

# **Food Safety for Volunteers & Students**



**Food Safety is Everyone's Responsibility!**

**July 2022**

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This class was developed by Child Nutrition & Wellness, Kansas State Department of Education. Class content and activities were adapted from the following sources:

- *Kansas Food Safety in Schools*, Kansas State Department of Education, Revised for July 2022
  - *Food Safety Basics*, Kansas State Department of Education, Revised for July 2022
  - *Focus on Food Safety*, Kansas Department of Agriculture, Division of Food Safety and Lodging, Revised March 28, 2012, [www.ksda.gov](http://www.ksda.gov)
  - *Focus on Food Safety*, Kansas Department of Agriculture, Food Safety Fact Sheets, Handout #4-No Bare-Hand Contact, Handout #6-Cooling, Handout #8-Date Marking, Handout #11-Employee Handwashing Sign, Handout #36-Manual Cleaning and Sanitizing, Handout #41-Food Safety for Group Functions, Handout #47-Three Compartment Sinks, Handout #49-Two-Stage Cooling, December 2008
  - *5 Myths of Handwashing*, Iowa State University, University Extension, Iowa Food Safety Task Force, N3503a March 2007
  - Illustrations of Microbial Growth, Project Funded by CSREES/USDA Project 2005-5111003275
  - *Be Food Safety Smart*, Curriculum Questions, Project Funded by CSREES/USDA Project 2005-5111003275
  - United States Department of Agriculture, Food Safety and Inspection Services, *Cooking for Groups, A Volunteers Guide to Food Safety*, March 2001, revision September 2011
  - Crossword Puzzle Maker, [www.CustomPuzzles.com](http://www.CustomPuzzles.com)
  - [www.JustWordSearch.com](http://www.JustWordSearch.com)
  - The University of Rhode Island, Rhode Island Food Safety Education, Employee Education, *Volunteer Food Service Worker Training 2012*
  - *ServeSafe Starter Employee Guide*, Controlling Time and Temperature
  - Food Safety Kit Products and Resources, Food Safety Education for Residential Child Care Institutions, The University of Rhode Island, Rhode Island Cooperative Extension Funded by CSREES/USDA Project 2007-5110-03816, August 2009
  - Kansas Food Code 2005, Kansas Department of Agriculture, Division of Food Safety Retail Food Inspection, [www.ksda.gov](http://www.ksda.gov)
  - University of Connecticut • University of Massachusetts • University of Rhode Island, *Food Safety Education for High School and Transition Special Needs Students, Food Safety Smart, Curriculum*, March 2010, Funded by CSREES/USDA Project 2005-5111003275
  - Kansas State University, <http://www.ksre.ksu.edu/foodsafety/>
  - Guidelines for Managing Life Threatening Food Allergies in Schools, Spokane Public Schools, [www.spokaneschools.org/nutritionservices](http://www.spokaneschools.org/nutritionservices), manage\_allergies\_guidelines.doc Revised: 6/12/07
  - National Restaurant Association Education Foundation, *Cleaning and Sanitizing Practices That Will Prevent Cross-Contamination*, National Food Safety Month, September 2012
  - The Food Allergy & Anaphylaxis Network, [www.foodallergy.org](http://www.foodallergy.org); [faan@foodallergy.org](mailto:faan@foodallergy.org)
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# **Food Safety for Volunteers & Students**

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# Introduction

Offering quality foods that are safe to eat begins with knowledgeable food handlers. This workbook concentrates on areas critical to food safety including personal hygiene, preparing and serving foods, cleaning and sanitizing, and handling foods for people who have food allergies.

## **Child Nutrition Program customers want:**

- Food that looks and tastes good
- Food that is safe to eat
- A safe dining environment that is pleasant and welcoming

## **Child Nutrition Program employees, volunteers and student workers need:**

- Information and tools to do their job effectively and safely
- A work environment that encourages and rewards correct food safety behaviors

## **Child Nutrition Program managers and directors must:**

- Make food safety training available
- Ensure food handlers are well trained and knowledgeable
- Support an environment that models handling food safely at all times

## **Modules**

This training tool consists of five modules that can be used as a self-training booklet or as a workbook for a supervisor and food handler to progress through together. Information in each module is provided in a specific area of food safety followed by activities to reinforce learning. This is an ideal tool to use as a food safety training refresher, as an introduction to food safety for a new employee who has not taken a required 3-hour food safety class yet, or as a guide for volunteer staff and student workers.

### **Module 1: Food Safety is in YOUR Hands**

- Hand Washing
- Personal Hygiene
- Glove Use

### **Module 2: Foodborne Illness**

- Foodborne Illnesses
- Microorganisms
- Time/Temperature Control for Safety foods

### **Module 3: Handle with Care**

- Thawing
- Cooking
- Cooling
- Date Marking

### **Module 4: Cleaning and Sanitizing**

### **Module 5: Allergen Awareness**

## **Glossary**

# Module 1: Food Safety is in YOUR Hands

List four sources of possible contamination shown in the picture.

- 1) \_\_\_\_\_
- 2) \_\_\_\_\_
- 3) \_\_\_\_\_
- 4) \_\_\_\_\_



Food safety is the daily responsibility of those who prepare and serve food. Disease-causing microorganisms on the body can come in contact with food or food-contact surfaces and contaminate foods. Activities such as smoking, eating, drinking, handling raw foods, dispensing garbage, using the restroom, touching the face, and coming to work when sick are all sources of possible contamination. By following good personal health and hygiene practices, the risk of a foodborne illness can be reduced.

## Personal Health Practices

The personal health of workers is critical to protecting the health and safety of others, since germs can be easily transferred to others.



- Do not work around food or clean food-contact surfaces when sick.
- Report symptoms of diarrhea, vomiting, fever, infection, and jaundice to a supervisor.
- Do not use a common towel, wiping cloth, or apron to wipe hands and face.
- Do not eat, drink or use tobacco in any form in food production and service areas.
- Do not put a utensil used for tasting foods back into the food to be served.

## Personal Hygiene Practices

Promote a safe food service environment by following these personal hygiene practices:

- Brush teeth and bathe daily.
- Wear clean clothes and be aware of activities that could contaminate clothes.
- If available, wear a clean apron to add another barrier between clothes and foods.
- Remove an apron when leaving food preparation areas (breaks and restroom use).
- Limit jewelry to a plain band ring and simple earrings when handling foods and clean equipment.
- Remove bracelets, watches, and other wrist devices during food preparation activities.
- Keep nails short, smooth, clean and unpolished, since long, rough fingernails and artificial nails provide an ideal environment for harmful bacteria to thrive.



