

# Food Safety in Healthcare Settings

*Parkland Health & Hospital System*

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## What's Wrong with this Picture?



- Steps for an Outbreak investigation
- Infection Prevention rounding in the kitchen
- Resources for rounding in the kitchen
- Risks in the kitchen
- Hand hygiene in the kitchen
- Cleaning and Sanitizing
- Pests and Control Measures

It is Thursday, November 7  
at 3:00 pm...

...You receive a call from the hospital lab. The Director tells you that they have identified 7 positive shiga-toxin producing E. coli stool specimens collected within a 3 day period. He informs you that this is an abnormal number to see in a short time period.

- Do you have an outbreak?
- Define and identify your cases.
- Generate hypothesis for cause of illness.  
(person, place, time)
- Test the hypothesis



## What you know

- The lab usually sees similar number of positive Shiga toxin producing E. coli results in 6 months.
- The earliest collection date for these specimens was on Nov. 2.
- Read about E. coli in the Control of Communicable Diseases Manual
  - 2-10 day incubation
- A case is defined as any person at ABC Hospital with a positive stool culture for E. coli. since October 24.

## Next Step

- Create a line list to characterize the situation



## Line List

MRN	Age	Sex	Admit Date	Chief Complaint	Bed	Symptom Onset	s/s	Collection Date	Result
11111	44	F	10/30/13	PNA	812	11/2/13	Fever, diarrhea	11/2/13	E. coli
11116	35	F	10/30/13	Chest pain	1014	11/2/13	Fever, nausea, diarrhea	11/2/13	E. coli
11113	38	M	10/26/13	Foot wound	245	11/3/13	Fever, bloody diarrhea	11/3/13	E. Coli
12375	26	F	10/22/13	Contractions	440	11/3/13	Fever, diarrhea	11/3/13	E. Coli
16879	18	M	10/31/13	Stiff neck, headache	760	11/3/13	Fever, nausea, vomiting, diarrhea	11/3/13	E. coli
18984	60	M	10/31/13	Bug bites, Right flank pain	670	11/5/13	Fever, diarrhea	11/5/13	E. coli
19495	32	F	11/4/13-ER only	Fever, diarrhea	ER	11/4/13	Fever, diarrhea	11/5/13	E. coli



## What you know

- Cases include 6 ABC Hospital inpatients from all service areas. The most recent admission date for these patients was October 31.
- The 7<sup>th</sup> specimen came from a PCA who works at ABC Hospital. She was seen in the ER for diarrheal illness.



