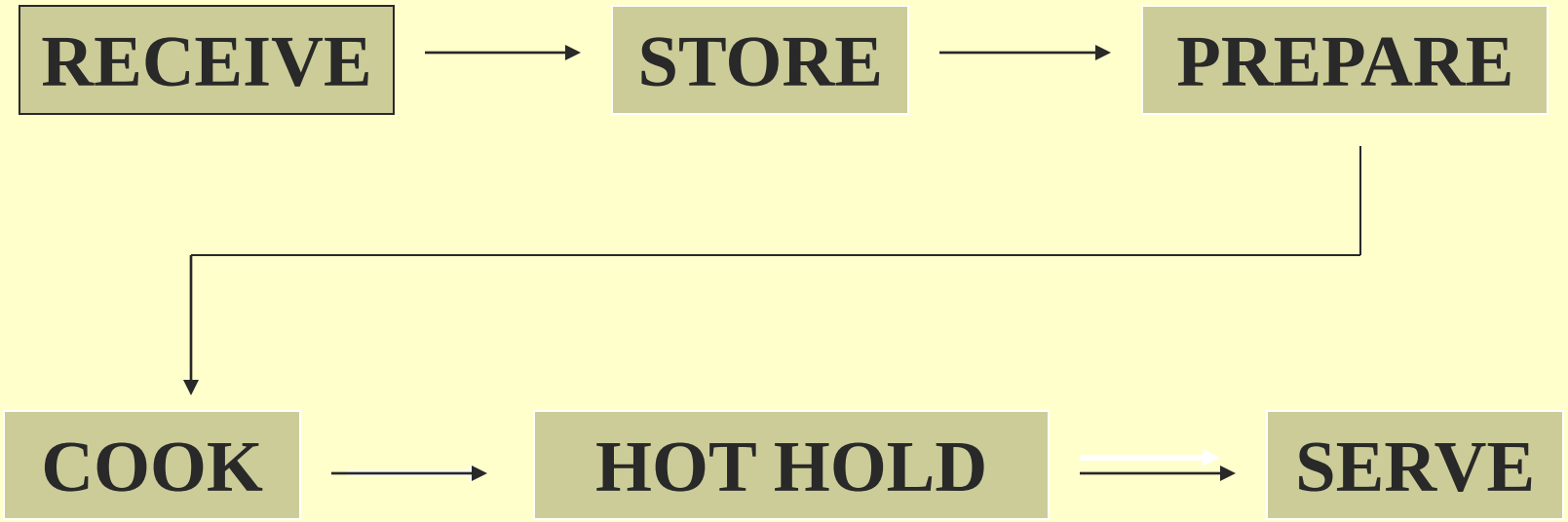
Example: Fried Pork Chops

- Pre-cut chops are received frozen and stored in walk-in until thawed
- Chops are rinsed with water, then dipped in flour/spice mix
- Chops are deep fried for 15 minutes at 400^{o} F.