## Hair Restraints

Hair can be a source of contamination. Good personal hygiene involves wearing hair restraints, designed and worn to effectively keep hair from contacting exposed foods and clean equipment. The wearing of hair restraints is a Kansas Food Code requirement and applies to anyone who handles food or clean equipment.

- Restraints should have a friendly look and be dedicated to the food service job.
- Restraints can also be a source of contamination and must be kept clean.
- Beard restraints can be used for facial hair.
- Options for the head include ball caps, skull caps, hairnets, do-rag, and mesh nets.
- Local policies on hair restraints may be stricter and some options may not be allowed.



## Handwashing

Handwashing is a multi-step activity that needs to be done effectively and often.

- Wash hands after every incident of possible contamination.
- Use a designated hand sink.
- Apply warm water (about 100°F) and soap.
- Scrub hands for 20 seconds, including backs of hands, wrists, fingers, and under fingernails.
- Rinse to remove the soap and germs.
- Air dry or use a disposable paper towel.



Bacterial growth on unwashed hands



Handwashing Map shows red and purple areas frequently missed when handwashing.

© HAHS IPCU 2003

Hand sanitizers are not an acceptable substitute for handwashing but can be used **after** handwashing if desired.

## No Bare-Hand Contact Rule

Personal health and personal hygiene include protecting ready-to-eat foods with enforcement of the “No Bare-Hand Contact Rule”. The Kansas Food Code prohibits bare-hand contact with ready-to-eat foods. The “No Bare-Hand Contact Rule” applies another layer of protection for foods and further reduces food safety risks. Utensils, deli tissue, or single-use food gloves over washed hands can be used to dispense ready-to-eat foods.

## Glove Use

- Wear single-use food gloves as an option for handling ready-to-eat foods.
- Wear food gloves to cover an injury on the hand for handling all foods.
- Wash hands before putting on a pair of single-use food gloves.
- Do not blow in the single-use food gloves to create an opening.
- Use single-use food gloves for one task and then discard.





## Module 1: Risky Business Activity

Check the activities that would be considered “risky” for spreading harmful microorganisms.

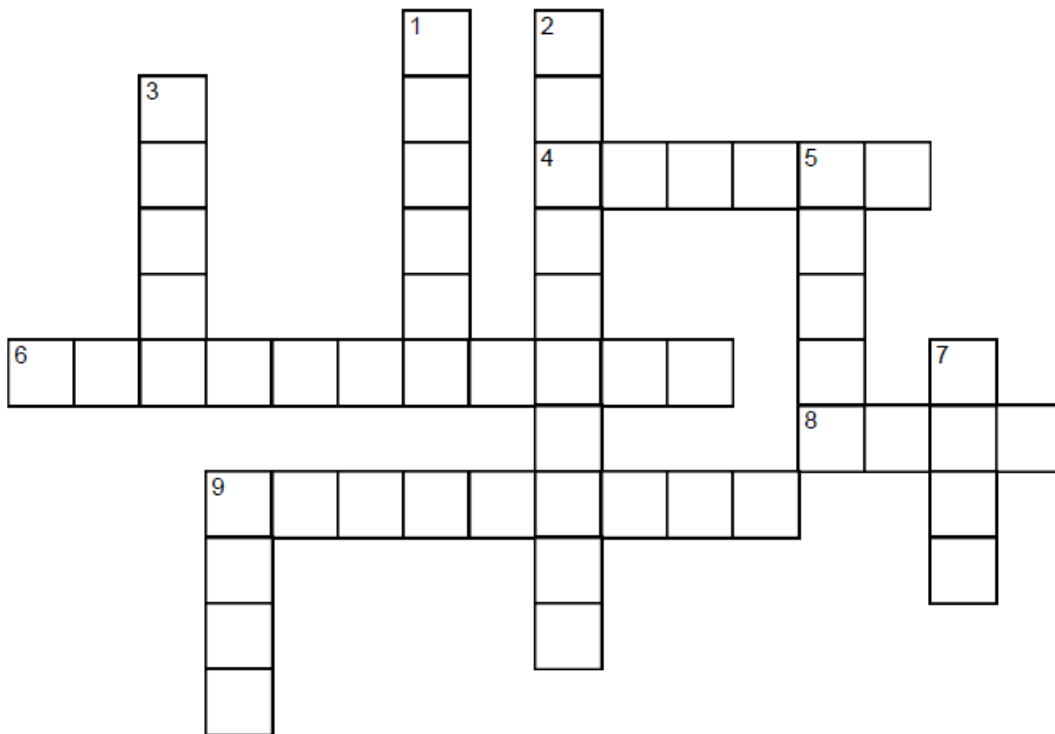
- 1. Henrietta cuts her finger on the lid of a can. She covers the cut with a bandage and continues preparing items for the fruit and vegetable bar.
- 2. Kaye is wearing a medical bracelet while preparing macaroni salad for lunch.
- 3. Tom has grown a beard but does not consider it long enough to wear a beard restraint.
- 4. Barb feels sick a few hours after getting to work. After an episode of vomiting she tells her supervisor that she needs to go home.
- 5. Joe does not have time to change from his farm business ball cap to his food service ball cap and proceeds to serve food on the line.
- 6. Nancy washes her hands between handling the dirty dishes and unloading the clean dishes from the dishwasher.
- 7. Sue hides her cell phone in her utensil drawer so she can easily get it when she receives a call or text.
- 8. Mark has been in food production since 6:00 am and has several food stains on his apron. At 11:00 am he decides to change into a clean apron for serving food on the line.
- 9. Kathy collects the ingredients she needs for her recipe in advance to reduce the risk of contaminating her hands after starting to prepare the recipe.
- 10. Peggy takes her apron off before using the restroom.

