Food Safety
for
Volunteers & Students

Food Safety is Everyone’s Responsibility!
January 2013
This class was developed by Child Nutrition & Wellness, Kansas State Department of Education. Class content and activities were adapted from the following sources:

- **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
- The University of Rhode Island, Rhode Island Food Safety Education, Employee Education, [Volunteer Food Service Worker Training 2012](http://www.ksre.ksu.edu/foodsafety/)
- 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/](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
- The Food Allergy & Anaphylaxis Network, [www.foodallergy.org](http://www.foodallergy.org); faan@foodallergy.org

This publication has been funded at least in part with Federal funds from the U.S. Department of Agriculture, Food and Nutrition Service. The contents of this publication do not necessarily reflect the views or policies of the Department, nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government.

**Kansas State Department of Education**

Dr. Diane M. DeBacker  
Commissioner, 785-296-3202

Dale M. Dennis, Deputy Commissioner  
Fiscal & Administrative, 785-296-3871

Brad Neuenswander, Deputy Commissioner  
Division of Learning Services, 785-296-2303

**For further information, please contact:**  Child Nutrition & Wellness, 120 SE 10th Avenue, Topeka, Kansas 66612, 785-296-2276, Fax: 785-296-0232, [www.kn-eat.org](http://www.kn-eat.org), Cindy L. Johnson, Training Coordinator, cljohnson@ksde.org

In accordance with Federal law and U.S. Department of Agriculture policy, this institution is prohibited from discriminating on the basis of race, color, national origin, sex, age, or disability. To file a complaint of discrimination, write to USDA, Director, Office of Adjudication, 1400 Independence Avenue, SW, Washington DC 20250-9410 or call (866) 632-9992 (Voice). Individuals who are hearing impaired or have speech disabilities may contact USDA through the Federal Relay Service at (800) 877-8339; or (800) 845-6136 (Spanish). USDA is an equal opportunity provider and employer.

The following person has been designated to handle inquiries regarding the non-discrimination policies at the Kansas Department of Education:  KSDE General Counsel, 120 SE 10th Avenue, Topeka, KS 66612, (785)296-3201.

**Publication Date:** January 2013
Food Safety for Volunteers & Students

Table of Contents

Introduction ........................................................................................................................................Page 1
Module 1: Food Safety is in YOUR Hands .........................................................................................Page 2
Module 2: Foodborne Illness .............................................................................................................Page 8
Module 3: Handle with Care ..............................................................................................................Page 12
Module 4: Cleaning and Sanitizing .................................................................................................Page 18
Module 5: Allergen Awareness ..........................................................................................................Page 22
Glossary .............................................................................................................................................Page 28

Child Nutrition & Wellness
Kansas State Department of Education
Introduction

Developing and implementing a food safety training program is important to keep young customers healthy and safe. Offering quality foods that are safe to eat begins with knowledgeable food handlers. This workbook concentrates on areas that are critical to food safety including personal hygiene, preparing and serving foods, cleaning and sanitizing, and food allergies.

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

Employees need:
- Information to do the job correctly
- Tools to do their job effectively and safely
- A work environment that encourages and rewards correct food safety behaviors

Child Nutrition Programs 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 or quizzes to reinforce learning. This is an ideal tool to use as a food safety refresher, as an introduction to food safety for a new employee 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 Illness
- Microorganisms
- Time/ Temperature Control for Safety

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 the food. Activities such as smoking, eating, drinking, handling raw foods, dispensing garbage, using the restroom, and touching the face are all sources of possible contamination. This contamination can make others sick. By practicing good personal hygiene and following food safety practices, the risk of a foodborne illness can be reduced.

Personal Hygiene – Food Safety Practices

- Do not eat, drink or use tobacco in any form in food production areas.
- Sick employees should not come in contact with food.
- Symptoms such as diarrhea, vomiting, fever, infection, and jaundice would require an employee to stay at home or be sent home.
- Do not use a common towel or apron to wipe hands and face.
- Utensil used for tasting must not be put back in the food to be served.
Personal Hygiene

Personal hygiene is an essential step in preventing foodborne illness.

- Daily bathing and brushing of teeth are important to minimizing growth of harmful microorganisms.
- Wear clean clothes and be aware of activities that could contaminate clothes.
- If available, add an additional barrier of a clean apron to protect food from contaminates on clothes.
- Remove apron when leaving food preparation areas (breaks and restroom use).
- Jewelry for food handlers is limited to a plain ring band and simple earrings.
- Food handlers should have nails that are short, smooth, clean and unpolished.
- Artificial nails are strongly discouraged for those that handle food in child nutrition programs.

Hair Restraints

The Kansas Food Code requires food employees to wear hair restraints or clothing that effectively keep hair from contacting food and food contact surfaces.

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

Wash hands 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 in the soap and water.
- Rinse to remove the soap.
- Air dry or dry using a disposable paper towel.

Glove Use

No Bare-Hand Contact Rule

The Kansas Food Code requires that single-use gloves be worn in certain circumstances.