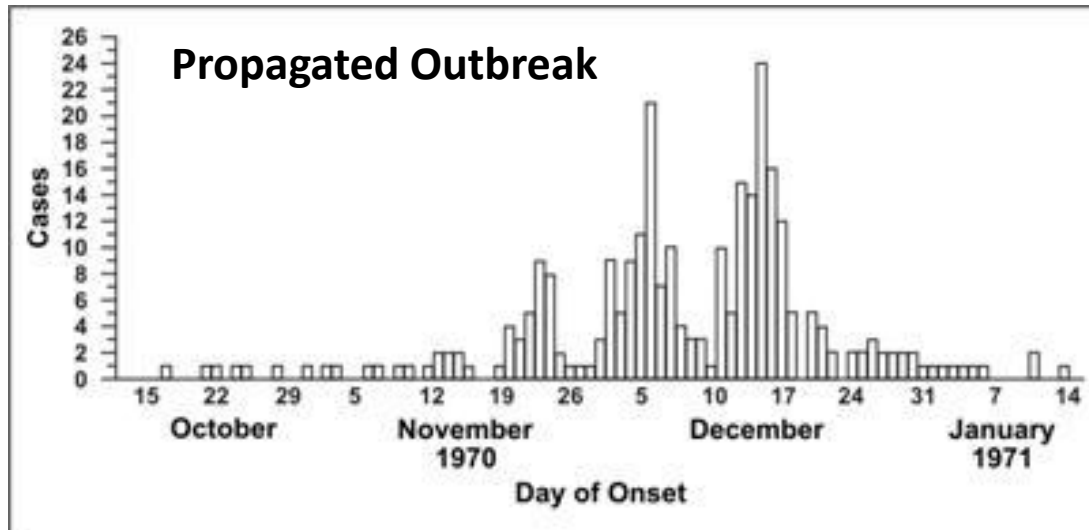
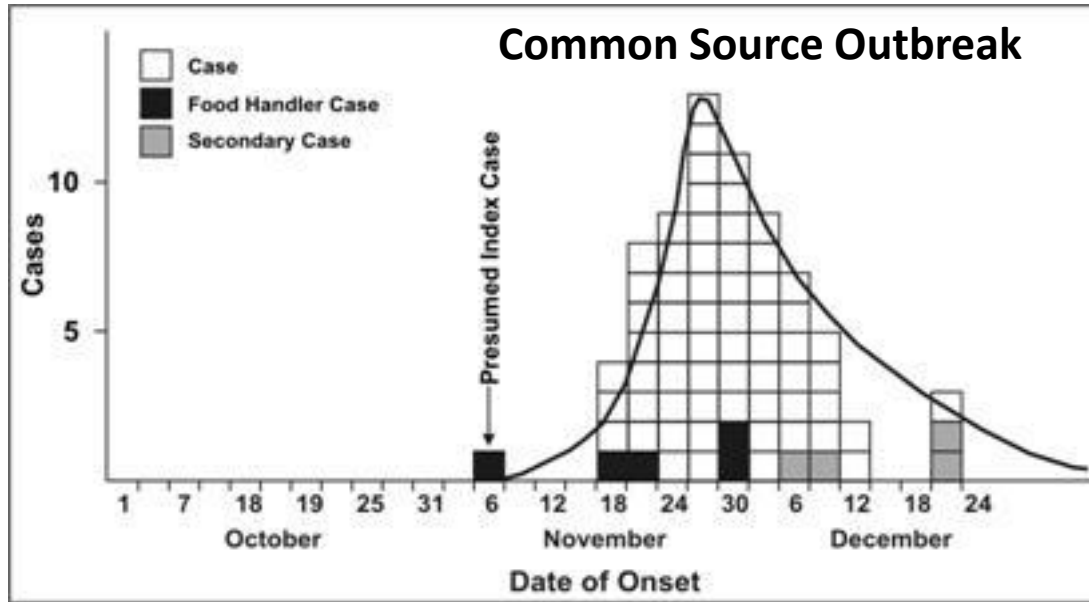
## What do you do next?

- In looking briefly at their charts and the line list, these patients:
  - Are not in the same unit, floor, or service; not in ICU
  - Do not have the same medical condition
  - Have not been cared for by the same employees; the PCA did not have contact with any of the other cases.
  - Had stool culture done due to onset of fever and diarrhea, after admission (except for the PCA who had symptoms in ER)
  - Are not on a special diet
  - Do not have the same types of devices (i.e., central lines, foleys)