**Risky Business Activity Answers**  
Activities 1, 2, 3, 5 & 7 are risky.

## Handwashing Myths & Misunderstandings

Handwashing Myth or Misunderstanding	Truth
Very hot water is necessary.	Required minimal water temperature is 100°F. Using water that is less than 100°F does not effectively remove soil and germs.
Antimicrobial soap is necessary.	Studies have shown that ordinary soaps are effective at removing germs from the hands when used with 100°F water.
Cloth towels work fine to dry hands.	Damp cloth towels harbor harmful bacteria and can contaminate hands. Disposable paper towels or air dryers are acceptable ways to dry washed hands.
Hand sanitizers are just as good as handwashing.	Hand sanitizers do not remove soil from hands and are ineffective against some viruses. Wash hands with soap and 100°F water.
It is only necessary to wash hands after using the bathroom.	<p>Wash hands after contact with any source of possible contamination.</p> <ul style="list-style-type: none"> <li>• Coughing, sneezing or blowing nose</li> <li>• Touching face or hair</li> <li>• Contact with body or bodily fluids</li> <li>• Smoking, eating or drinking</li> <li>• Handling raw foods</li> <li>• Taking out the trash</li> <li>• Touching unclean equipment</li> <li>• Handling money</li> <li>• Handling chemicals</li> <li>• Handling animals or animal wastes</li> </ul>

# Module 1: Food Safety is in YOUR Hands Crossword

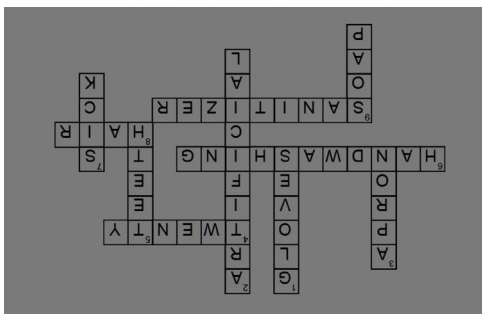


## ACROSS:

- 4 – Number of seconds needed to effectively wash hands
- 6 – Hygiene activity required before putting on single-use food gloves
- 8 – Restraints required to protect food and food-contact surfaces from contamination
- 9 – This product can be used after proper handwashing but cannot replace handwashing

## DOWN:

- 1 – Ready-to-eat foods can be handled with these single-use items over washed hands
- 2 – This type of nail can harbor harmful bacteria and contaminate foods
- 3 – This additional barrier helps to protect foods and food-contact surfaces from contaminants that may be on clothes.
- 5 – Brushing of these will help limit growth of harmful microorganisms
- 7 – These food handlers should not come in contact with foods and clean food-contact surfaces.



## Module 2: Foodborne Illness


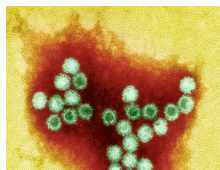

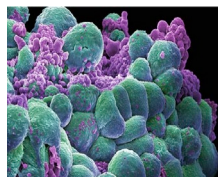


The foods served to children can cause foodborne illness if they are not handled safely. Looking, tasting, and smelling foods are not effective ways of determining if they are safe to eat. Some contaminated foods do not have a foul odor or taste and contaminants may not be visible without a microscope.

Young customers are much more vulnerable to contaminants in foods since they have immune systems that are just developing. The elderly, pregnant women and those with compromised immune systems are also much more likely to get sick from contaminated food. Food can be contaminated by the biological contaminants of bacteria, viruses, parasites, fungi, molds, and yeasts. Chemicals or physical contaminants, such as metal shavings or glass, can also get into food and cause foodborne illnesses.

Bacteria and other microorganisms are naturally present in the environment and in the body. Not all bacteria are harmful to humans. For example, beneficial bacteria are used to make yogurt and cheese. However, harmful bacteria can contaminate food and cause symptoms, such as vomiting, abdominal cramps, and diarrhea. Food that is mishandled can also cause more serious consequences in the body, such as kidney failure and neuromuscular problems.

### Microorganisms

Bacterium	Virus	Parasite	Fungus
			

Microorganisms are small living things. Harmful microorganisms are called pathogens.

Pathogens, such as E. coli, Listeria, or Salmonella may be present on food items when they are purchased. It is, therefore, crucial to keep these harmful microorganisms from growing to levels that could cause sickness. Proper handling of foods and care of food-contact surfaces can control the growth of these harmful microorganisms. Keep foods safe to eat by storing, cooking, holding, serving and cooling them correctly.

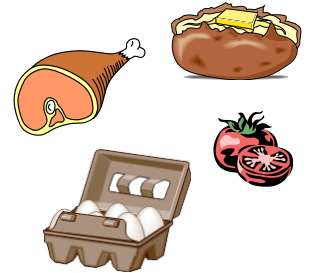
## Conditions for Bacterial Growth

Some bacteria are harmful and can cause contamination of foods. Bacterial reproduction can be controlled if foods are handled correctly. Harmful bacteria can be transferred to foods from hands, equipment, other foods, or pests (animals and insects).

Bacteria need favorable conditions to grow to harmful levels.

### Bacteria like time and temperature control for safety foods (TCS) foods

- TCS foods provide an energy source for bacteria.
- TCS foods are high in protein, moist and have low acidity.
- TCS foods support the rapid growth of harmful bacteria.
- TCS foods require time and temperature controls for safety.



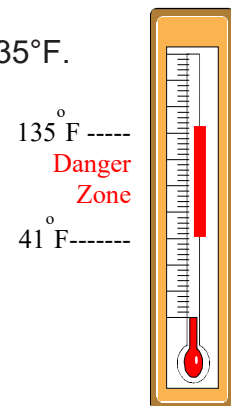
### Bacteria need time to grow and multiply

- Bacteria double every 20-30 minutes in favorable conditions.
- Bacteria dump toxins on foods as part of their life cycles.
- Minimize time in the temperature danger zone to 4 hours or less to limit bacterial reproduction and toxin formation.



### Bacteria prefer comfortable temperatures

- Keep TCS food out of the temperature danger zone of 41°F to 135°F.
- Refrigeration slows the growth of bacteria.
- Freezing stops the growth of bacteria.
- Heating to proper internal temperatures kills most bacteria, but may not destroy harmful bacterial toxins.
- Hold cold TCS foods at 41°F or below.
- Cook hot TCS foods to a proper internal temperature for that food and hold at 135°F or above.



### Bacteria need moisture

- Bacteria are life forms that require moisture to survive and reproduce.
- Dry foods do not support rapid growth of harmful microorganisms.

### Bacteria thrive within certain pH levels

- Acidity level (pH) affects bacterial growth.
- Harmful bacteria grow quickly in foods that are neutral or slightly acidic, specifically between a pH of 4.6 to 7.5.
- Bacteria do not grow well in foods that are high in sugar or salt or those that are highly acidic.

### Bacteria differ in their need for oxygen

Some bacteria need oxygen for growth, some require the absence of oxygen and some can grow with or without oxygen.

## Module 2: Quick Quiz

Quiz yourself to see how much information you remember!