- Gloves should be worn to cover an injury on the hand such as a cut, scrape, or burn.
- Ready-to-eat foods and ice must not be handled with bare hands.
- Wash hands then put on single-use gloves.
- Do not blow in the gloves to create an opening.
- Gloves get contaminated easily. Use gloves for one task and then discard.
- Reusable gloves may not be used when handling ready-to-eat foods or ice.

Food Safety Is YOUR Responsibility!
Module 1: Risky Business Activity

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

1. Henrietta cut her finger on the lid of a can. She covered the cut with a bandage and continued with preparing items for the fruit and vegetable bar.

2. Kaye is wearing a medical bracelet while preparing the Stromboli for today’s lunch.

3. Tom has grown a beard but does not consider it to be long enough to wear a restraint.

4. Barb felt sick a few hours after getting to work. After an episode of vomiting she told her supervisor that she would need to go home.

5. Joe did not have time to change from his farm business ball cap to his food service ball cap and went immediately to serving food on the line.

6. Nancy, the dishwasher, washed her hands between handling the dirty dishes and unloading the clean dishes.

7. Sue hid her cell phone in her utensil drawer so she could easily get it when a call came in.

8. Mark had been in food production since 6:00 am and had several food stains on his apron. At 11:00 am he decided to change into another apron for serving food on the line since it had been over 4 hours since he had put on the apron in the morning.

9. Kathy collected all the ingredients she would need for her cookie recipe in advance to avoid contaminating her hands after starting the mixing process.

10. Peggy took her apron off before going into the restroom to reduce the risk of contaminating it.

Risky Business Activity Answers

Activities 1, 2, 3, 5 & 7 are risky.
# Handwashing Myths & Misunderstandings

<table>
<thead>
<tr>
<th>Myths &amp; Misunderstandings</th>
<th>Truth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very hot water is necessary.</td>
<td>The most effective water temperature is about 100°F. This is comfortably warm to most people. Using water that is too hot removes protective oils naturally found on skin.</td>
</tr>
<tr>
<td>Antimicrobial soap is necessary.</td>
<td>Studies have shown that ordinary soaps work just as well at preventing bacteria and germ transmission as antimicrobial soap products.</td>
</tr>
<tr>
<td>Cloth towels work fine to dry hands.</td>
<td>Bacteria numbers increase in damp towels leading to recontamination of hands. A disposable paper towel is the best choice for drying hands.</td>
</tr>
<tr>
<td>Hand sanitizers are just as good as washing.</td>
<td>Hand sanitizers do not work on soiled hands and are ineffective against some viruses. Washing with soap and water is the best bet for clean hands.</td>
</tr>
<tr>
<td>It is only necessary to wash hands after using the bathroom.</td>
<td>Wash hands after contact with any source of possible contamination. This includes contact with fecal material from using the restroom, changing a diaper, or petting an animal. Wash hands after any contact with juices from uncooked meats and poultry. Wash hands before preparing foods and before eating. Other sources of contamination include items that are touched by many people such as money, phones, copiers, counters, door handles, etc.</td>
</tr>
</tbody>
</table>

(Adapted from 5 Myths of Handwashing, March 2007, Iowa State University)
Module 1: Crossword

Food Safety Is In Your Hands

ACROSS
4 Length of time for effective handwashing in warm soapy water
6 This important step must be done before putting on single-use gloves
8 Restraints required to protect food and food contact surfaces from contamination
9 This product can be used after handwashing but not in place of handwashing

DOWN
1 Ready-to-eat foods should be handled with these single-use items
2 Type of nails that are strongly discouraged in child nutrition programs because they can harbor bacteria
3 This additional barrier helps to protect the food and food contact surfaces from any contaminates that may be on your clothes
5 Brushing of these will help limit growth of harmful micorganisms
7 These employees should not come in contact with food
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 contaminates in food 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, also known as pathogens, can contaminate food and cause symptoms, such as vomiting, abdominal cramps, and diarrhea. Food that is mishandled can even cause more serious consequences in the body, such as kidney failure and neuromuscular problems. According to a study done in 2011, foodborne illnesses even accounted for an estimated 3,000 deaths in the United States!

Microorganisms

Microorganisms are small living things.

Pathogens like E. coli O157:H7, Listeria, or Salmonella may be present on food items when they are purchased. It is, therefore, crucial to keep these pathogens 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, and cooling them correctly.
Conditions for Bacterial Growth

Foods that support the rapid growth of harmful microorganisms are called Time/Temperature Control for Food Safety (TCS) foods or potentially hazardous foods. Bacteria are a type of microorganism that can be controlled if food is handled correctly. Bacteria can get in food from hands, equipment, or other foods.

Bacteria need favorable conditions to grow to harmful levels.

Bacteria like TCS foods

- Identify foods that require time/temperature control for safety.
- TCS foods support the rapid growth of harmful microorganisms.

**Time**

- Bacteria double every 20-30 minutes in favorable conditions.
- Minimize time in the temperature danger zone to 4 hours or less.

**Temperature**

- 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 a proper internal temperature destroys most of the bacteria.
- Hot potentially hazardous foods must be held at or above 135°F.
- Cold potentially hazardous foods must be held at or below 41°F.