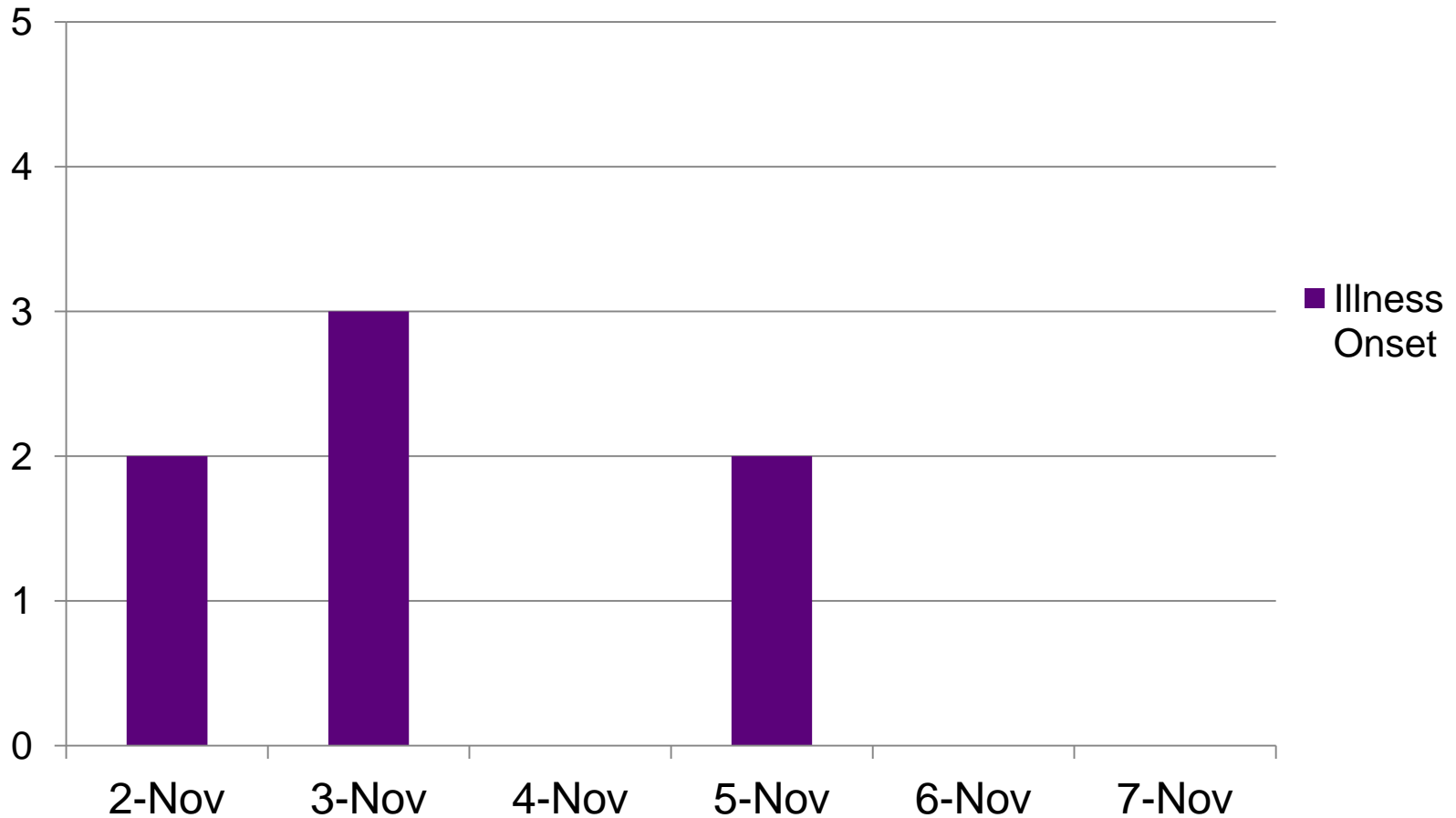
- **Common Source:**
  - A group of persons are all exposed to an infectious agent or a toxin from the same source.
- **Propagated:**
  - Transmitted from person-to-person
  - Cases occur over more than one incubation period

# Types of Outbreak





# Illness Onset Dates for ABC Hospital Patients with E. coli, November 2013



- Generate hypothesis for potential causative exposure that may be responsible for illnesses.
- Become familiar with the microbiology, natural history and ecological niche of the organism may also help guide the investigation.
- Establish person, place, time into the hypothesis

## Common Pathogens Associated with Foodborne Illnesses

- *Salmonella*
- *Shigella*
- Enterohemorrhagic and shiga toxin-producing *Escherichia coli*
- Hepatitis A
- Norovirus
- *Campylobacter*
- *Staphylococcus aureus*
- Botulism
- *Listeria*
- *Vibrio*



- It seems that these patients have these things in common: ABC Hospital, fever, and diarrhea.
- Hypothesis: These patients ate something at ABC hospital within the 10 days prior to their illness, which made them sick.
- 5 Day food history obtained from the cases
- All of them had eaten food from the cafeteria on October 31.



- Identify who needs to know of this investigation and notify appropriately
- Develop easy to read summaries, graphs and interpretations
- Hold meeting/conference call and establish how updates will be communicated and how often

- IP re-interviewed the patients with a food item specific questionnaire from the October 31 menu
- The attack rate was calculated for each food item served on October 31 for breakfast, lunch, and dinner.