1. True or False: You can tell if a food is safe to eat by smelling it and tasting it.
  - a. True
  - b. False
2. Harmful microorganisms (pathogens) can contaminate food from what source(s)?
  - a. hands
  - b. equipment
  - c. other foods
  - d. all of the above
3. What conditions are need for bacteria to grow quickly?
  - a. warm temperatures
  - b. time
  - c. moisture
  - d. all of the above
4. Harmful bacteria prefer a certain pH range. They grow quickly between
  - a. pH 4.6 and pH 7.5
  - b. pH 3.0 and pH 4.5
  - c. pH 8.6 and pH 10.0
  - d. none of the above
5. Examples of biological contaminants that can cause foodborne illness are,
  - a. parasites
  - b. bacteria
  - c. viruses
  - d. all of the above
6. Harmful microorganisms can contaminate food. What is a microorganism?  
Micro = \_\_\_\_\_ Organism = \_\_\_\_\_
7. What is the temperature danger zone for TCS foods (time/temperature control for safety)?  
Between \_\_\_\_\_ °F to \_\_\_\_\_ °F
8. Name four physical contaminants that can get into food and cause harm.

_____	_____
_____	_____

## Module 2: Quick Quiz Answer Key

- 1. b.** You cannot determine whether a food is unsafe by smelling it or tasting it. Some contaminated foods smell bad and some do not have a foul odor. The best way to keep food safe is to handle it safely at all times. If you are unsure about a food, then discard it.
- 2. d.** Harmful microorganisms can be easily transferred to foods by hands, equipment, and other foods. Wash hands, clean surfaces, and handle foods safely.
- 3. d.** Bacteria grow rapidly when they have food (nutrients), moisture, warm temperatures and time to grow.
- 4. a.** Harmful bacteria grow quickly between pH 4.6 and pH 7.5. Bacteria do not grow well in foods that are high in sugar or salt or those that are highly acidic.
- 5. d.** Food can be contaminated by the biological contaminants of bacteria, viruses, parasites, fungi and molds.
- 6.** Microorganisms are small living things.  
Micro = small    Organism = living thing or life form
- 7.** The temperature danger zone for TCS foods (time/temperature control for safety) is  
Between 41°F to 135°F
- 8.** Physical contaminants that can get into food and do harm include the following:  
Metal shavings, glass pieces, bandages, hair, fingernail polish, artificial fingernails, jewelry pieces, packaging, stones, bones, twigs, shells, feathers, paper clips, pins, etc.

## Module 3: Handle with Care

### Thawing

The following methods are recommended for thawing frozen time and temperature control for safety (TCS) foods safely:

- Under running water (70°F or below) for less than 2 hours
- In a refrigerator at 41°F or below
- Microwave, as part of the cooking process
- During a continuous cooking process

**Never thaw foods at room temperature!**




### Cooking



Did you know...hamburger can turn brown before it is cooked to its proper internal temperature of 155°F? It may appear to be cooked at 130°F. It is only safe to bite when the temperature is right!

Cooking food safely is a matter of degrees! Cooked TCS foods must reach minimum internal temperature as determined by the Kansas Food Code and Child Nutrition Program guidelines.

A food thermometer is the only reliable way to determine the internal temperature of prepared TCS foods, making it a valuable tool in the operation. Food thermometers must be used and cared for properly.

Thermometer Upkeep	Wash, rinse and sanitize a food thermometer after each use. Put the food thermometer in its protective case and store it to prevent it from rolling or dropping.	
Calibration	A food thermometer requires periodic adjustments to ensure it is providing accurate temperature readings. Calibrate in an ice bath by inserting the stem and adjusting the dial to 32°F.	
Taking Temperatures	To take the internal temperature of a TCS food, hold the food thermometer by the top dial portion, insert the stem into the thickest part of the food. Allow 15 seconds for the temperature to register. Use a thin-tipped probe food thermometer when taking the temperature of a very thin TCS food, such as pizza.	



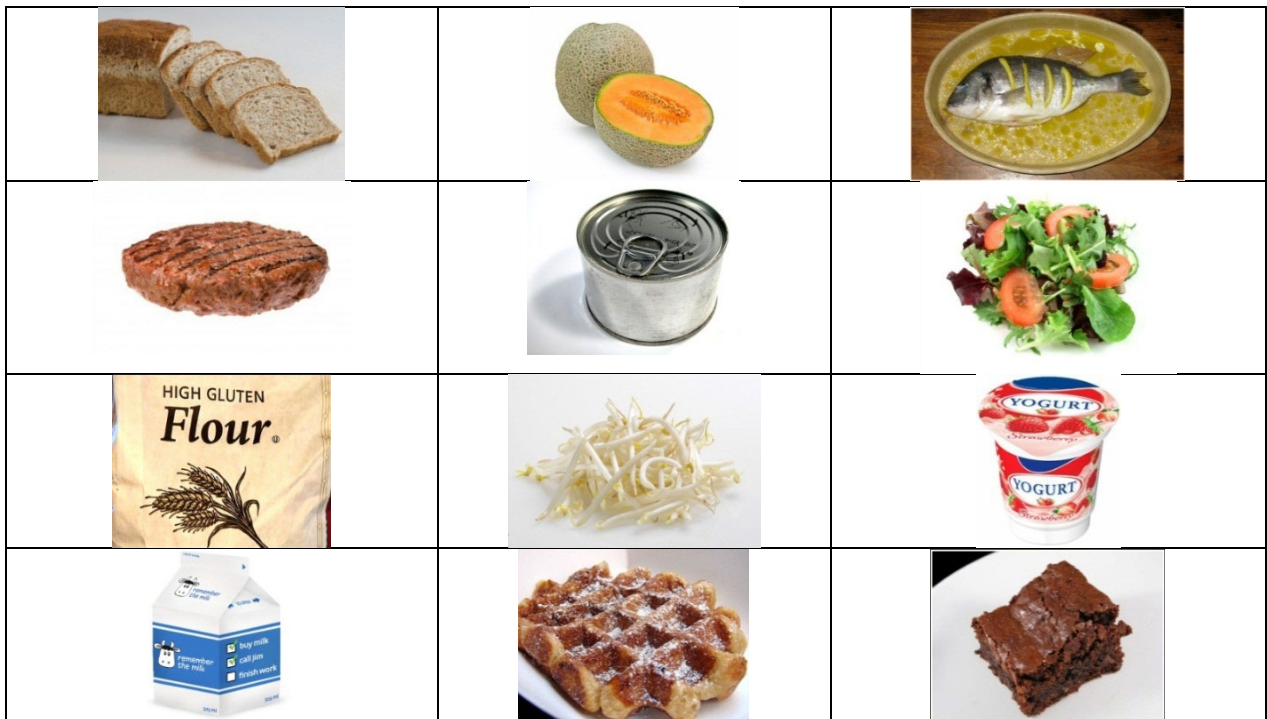
## Time & Temperature Control for Safety (TCS) Foods

Time and temperature control for safety foods support the conditions favorable to bacterial growth and require careful handling.