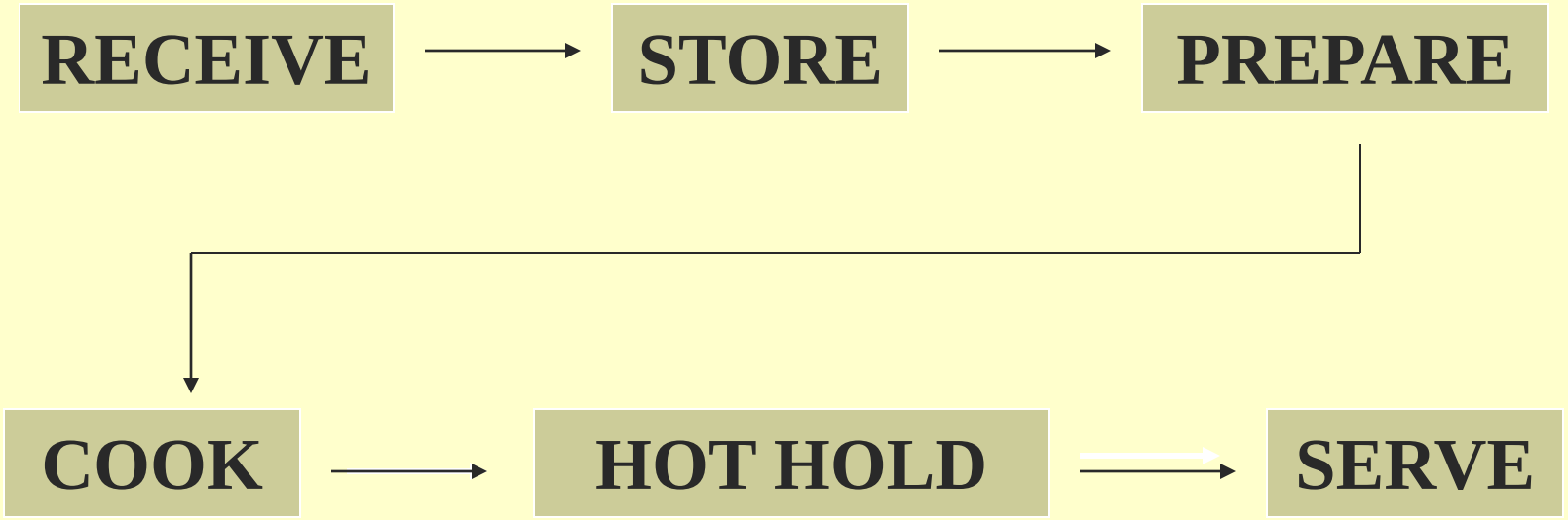
Example: Fried Pork Chops

- Chops are placed on metal sheet pan and placed under a heat lamp/steam table until served.
- Chops are placed on clean plates using tongs when ordered and are immediately picked up by wait staff.

Flow Chart for Fried Pork Chops



Conduct a Hazard Analysis



Where in the flow of food can hazards occur?

What can go wrong??

Where in the facility were the steps completed?

Sources of Food

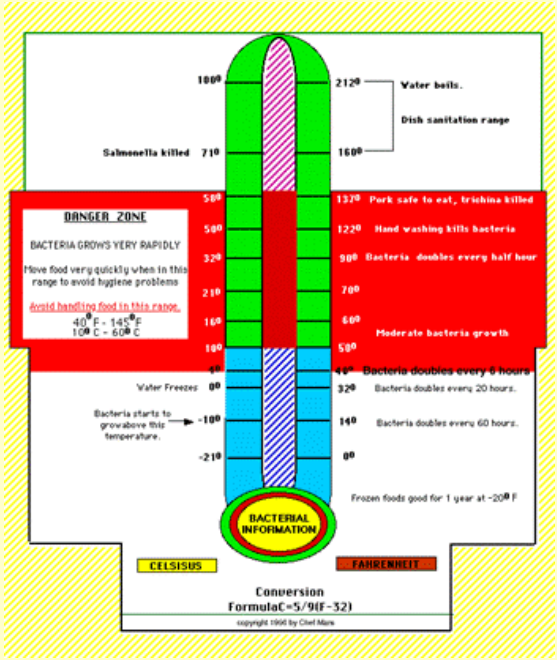
- All food products used within a food service establishment must originate from a source that falls within the regulatory laws and rules of North Carolina.
  - *Meat & Poultry Products: USDA, NCDA*
  - *Packaged Foods: FDA, NCDA*

Unapproved Sources of Food

- Meat & poultry products with no mark of inspection
  - *Where did they come from??*
- Products that do not meet U.S. requirements
  - *Labeling*
  - *Inspection*

Time/Temperature Abuse

- Receiving Temperatures
- Cold Holding
- Preparation Time
- Hot Holding
- Cooling
- Reheating



Are records available for review?