## Attack Rates

- The highest attack rates were identified in three lunch items in the table below

Food Item	Ate	Did Not Eat	Attack Rate (%)
Fruit salad (cantaloupe and honeydew)	6	1	86%
Tortilla	5	2	71%
Chicken Salad	5	2	71%

- Due to lack of resources (IP staff) cannot do case-control study
- Find the source of contamination
  - Common source epidemic: can be stopped by interrupting the use/distribution; education
  - Propagated epidemic: continuous education will be needed; work restriction if symptomatic
- Control the outbreak through stopping the transmission

## Prepare for Rounding in the Kitchen



- Rounding in the kitchen includes more than just environmental rounding
- Key issues are: preventing cross contamination and ensuring food is kept at proper temperatures
- Handouts
  - DSHS Inspection Report
  - Sample IP Rounding Form

## What to Do to Prepare

- Develop a rounding form specific to the kitchen.
- Plan to observe receiving of food, food storage, food preparation, and delivery
- Carry a flashlight
- Identify who the Certified Food Managers are
- Be aware of potential cross contamination issues, time and temperature abuse, dress code, and illness restrictions

- Need to ensure the TX Food Code and FDA Food Code are followed
- Identify the Certified Food Manager(s)
  - Should have all the tools you need including
    - Thermometer
    - Knowledge of food code
    - Knowledge of processes
    - Knowledge of where things are located





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## Health and Hygiene of Employee

- Screen employees for health issues prior to starting their shift and exclude as necessary
  - Fever
  - Diarrhea
  - Skin
  - Unless wearing gloves, no fingernail polish or artificial nails
  - No jewelry on arms and hands except a plain band





## Potentially Hazardous Foods

- One of the biggest concerns in the kitchen is cross contamination
- A food that requires time and temperature control for safety to limit pathogen growth or toxin production.
  - An animal food (a food of animal origin), including fresh shell eggs, that is raw or heat-treated;
  - a food of plant origin that is heat-treated or consists of raw seed sprouts;
  - cut melons;
  - and garlic-in-oil mixtures that are not modified in a way that results in mixtures that do not support growth of pathogens or production of toxin

## Receiving Area for Food

- Receiving area should be kept clean
- Carts for transporting food items should be kept clean
- Pest prevention plan should be in place to keep pests from entering the facility through the receiving area



- When food is received, they must be at certain temperatures in order for the hospital to accept it for consumption. Temperatures depend on the type of food it is.
- Frozen foods should arrive frozen solid. No evidence of thawing and then refreezing.
- Foods should not be damaged or show any sign of pests or pest damage
- Use by or expiration dates should be on every item



- The hallways should not be obstructed due to storage of food items
- Once inspected and logged, food should be immediately stored at the appropriate temperature (cold or frozen)

- There are multiple times food should be labeled:
  - Upon receiving food
  - After opening a food package
  - After food is prepared
  - After food is cooked
- Labeling method and wording should be consistent throughout kitchen.



## Dry Storage

- Dry Storage rooms should be kept clean to prevent infestation by pests
- Items should be stored 6 inches from floor and walls and 18 inches from the ceiling
- Food from dented cans should not be used for consumption



# Time and Temperatures

## RECOMMENDED Safe Food Temperatures

Using a food thermometer is the **ONLY** reliable way to ensure food safety.

**165° F ... Poultry, ground poultry**  
Stuffing with poultry, meat & fish  
Microwave cooking & reheating  
Reheating leftovers

**155° F ... Ground meat & fish**  
Injected meat (i.e. tenderized)

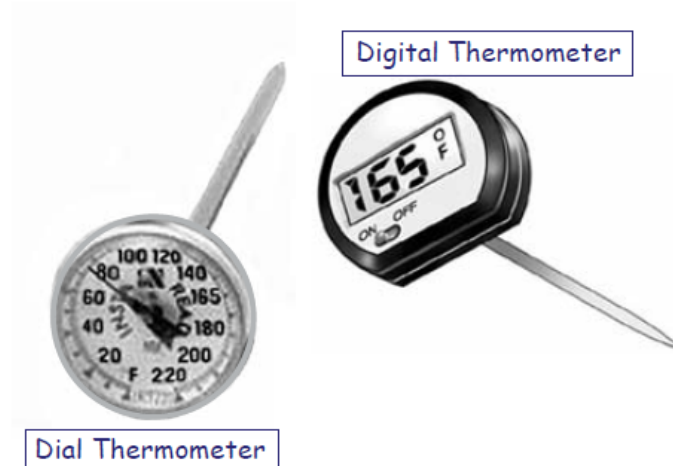
**145° F ... Meat, fish & raw shell eggs**

**135° F ... Hot holding of foods**

**41° F ... Cold holding of foods**

Meat = beef, pork & lamb

Poultry = chicken, turkey, duck & goose



These are the **minimum** safe food temperatures required by the Texas Food Establishment Rules.