Common TCS foods are:

- milk and many other dairy products (soft cheeses and yogurt)
- eggs
- meats (beef, pork, lamb), poultry (chicken, turkey)
- fish and shellfish
- cooked plant foods (rice, beans, baked potatoes, vegetables)
- tofu and other soy proteins
- cut melons
- cut tomatoes and cut leafy greens
- sprouts and sprout seeds

Which of the following are time and temperature controls for safety (TCS) foods?



Food safety requirements for TCS foods are:

- Hold cold ready-to-eat TCS foods at 41°F or below.
- Cook hot TCS foods to a proper internal temperature for that food and hold at 135°F or above.
- Take and record temperatures of TCS foods using a cleaned and sanitized, properly calibrated food thermometer.
- Maintain proper time and temperature controls on TCS foods during transport to other sites.

## Cooling TCS Foods

Cool cooked TCS foods quickly to reduce the risk of bacterial growth. The Kansas Food Code requires that cooked TCS foods be cooled using two stages of cooling.

Two-Stage Cooling Method	<ul style="list-style-type: none"><li>• Reduce the cooked food's internal temperature from 135°F to 70°F within 2 hours.</li><li>• Reduce the cooked food's internal temperature from 70°F to 41°F within an additional 4 hours</li><li>• Total cooling time must not exceed 6 hours.</li><li>• Discard if proper cooling is not achieved at each stage.</li></ul>
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Apply one or more cooling strategies to cool TCS foods quickly.

- Place in shallow pans in the cooler and leave partially uncovered temporarily.
- Divide into smaller portions (e.g. 1-gallon increments) and put into the cooler.
- Use rapid cooling equipment, such as blast chillers.
- Place containers of food in an ice bath and stir food.
- Add ice in place of water as an ingredient in the recipe.

**Food should never be left out on the counter to cool under any circumstances or for any length of time!**



## Date Marking TCS Foods

Date marking time and temperature control for safety foods is another requirement identified in the Kansas Food Code. Since a time and temperature control for safety food can be held for up to 7 days in a refrigerator at 41°F or below, label with a 'use by' date that is seven days from the day the food is cooked and cooled, thawed, opened, cut, or altered. The day the food is prepared, or the day a commercially processed food, such as cottage cheese, is opened, counts as "day one". A 'use by' date is a food safety date and the food is unsafe to eat if it has passed that date in the refrigerator.

When a time and temperature control for safety food is frozen, bacterial growth suspends. Time stored in the freezer does not count toward the 7-day total. When a TCS food is removed from the freezer, mark it with a use-by date that is 7 days minus the length of time the food was refrigerated before it was frozen.

**USE BY**

## Minimum Internal Cooking Temperatures for TCS Foods

Cook TCS foods to the minimum internal temperature required for that type of food.

Leftovers, casseroles, stuffed meats, fish, and pastas, microwaved items	165°F
Poultry (breasts, legs, wings, ground)	165°F
Ground meats (beef, pork, veal, lamb, game animals)	155°F
Flaked or ground fish (sticks, nuggets)	155°F
Egg dishes cooked for later service	155°F
Ham, bacon, and other injected meats; roasted meats (beef, pork, veal, lamb, commercially-raised game animals)	145°F
Fish and foods containing fish	145°F
Fruits & vegetables, cooked for service	135°F

## Corrective Action Plans

Risk Factor	Corrective Action
Food is from an unapproved source or is in unsound condition.	Discard or reject the food.
Food handling employee is observed not washing hands at the appropriate times.	Instruct the employee on when and where to wash hands.
A TCS (time/temperature control for safety) cold food is held above 41°F for more than 4 hours.	Discard the food.
A TCS food is not cooked to the proper internal temperature.	Continue cooking the food and check it again. Repeat until minimum temperature is reached.
A cooked TCS food falls below the 135°F hot holding threshold on the serving line.	Discard the food or reheat to 165°F in less than 2 hours and hold at 135°F or above.
In the two-stage cooling process, a TCS food is cooled from 135°F to 70°F in more than 2 hours.	Discard if food is not cooled to 70°F in first 2 hours in this first stage of cooling.
In the two-stage cooling process, a TCS food is cooled from 135°F to 41°F in more than 6 hours.	Discard if not cooled to 41°F in a total of 6 hours as required using the two stages of cooling.
A TCS food is not reheated to 165°F within 2 hours.	Discard food if reheat takes more than 2 hours.








## Module 3: Quick Quiz

Quiz yourself to see how much information you remembered!

1. The Temperature Danger Zone is the range where bacteria grow at a rapid pace and is between,
  - a. 70°F to 140°F
  - b. 41°F to 135 °F
  - c. 41°F to 165°F
  - d. none of the above
2. The most important reason to cook foods to the proper internal temperatures is,
  - a. to ensure the food tastes good
  - b. to make sure the food is the correct color and texture
  - c. to destroy harmful microorganisms that could cause foodborne illness
  - d. none of the above
3. The best and safest way to determine that food is cooked correctly is,
  - a. to use a thermometer and ensure the product reaches the proper internal temperature
  - b. to follow the recipe for the amount of time indicated
  - c. to look at the product to see if it is done.
  - d. to press on the product to test for firmness
4. The ideal temperature range for a cooler is between 34°F and 41°F. Which of the following is true for Time and Temperature Control for Safety (TCS) foods stored in the cooler?
  - a. cooler temperatures kill all harmful bacteria
  - b. cooler temperatures slow the growth of harmful bacteria
  - c. cooler temperatures make the food taste better
  - d. none of the above
5. To check the internal temperature of a food, where should the food thermometer be placed?
  - a. all the way through to the other side
  - b. at the edge of the food
  - c. in the middle or thickest part of the food
  - d. none of the above
6. Which of the following is safe for thawing frozen TCS foods?
  - a. In the refrigerator
  - b. Under cool 70°F running water
  - c. As part of the cooking process
  - d. All of the above
7. If raw hamburger was left out on the counter overnight, the best thing to do is,
  - a. cook it to 160°F right away
  - b. put it in the cooler immediately
  - c. put it in the freezer immediately
  - d. discard it
8. If raw meat juices drip on ready-to-eat (RTE) foods like fresh fruit, you should,
  - a. serve RTE food right away
  - b. discard RTE food immediately
  - c. rinse RTE food with cool water and store in the cooler
  - d. wipe off meat drippings with a disposable paper towel and serve RTE food

## TCS Foods Answer Key

These foods should be handled with time and temperature controls for safety. They are TCS foods.