Final Cooking Temperatures

Assess:

- *Knowledge of manager and cook*
- *Method of final cooking temperature assessment*
- *Type of thermometer used*
- *Calibration of thermometer*
- *Records*

Cross Contamination

- Flow of food
  - *Biological pathogens*
  - *Chemical contaminants*
  - *Physical contaminants*
- Standard Operating Procedures (SOPs)
  - *Assess the level of control*

Employee Health

- Prevention of viral-related FBI Outbreaks:
  - *No bare-hand contact*
  - *Employee health policy*
  - *Handwashing*

Employee Health Policy

- Does the establishment have an employee health policy that addresses:
  - *Employee illnesses*
    - *Sore throat with fever*
    - *Vomiting*
    - *Diarrhea*
  - *Disclosure of illnesses*
  - *Exclusion and restriction*

Ill Employees

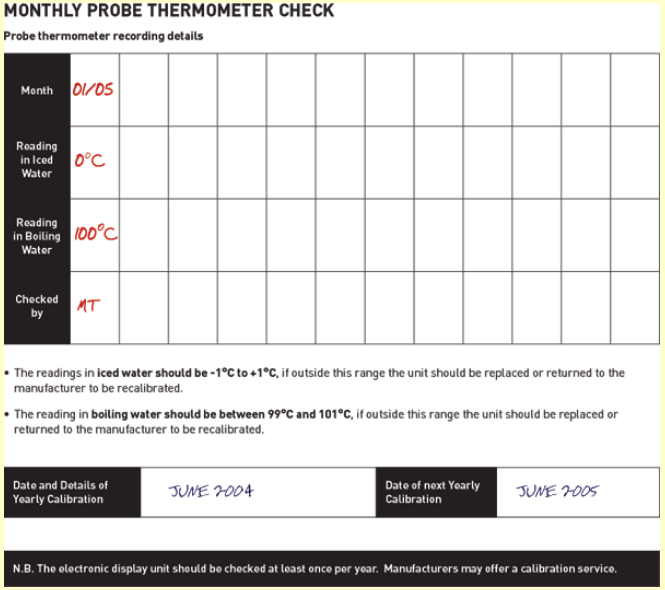
- If food has been prepared by symptomatic employees (diarrhea, vomiting, sore throat with fever), the food is considered contaminated!
  - *Statistical analysis may not be necessary*
  - *Control of remaining food*
    - *Embargo*
    - *Voluntary disposal*

Cleaning & Sanitizing

- Food contact surfaces, utensils, and equipment
- Proper use of sanitizers
- Standard Operating Procedures (SOPs)

Records

- Provide insight into daily activities
- Examples of records
  - *Time/Temperature Logs*
    - *Refrigeration*
    - *Final cooking temperatures*
    - *Cooling*
    - *TILT*
  - *pH Logs*
    - *Sushi rice*
  - *Invoices*



MONTHLY PROBE THERMOMETER CHECK

Probe thermometer recording details

Month	01/05											
Reading in Iced Water	0°C											
Reading in Boiling Water	100°C											
Checked by	AT											

- The readings in **iced water should be -1°C to +1°C**, if outside this range the unit should be replaced or returned to the manufacturer to be recalibrated.
- The reading in **boiling water should be between 99°C and 101°C**, if outside this range the unit should be replaced or returned to the manufacturer to be recalibrated.

Date and Details of Yearly Calibration	JUNE 2004	Date of next Yearly Calibration	JUNE 2005

N.B. The electronic display unit should be checked at least once per year. Manufacturers may offer a calibration service.

Invoices

- Can provide info such as
  - *source of sale*
  - *manufacturer*
  - *lot and product codes*
- Useful for identification or traceback purposes
  - *(e.g. product recalls)*

Concluding the Investigation

- Control measures

#1 Priority!

  - *Contaminated food*
    - *Voluntary disposal*
    - *Embargo for sampling*
  - *Contaminated surfaces*
    - *Clean and disinfect*
    - *Sample if needed before cleaning, disinfecting*
  - *Ill employees*
    - *Exclude or restrict*

Concluding the Investigation

- Documentation
  - *Complete*
  - *Copies of all forms used*
- After-action meeting
  - *Lessons learned*
  - *improvements needed*

Questions?

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