[www.dshs.state.tx.us/foode establishments](http://www.dshs.state.tx.us/foode establishments)





## Thermometers



Thermometers should be cleaned,  
sanitized, and calibrated

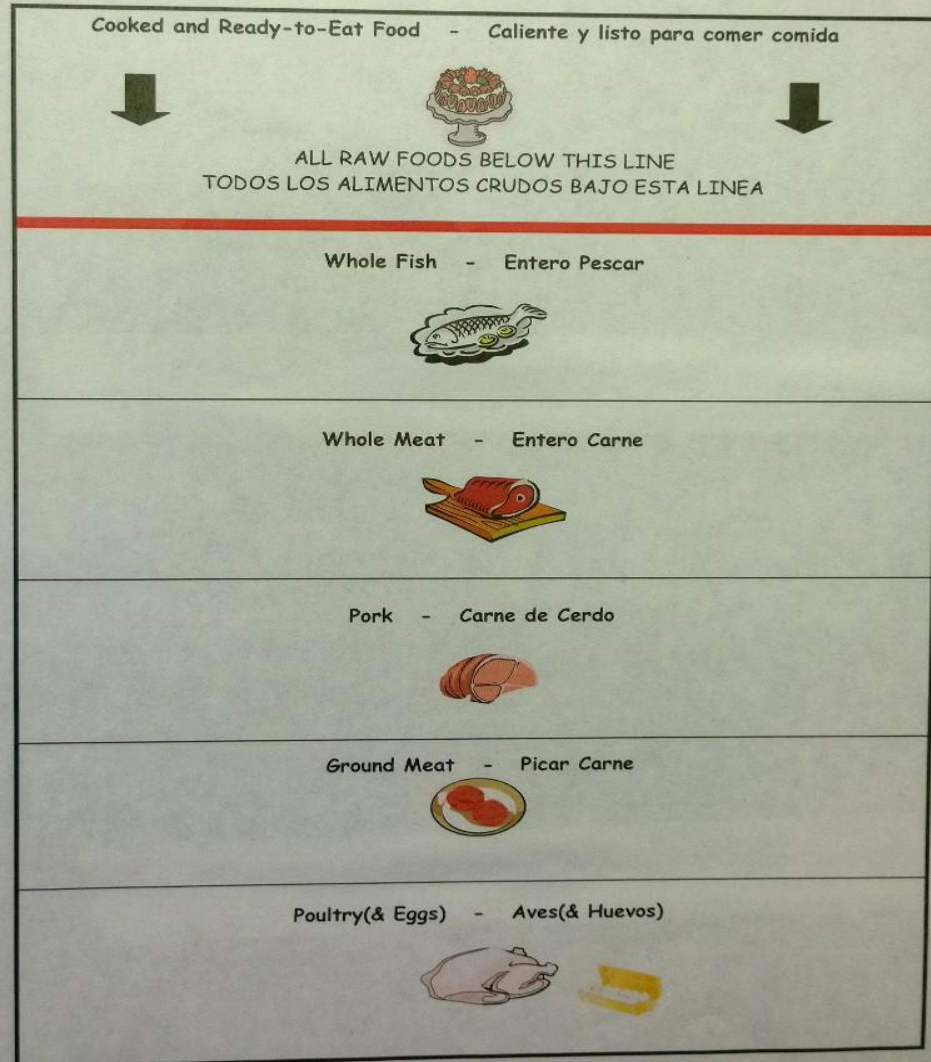


- Items needing refrigeration should be stored at 41°F or below.
- Frozen items should be kept at 0°F or below
- Food should be covered to prevent contamination
- Must comply with Food Storage Hierarchy to prevent cross contamination
- Coolers should be kept clean
  - no food or liquid stains on the floor
  - no mold
  - no pests

# Proper Refrigerator Storage

Apropiado frigorifico almacenamiento

Top-to-bottom storage of different foods in the same refrigerator  
Almacenaje de arriba hacia abajo de diferentes alimentos en el mismo refrigerador





## Hot Holding Food

- Food that needs to be kept hot until served should be stored at a minimum of 135°F
- Keep food covered to help retain heat and eliminate potential contaminants from falling into the food
- Internal temperature of food should be measured every two hours
- Discard any hot food after four hours if 135°F has not been maintained



- Proper cooling of hot foods is essential to preventing bacterial growth
- The temperature danger zone is between 41°F and 135°F; food should never be stored in these temperatures
- If food is cooked and not immediately served, it should be cooled down to 70°F within 2 hours of cook time. Hot food must then be cooled from 70 °F–41 °F in an additional 4 hours.