## Quick Quiz Answer Key

- b.** Bacteria grow rapidly between 41°F to 135°F. This is the Temperature Danger Zone (TDZ). Move foods out of the TDZ quickly to prevent harmful microorganisms from growing.
- c.** Different foods have different internal temperature requirements that need to be achieved. Cooking TCS foods to their proper internal temperature controls growth of microorganisms.
- a.** Use a food thermometer to check the internal temperature of a TCS food to ensure it is cooked correctly. E.g., leftovers must be reheated to a proper internal temperature of 165°F within 2 hours to be safe to eat.
- b.** The growth of microorganisms is slowed by the cold temperatures of the refrigerator. A freezer prevents the growth of bacteria since bacteria need water to grow. If the water is frozen, bacteria cannot use it to thrive. Bacteria do not die in the freezer but exist in a dormant state.
- c.** When checking the temperature of a TCS food, insert the thermometer in the thickest part of the food or in the middle of a pan of food. This is to ensure that all parts reach a safe internal temperature.
- d.** You can safely thaw frozen TCS foods in the refrigerator, under cool running water at 70°F or below, or thaw as part of the cooking process. Using a microwave to thaw food is acceptable as long as the product is cooked to its proper internal temperature right away.
- d.** It is not safe to thaw TCS frozen foods at room temperature. Harmful bacteria can grow to harmful levels in 4 hours and can deposit waste products called toxins on the foods as they grow and die.
- b.** Raw meat juices carry many types of harmful bacteria. If the meat juices drip onto a ready-to-eat (RTE) food, this cross contamination can make the RTE food unsafe to eat.

# Module 4: Cleaning and Sanitizing



Cleaning and sanitizing food preparation equipment is an important part of keeping food safe. Surfaces that come into contact with food, such as food preparation counters and serving lines, should be regularly cleaned to prevent the spread of bacteria and reduce the possibility of cross-contamination. A surface or item that is in continuous use should be cleaned and sanitized at least every four hours.

## Clean

Cleaning is the removal of physical soil and food on the surfaces of equipment and utensils.

- Clean sinks before using them for manual ware washing of items.
- Scrape food debris into garbage disposal or trash receptacle.
- Wash equipment or surfaces in a hot water and detergent solution.
- Change soapy water as often as necessary to keep it clean.



## Rinse

Rinsing is removal of detergents and abrasives.

- Immerse items in clean clear hot water or wipe stationary equipment with a rinse cloth to remove soaps.
- Sanitizer will not work unless the detergents and abrasives are removed.

## Sanitize

Sanitizing is reducing the number of harmful microorganisms to a safe level.

- This treatment is applied after cleaning and rinsing surfaces.
- Sanitize by immersion in very hot water or in a dish machine.
- Sanitize by immersion in an approved chemical sanitizer solution or in a dish machine.
- Sanitize by spraying the food contact surface with an approved chemical sanitizer solution.



Chemical sanitizing solutions must be mixed following manufacturers' instructions for dilution.

- Chlorine is mixed with 50°F-100°F water to a concentration of 50-100 ppm (parts per million).
- Quaternary ammonia is mixed with water 75°F or hotter to a concentration of 200 ppm.
- Using a stronger concentration of a sanitizer could result in chemical contamination.
- Using a weaker concentration of a sanitizer will not effectively reduce harmful microorganisms to safe levels.
- Test the concentration by using the test strips appropriate for the sanitizing solution used.
- Store sanitizers and all chemicals in labeled containers separate from foods and food contact surfaces.

## Air Dry

Allow all utensils and equipment to air dry. Kansas Food Code specifies air dry to avoid the recontamination of surfaces.



## Cleaning & Sanitizing Steps

Cleaning and sanitizing practices are important to preventing cross contamination of harmful microorganisms from equipment to foods. Food contact surfaces, such as knives, cutting boards, slicers, preparation counters, and/or mixing bowls should be cleaned and sanitized by following these steps:



1

*Scrape food debris*



2

*Wash with detergent and water*



3

*Rinse with clear water*



4

*Sanitize*

5

*Allow surface to air dry*

## Pest Control

Insects and rodents carry disease and can contaminate food and food contact surfaces. Protect outer doors and windows with tight fitting screens, door sweeps, and air curtains to prevent pests from getting access. Use food-safe pest control methods or contracted pest control services to assist with those unwanted pests.



## Module 4: Quick Quiz

Quiz yourself to see how much information you remembered!

1. Procedure for manual washing of dishes, pans, and utensils
  - a. wash with cold water and soap, rinse, and air dry
  - b. wash with hot water and soap, rinse, sanitize, and air dry
  - c. wash with hot water and soap, rinse, and towel dry
  - d. none of the above
  
2. Cutting board should be washed, rinsed, and sanitized after cutting raw chicken and before cutting vegetables for a salad.
  - a. Yes
  - b. No
  
3. The Kansas Food Code requires that food contact surfaces and utensils be routinely  
 W\_\_\_\_\_, R\_\_\_\_\_, and S\_\_\_\_\_.
  
4. How often should food contact surfaces or food equipment that is in continuous use be washed, rinsed and sanitized?

At least every \_\_\_\_\_ hours.