## COOKING & COOLING LOG

DATE: \_\_\_\_\_

INSTRUCTIONS →	Products' internal temperature must reach a minimum of 170°F	Initial cooling starts when product reaches 140°F	Internal temperature must reach 70°F within 2 hours of initial temperature	Internal temperature must be below 41°F within 4 hours from reaching 70°F	For a total of 6 hours of cooling				
PRODUCT NAME <small>The time should be the exact time when the temperature is taken</small>	FINAL COOKING		INITIAL TEMPERATURE		AFTER FIRST 2 HOURS		AFTER 4 MORE HOURS		INITIALS
	TIME	TEMP	TIME	TEMP	TIME	TEMP	TIME	TEMP	

<b>COOKING TEMPERATURES:</b> Products internal temperature should reach 170°F	<b>CORRECTIVE ACTIONS:</b> Continue to cook to required HACCP temperature for specific product.
<b>COOLING REQUIREMENT:</b> Cool foods (sauces) from 140°F to 70°F in 2 hours; and from 70°F to below 41°F within 4 hours for a total of 6 hours. If product is put directly into hot holding after cooking, no cooling requirement exists and that section may be shaded on this form.	<b>REHEATING AND CORRECTIVE ACTIONS:</b> Reheat to proper internal temperature within 2 hours and serve or reheat to 170°F and repeat chill process (1 time only) or discard product.

**CORRECTIVE ACTIONS, IF TAKEN:** \_\_\_\_\_

**SIGNATURE OF SUPERVISING MANAGER:** \_\_\_\_\_

MAINTAIN RECORDS FOR A MINIMUM OF 90 DAYS



- Prevent cross contamination
- Preparation utensils, equipment, and surfaces should be cleaned and sanitized between preparation of each food item
- Color code cutting boards (green-raw produce, red-raw meat, white-ready to eat)
- Proper hand hygiene and glove usage



- Conducting Hand Hygiene observations in the kitchen is different than observations in patient care areas
- Food employees shall keep their hands and exposed portions of their arms clean
- Hands should be washed with soap and water for at least 20 seconds





- Immediately before engaging in food preparation including working with exposed food, clean equipment and utensils, and unwrapped single-service and single-use articles
- After touching bare human body parts other than clean hands and clean, exposed portions of arms



- After using restroom
- After caring for or handling service animals or aquatic animals
- After coughing, sneezing, using a handkerchief or disposable tissue, using tobacco, eating, or drinking

- After handling soiled equipment or utensils
- During food preparation, as often as necessary to remove soil and contamination and to prevent cross contamination when changing tasks



## Hand Hygiene Moments

- When switching between working with raw food and working with ready-to-eat food
- Before donning gloves for working with food
- After engaging in other activities that contaminate the hands

- Except when washing fruits and vegetables, food employees
  - may not contact exposed, ready-to-eat food with their bare hands and
  - shall use suitable utensils such as deli tissue, spatulas, tongs, single-use gloves, or dispensing equipment
- Due to the susceptible populations in healthcare facilities, bare hand contact with ready-to-eat foods is prohibited



- Separate raw animal foods during storage, preparation, holding, and display from:
  - raw ready-to-eat food
  - cooked ready-to-eat food;
  - except when combined as ingredients, separating types of raw animal foods from each other during storage, preparation, holding, and display



## Prevent Cross Contamination

- Use separate equipment for each type of food
- Arrange each type of food in equipment so that cross contamination of one type with another is prevented
- Prepare each type of food at different times or in separate areas;
- Clean and sanitize equipment and utensils



- **CLEAN:** A process that removes soil and prevents accumulation of food.
- **SANITIZE:** The final step needed to remove bacteria from food contact surfaces that have just been **CLEANED**. A common **SANITIZING** solution is made up of one teaspoon of bleach to one gallon of water and is used to **SANITIZE** surfaces and equipment. Chemicals are used reduce disease-causing germs to safe levels.



- **CLEAN and SANITIZE** food-contact surfaces:
  - Between cutting different types of raw meat
  - Between working with raw meats and ready-to-eat foods
  - Anytime contamination has occurred
- Store wet wiping cloths in a chemical **SANITIZING** solution between uses.



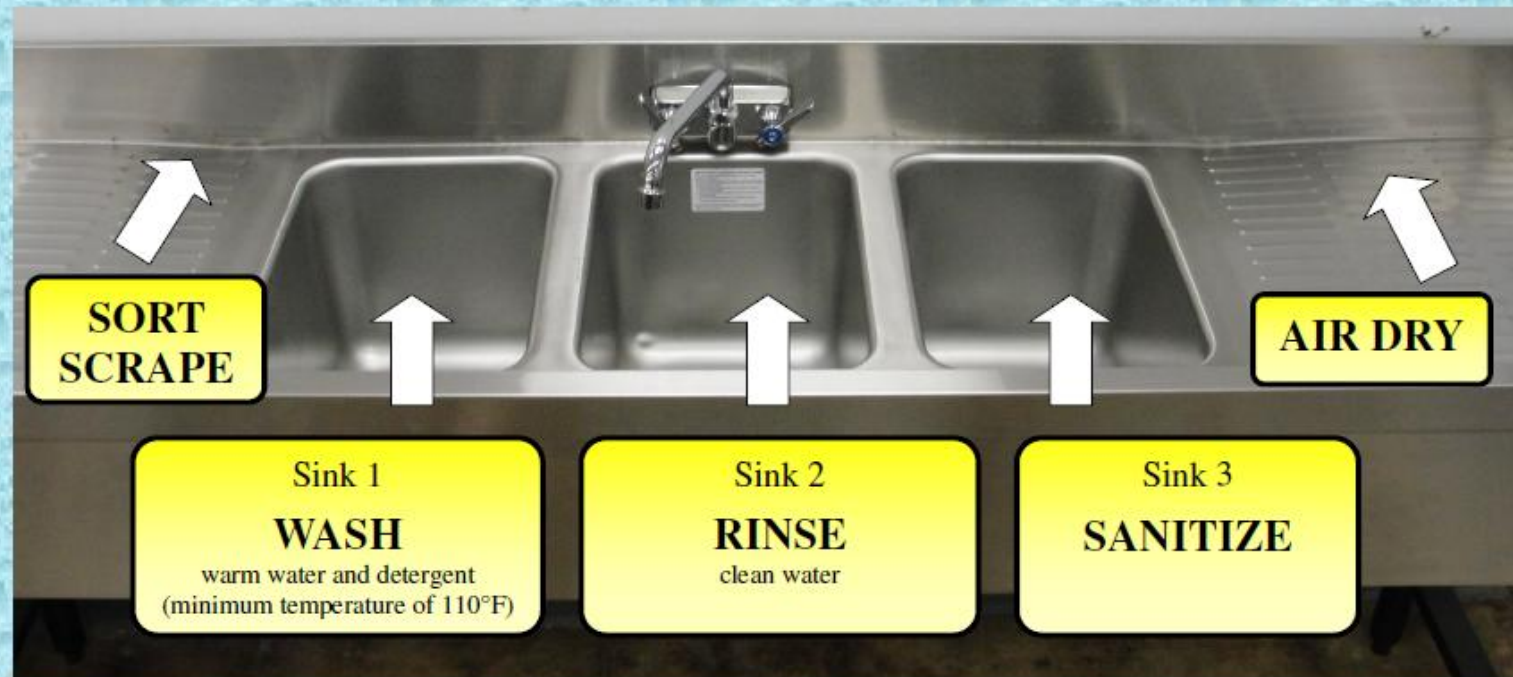
- Keep chemical **SANITIZING** solutions at the appropriate concentration and free from food debris and visible soil.
- Use test strips for checking chemical **SANITIZING** solutions.
- Sanitizing solutions buckets should not be stored next to food-contact surfaces



## Disinfectants

- Only use disinfectants designated for food contact surfaces
- Chlorine, Iodine, and Quaternary-based disinfectants

# Three-Compartment Sink



## HOW TO SANITIZE

### Chlorine Solution

- minimum temperature 75°F - 100°F
- 7-10 seconds in 25 - 100 ppm

### Quaternary Ammonium Solution

- minimum temperature 75°F
- 30 seconds in 200 - 400 ppm

### Iodine Solution

- minimum temperature 75°F
- 30 seconds in 12.5 - 25 ppm

*All chemical solutions should be tested for effectiveness using a test kit strip.  
Use according to manufacturers directions and the Texas Food Establishment Rules*



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## Food Delivery

- Food should be transported to units and consumed by patients within 2 hours of leaving temperature controlled environment.  
(recommend heated or cooled transportation units)
- Hand hygiene should be completed at entry and exit of room.