## Word Search

### Cleaning and Sanitizing

JustWordSearch.com

X P Z S T H E R M O M E T E R J D W  
 J R R P G E T N E M P I U Q E B Q Q  
 B G A J E V D K M S G N I N A E L C  
 Z O D M U H X O X I P A S P T N N Q  
 J R A B S O Q E C R V U E G T K R J  
 Z E R O P I L A P D U U C S Z S U F  
 O T W X Q O N G J L O I M D N M Q Z  
 E A Z A P C K A A Q M O E Y T I P G  
 R W O X S E W C G M F T F K R U R X  
 A H M U M H I O E R E L Q N C Z I K  
 I C R B Z M I R Q R O U T I H B J E  
 R A R K E C S N G A I O N S L L P T  
 E E G H C I W E G H C O R Q O S J F  
 T L C U O O N F P H S M N C R L J G  
 C B F N J T B G I F I N V F I X J T  
 A K Y Y D I S H W A S H E R N M Q Y  
 B U M K D G C F D S L T Q X E U G P  
 S T E Y K K J U S A N I T I Z E U E

CLEANING  
 SINK  
 MICROORGANISM  
 DETERGENT  
 CHLORINE  
 BLEACHWATER  
 IMMERSION  
 BACTERIA  
 CHEMICAL  
 DISHWASHER  
 RINSE  
 SANITIZE  
 WASHING  
 EQUIPMENT  
 FOODCODE  
 THERMOMETER



## Module 4: Quick Quiz Answer Key

1. **b.** Food establishments that do not have automatic warewashing equipment must have a sink with at least three compartments for manual washing, rinsing and sanitizing of equipment, utensils, and tableware.
2. **Yes,** it is important to wash dishware, equipment, and food contact surfaces with soap and hot water after each use. They should then be rinsed and sanitized to reduce the risk of harmful bacteria contaminating food. Raw poultry juices contain harmful bacteria that could make people sick.
3. The Kansas Food Code requires that food contact surfaces and utensils be routinely **Washed, Rinsed, and Sanitized.** Clean with soap and hot water to remove debris, rinse to remove soap residue, and sanitize to reduce levels of harmful bacteria.
4. A surface or item that is in continuous use should be cleaned and sanitized **at least every four hours.**

## Word Search Answer Key

### Cleaning and Sanitizing

JustWordSearch.com

X P Z S J D W  
 J R R P G B Q Q  
 B G A J E V K M S  
 Z O D U H X X I P A S P T N N Q  
 J A B O Q E R V U G T K R J  
 Z R O P L A P U U C Z S U F  
 O X Q O G J M M Q Z  
 E Z P C K Q Y T P G  
 R O X E W F R U X  
 M U M O L Q Z I K  
 R B Z Q U T B J E  
 R K C A I N L P T  
 G C W H C O Q S J F  
 U O F P H S M N L J G  
 F J B G I F I N V F X J T  
 K Y Y Q Y  
 U M K D G C F D S L T Q X U G P  
 S T E Y K K J U U E

CLEANING  
 SINK  
 MICROORGANISM  
 DETERGENT  
 CHLORINE  
 BLEACHWATER  
 IMMERSION  
 BACTERIA  
 CHEMICAL  
 DISHWASHER  
 RINSE  
 SANITIZE  
 WASHING  
 EQUIPMENT  
 FOODCODE  
 THERMOMETER

# Module 5: Allergen Awareness

## Food Allergies

A food allergy is an immune system response to a protein in a food or food ingredient that the body mistakenly believes is harmful. Components of a food that trigger the immune system are called food allergens. When a food containing an allergen is eaten, or when there is a significant exposure to a food allergen, a reaction can occur in some people.

### Common Food Allergy Symptoms

- Nausea and/or vomiting
- Scratchy throat
- Nasal congestion
- Difficulty swallowing
- Shortness of breath
- Wheezing
- Hives / rashes
- Itching
- Swelling of body parts (face, hands, feet)
- Abdominal pain / stomach cramps
- Diarrhea



Allergic reactions to foods can be life threatening. Anaphylaxis is a rare but potentially fatal condition in which several different parts of the body experience the allergic reaction simultaneously. Reactions usually begin within minutes of exposure, but can be delayed. The most dangerous symptoms are low blood pressure, breathing difficulties, shock, and loss of consciousness, all of which can be fatal. Immediate medical attention is necessary and often includes an injection of epinephrine, an adrenaline that opens the airway and blood vessels.

## Food Intolerances

Sometimes a reaction to a specific food is not an allergy, but another type of reaction called a “food intolerance.” A food intolerance is an adverse reaction to food that does not normally involve the immune system. Food intolerances can produce some of the same symptoms as food allergies but they develop through different mechanisms.

Because symptoms of food allergies and food intolerances can be similar, it is important that these symptoms be evaluated and diagnosed by a licensed medical authority.

- A food allergy will generally be considered a disability if it impacts a major life activity or a major bodily function such as digestion, respiration, immune response, or skin rash.
- A food intolerance **may** be considered a disability if it substantially limits a major life activity. For example, if a child’s digestion (a major bodily function) is impaired by gluten intolerance, the condition may be considered a disability.

## Common Food Allergens

Although many foods have the potential to cause an allergic reaction, nine food categories account for 90% of the total of food allergies in the United States.

1. **Peanuts** (grow on plants)
2. **Tree Nuts** (grow on trees)
3. **Milk**
4. **Eggs**
5. **Soy**
6. **Wheat**
7. **Fish**
8. **Crustacean Shellfish**
9. **Sesame**

If a food product contains one of the top common allergens, laws requires the product be labeled clearly with this information.

1. **Peanuts** - peanuts, peanut oil, mixed nuts, peanut butter, candies, ice cream
2. **Tree nuts** - almonds, brazil nuts, cashews, chestnuts, hickory nuts, macadamia nuts, almond paste or extract, nougat, nut butters, pecans, pesto, pine nuts, pistachios, walnuts, other nut extracts
3. **Milk** - butter, buttermilk, cheese, cream, cottage cheese, custard, ice cream, sherbet, nougat, pudding, sour cream, yogurt, casein, lactose, whey
4. **Egg** - egg, egg substitute, macaroni, mayonnaise, meringue
5. **Soy** - tofu, miso, soy sauce, tamari sauce
6. **Wheat** - bran, bread crumbs, crackers, flours, gluten, granola, pastas, soy sauce, starch, modified food starch, hydroluzed vegetable protein
7. **Fish** - bass, cod, flounder, anchovies, tuna
8. **Shellfish** - clams, crab, crawfish, lobster, mollusks, mussels, oysters, scallops, shrimp, seafood flavorings
9. **Sesame** - There is a new law that requires foods containing sesame to indicate it on the packaging by January 2023. The law officially makes sesame the ninth major allergen. Sesame in current ingredient listings may be disguised as a “natural flavor” or “natural spice.” This can make it difficult for a person to identify and avoid the ingredient.

## Prevent Exposures to Allergens

- **Read food labels.** Develop a system of reading labels for every item served to a person with food allergies and maintain contact information for manufacturers.
- **Know what foods to avoid and how to substitute.** Evaluate which menu items contain common food allergens and identify customers who are known to have an allergic response to certain foods. Know what to avoid and how to make appropriate substitutions.
- **Avoid Cross-Contact.** Cross-contact can happen when an allergen is transferred from a food containing an allergen to a food that does not contain the allergen. Cross-contact can also occur by putting food on a surface that has touched allergens.