Presences of pests in food establishments is concerning due to:

- May carry food-borne pathogens
- Potential indicator of unsanitary conditions
- May contaminate food or cross contaminate
- May cause damage to food or facility
- Ascetically unpleasing

## Diseases caused by Pests

- *Salmonella*
- *Cholera*
- *E. coli*
- *Vibrio*
- *Shigella*
- *Pseudomonas*
- *Staphylococcus*
- *Streptococcus*
- *Toxoplasmosis*
- *Clostridium*
- *Leptospirosis*
- *Hantavirus*
- Rabies
- SARS
- *Histoplasmosis*
- Encephalitis
- Meningitis
- *West Nile Virus*



## Classification of Pests

### Class 1- Vectors (High Priority)

- Potential to transmit disease
- House fly, German cockroach, Pharaoh ant, House mouse



Pharaoh Ant



German Cockroach



House Mouse



### Class 2- Indicators of Unsanitary Conditions (Medium Priority)

- Poor sanitation,
- Potential to cross contaminate
- Silverfish, cluster fly, pigeon, granary weevil, cheese skipper, booklouse, confused flour beetle, Indian meal moth



Confused Flour Beetle

Granary Weevil



Cluster Fly

## Classification of Pests (cont.)

### Class 3- Incidental Pests (Low Priority)

- Nuisance (no health hazard, not indicative of poor sanitation)
- Lady bugs, grasshoppers, aphids



Russian  
Wheat Aphid

Lady Bug



Grasshopper



- Presence of fecal pellets/droppings, fecal smear, or urine stains.
- Musty or stale odors
- Presence of dead insects or body fragments
- Presence of eggs/capsules.
- Insect or rodent activity at night (or day-typical of infestation)
- Fly specs on walls or ceilings
- Presence of maggots

## Evidence of Pests (cont.)

- Trails of ants along baseboards, electrical wires, pipes or other pathways
- Presence of transported dirty, sand, or frass (gnawed materials by ants)
- Presence of insects in food supply
- Evidence of product damage and gnaw marks
- Insects and larvae in dark cracks in flooring, in walls, and in seams of bags
- Rub marks along walls near floor level (mice, rats)

- Prevent Entry
- Remove nesting/breeding sites
- Eliminate potential sources of food and water
- Monitor regularly



## Control Measures in Action

- Keep garbage containers/dumpsters clean (both inside and outside the building)
- Cut weeds/grass and eliminate debris around building that offer breeding places
- Clean drains and install drainage for wet areas
- Inspect roofs and walls for nesting sites
- Seal holes in walls/ floors/ windows
- Use self closing doors
- Install door sweeps
- Keep doors closed
- Install air curtains or plastic strip curtains
- Positive pressure at entry points
- Install screens and maintain in good repair
- Remove trash in a timely manner

## Control Measures in Action (cont.)

- Remove clutter inside facility
- Keep floors clean
- Clean spills immediately
- Keep food covered
- Eliminate sources of moisture
- Inspect shipments of goods for pests
- Store ingredients and products away from windows
- Rotate stock frequently
- Discard infested products immediately
- Store empty used food containers away from other products and remove ASAP



- Raw ground beef used for November 1 Meatloaf was stored above the fruit salad in the refrigerator, which led to contamination of this ready-to-eat food item
- Outbreak Control Measures: Everything in the cooler was sanitized and employee education provided on proper storage of food items, proper usage of gloves, and hand hygiene.



## Last Step of Outbreak Investigation

- Last step is to declare the outbreak is over

- Steps for an Outbreak investigation
- Infection Prevention rounding in the kitchen
- Resources for rounding in the kitchen
- Risks in the kitchen
- Hand hygiene in the kitchen
- Cleaning and Sanitizing
- Pests and Control Measures

## What's Wrong with this Picture?





- Texas Administrative Food Code Chapter 25, Part 1, Chapter 229, Subchapter K, 2006
- Texas Department of State Health Services Food Establishment Group
- Food and Drug Administration, Pest Control in Food Establishments
- Food and Drug Administration Food Code, 2009
- ServSafe National Restaurant Association