### To reduce the possibility of cross-contact:

- Wash, rinse, and sanitize cookware, utensils, and equipment before use.
- Wash hands and change gloves and apron before preparing foods for customers who have food allergies.
- Prepare food for customers with food allergies in a separate area away from other foods or prepare their food before preparing other foods.
- Label food packaged on-site for retail sale. Name all major allergens on the label and follow any additional labeling requirements.

## What Did Ms. Sani Tation Do Wrong?

**Directions:** Ms. Sani Tation, a school food service cook, is making chicken veggie wraps for lunch. The production sheet indicates that one student is allergic to wheat. Circle the step(s) where Ms. Sani Tation makes a mistake and then explain why.



1. Ms. Sani Tation washes her hands and changes her gloves before making the wrap.



2. Ms. Sani Tation dusts bread crumbs off a cutting board before chopping vegetables on it.



3. Ms. Sani Tation chops the vegetables with a knife used to prepare another wrap.



4. Ms. Sani Tation moves the multigrain wheat tortillas to the side to grab a corn tortilla for the wrap for the student with the wheat allergy.



5. Ms. Sani Tation places the corn tortilla on a clean dish to finish it.



6. Ms. Sani Tation places the finished wrap on a separate serving tray, then wraps the tray and refrigerates until service.

**Answer Key:** Pictures 2, 3, and 4 should be checked.

**Picture 2:** She should have used a washed, rinsed, and sanitized cutting board for chopping vegetables. Since she brushed the crumbs off the cutting board with her gloved hand, she would have to wash her hands and change her gloves as well.

**Picture 3:** She should have used a clean knife for preparing the wrap for the student allergic to wheat.

**Picture 4:** She caused cross-contact with wheat allergens. She was careful to choose a corn tortilla that does not contain wheat, but she touched the multigrain wheat tortillas beforehand. The corn tortillas should not be stacked next to the wheat tortillas.

## Module 5: Activity

Check the foods that are likely to contain one of the top 8 allergens.

- Rice
- Watermelon
- Peanut butter & jelly sandwich
- Whole wheat bread
- Lasagna with cottage cheese
- Tuna fish wrap
- Rice cereal
- Ice tea
- Orange
- Crab meat salad
- Trail mix
- Mashed potato
- Yogurt parfait
- Shrimp scampi
- Apple
- Green peppers
- Banana nut muffin
- Tofu cheesecake
- Corn
- Egg and cheese burrito



Answers: peanut butter and jelly sandwich, whole wheat bread, lasagna, tuna fish wrap, crab meat salad, trail mix, yogurt parfait, shrimp scampi, banana nut muffin, tofu cheesecake, egg & cheese burrito

## Module 5: Quick Quiz

Quiz yourself to see how much information you remembered!

1. The best treatment for food allergies is,
  - a. to have weekly allergy shots
  - b. to drink lots of water to dilute the allergen
  - c. to prevent exposure
  - d. to take two aspirin
  
2. Food intolerances are different from food allergies because they do not involve,
  - a. the same symptoms
  - b. diagnoses by a medical professional
  - c. the same foods
  - d. the immune system
  
3. Symptoms of an allergic reaction may include
  - a. itchy mouth
  - b. hoarseness
  - c. nausea
  - d. all of the above
  
4. Anaphylaxis
  - a. is nothing to worry about
  - b. is a reaction to a food intolerance
  - c. is a potentially life-threatening medical condition
  - d. should not be treated with medication
  
5. A food service worker can prevent cross-contact by engaging in which of the following practices?
  - a. washing hands and changing gloves and apron before preparing foods
  - b. washing, rinsing, and sanitizing equipment before use.
  - c. preparing foods for people with food allergies before preparing other foods.
  - d. all of the above

Answers: 1c, 2 d, 3d, 4c, 5d

For more information on food allergies, recipes, and management plans, visit the following organizations:

School Nutrition Association  
(SNA)  
[www.schoolnutrition.org](http://www.schoolnutrition.org)

Food Allergy and Anaphylaxis  
Network (FAAN)  
[www.foodallergy.org](http://www.foodallergy.org)

# Glossary

The following are some common terms associated with foodborne illness:

**Bacteria:** Living single-celled organisms. They can be carried by water, wind, insects, plants, animals, and people. Bacteria survive well on skin and clothes and in human hair. They also thrive in scabs, scars, the mouth, nose, throat, intestines, and Time and Temperature Control for Safety (TCS) foods.

**Biological hazard:** Refers to the danger of food contamination by disease-causing microorganisms (bacteria, viruses, parasites, or fungi) and their toxins.

**Contamination:** The unintended presence of potentially harmful substances in food. Contamination can occur through chemicals, physical contaminants (glass), and biological contaminants (microorganisms).

**Cross-contamination:** The transfer of harmful substances or disease-causing microorganisms to food by hands, equipment (food-contact surfaces, sponges, cloth towels, and utensils) and other contaminated foods that touch ready-to-eat foods.

**Foodborne illness:** A disease that is carried or transmitted to humans by food containing harmful substances. Examples are the disease salmonellosis, which is caused by *Salmonella* bacteria and the disease botulism, which is caused by the toxin produced by the bacteria *Clostridium botulinum*.

**Food contact surface:** Any equipment or utensil that normally comes in contact with food or that may drain, drip, or splash on food or on surfaces normally in contact with food. Examples: cutting boards, knives, dish towels, aprons, countertops, and colanders.

**Fungi:** A group of microorganisms that includes molds and yeasts.

**Microorganism:** A small living thing (often microscopic), that may cause disease. Examples include bacteria, fungi, parasites, and viruses.

**Parasite:** A microorganism that needs a host to survive. Examples: *Cryptosporidium*, *Toxoplasma*.

**Pathogen:** A harmful microorganism that is infectious and causes disease.

**Spore:** A thick-walled protective structure produced by certain bacteria and fungi to protect their cells. Spores often survive cooking, freezing, and some sanitizing measures.

**Toxins:** Poisons that are produced by microorganisms, carried by fish or released by plants. Examples: Botulism caused by the toxin from *Clostridium botulinum*, scombroid poisoning from the naturally occurring scombroid toxin in some improperly refrigerated fish, such as mackerel and tuna.

**Virus:** A protein-wrapped genetic material which is the smallest and simplest life-form known. Example: Norovirus, hepatitis A