**Moisture**

- Bacteria are life forms and moisture is important to survival and growth.
- Foods that have been dried are less likely to grow bacteria due to low moisture contents.

**Acidity**

- Acidity level (pH) affects bacterial growth.
- 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.

**Oxygen**

Bacteria differ in their requirements 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. You can tell when food is safe to eat by using,
   a. sight
   b. smell
   c. taste
   d. none of the senses

2. Harmful bacteria can contaminate food from what source(s)?
   a. hands
   b. equipment
   c. other foods
   d. all of the above

3. What conditions are needed 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. **d**, You cannot determine whether a food is unsafe to eat just by looking at it or smelling 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 bacteria and viruses can be found everywhere—on animals, on people, on equipment and in contaminated food. You cannot see or smell harmful microorganisms, but they are present. They can spread throughout the kitchen by hands, countertops, utensils, and other foods. Wash hands and anything used to prepare and store foods.

3. **d**. Bacteria grow rapidly when they have food (nutrients), moisture, warm temperatures and time to grow. Help prevent the growth of bacteria by holding foods at the proper temperatures and cooling food quickly.

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 cause 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 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

Cooking food safely is a matter of degrees! Foods are cooked when they reach a proper internal temperature as determined by the Kansas Food Code or Child Nutrition Program guidelines. For example, reheated foods must reach 165°F within 2 hours to be safe for service.

It is crucial for food safety to know how to take the temperature of potentially hazardous foods, also known as TCS foods. TCS foods are those that require time and temperature control for safety. Keep food thermometers in good condition. They must be cleaned and sanitized after each use. They should be calibrated every 2 weeks for accuracy.

<table>
<thead>
<tr>
<th>Thermometer Upkeep</th>
<th>Wash, rinse and sanitize food thermometer after each use. Store thermometer in its case and put it in a safe place.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calibration</td>
<td>Food thermometers should be calibrated every two weeks and adjusted as needed. Check a thermometer if it has been dropped. Calibrate by using an ice bath, and adjusting to 32°F.</td>
</tr>
<tr>
<td>Taking Temperatures</td>
<td>Holding the food thermometer by the top dial portion, insert the stem into the thickest part of the food. Allow a few seconds for the temperature to register.</td>
</tr>
</tbody>
</table>
Time & Temperature Control for Safety (TCS) Foods

Most foods given enough time can support the growth of harmful microorganisms (pathogens). A TCS food or potentially hazardous food allows the rapid growth of pathogens and requires more care when handling.

Common TCS foods are
- milk and dairy products
- 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

Do Time and Temperature Controls for Safety principles apply?
Circle the TCS foods.

- Hold hot cooked TCS foods at an internal temperature of 135°F or higher for service.
- Hold cold ready-to-eat TCS foods at an internal temperature of 41°F or lower for service.
- Proper holding temperatures must be maintained during transportation to another site.
- Take and record temperatures of TCS foods.
Cooling

The Kansas Food Code requires that all cooked foods not prepared for immediate service be cooled as quickly as possible to control the growth of bacteria. There are two methods to cool TCS foods to below 41°F: the two-stage method and the one-stage method.

<table>
<thead>
<tr>
<th>Two-Stage Cooling Method</th>
<th>The two-stage cooling method reduces the cooked food’s internal temperature in two steps. Step one is to reduce the temperature from 135°F to 70°F within 2 hours and from 70°F to 41°F within an additional 4 hours. Total cooling time should never exceed 6 hours.</th>
</tr>
</thead>
<tbody>
<tr>
<td>One-Stage Cooling Method</td>
<td>The one-stage cooling method involves reducing the cooked food’s internal temperature to 41°F or colder within four hours.</td>
</tr>
</tbody>
</table>

The following cooling procedures are recommended for quick cooling of TCS foods:

- Place the food in shallow pans in the cooler. Leave pan partially uncovered.
- Divide the food into smaller portions (e.g. 1 gallon increments) and put into the cooler.
- Use rapid cooling equipment, such as blast chillers.
- Place the container of food to be cooled in an ice bath and stir food.
- Add ice in place of water as an ingredient in the recipe.
- Combine one or more of the above methods.

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

Date Marking

Harmful bacteria can grow to dangerous levels when TCS foods are held at refrigerated temperatures for extended periods of time. To monitor time in the cooler, refrigerated ready-to-eat, TCS foods must be date marked to ensure that the food is either consumed or discarded within 7 days.

Label the food item with a “use-by” date, the date by which it must be consumed, frozen, or discarded. The Kansas Food Code allows 7 days if the item is held at cooler temperatures of 41°F or below. The day the food is prepared, or the day a commercially processed food, like cottage cheese, is opened, counts as “day one”. When food is removed from the freezer, mark it with a use-by date that is 7 days minus the length of time food was refrigerated before it was frozen.
Minimum Internal Temperatures

<table>
<thead>
<tr>
<th>Food Product</th>
<th>Internal Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pork products:</td>
<td>160°F</td>
</tr>
<tr>
<td>Egg Dishes:</td>
<td>160°F</td>
</tr>
<tr>
<td>Fish:</td>
<td>145°F</td>
</tr>
<tr>
<td>Leftovers:</td>
<td>165°F</td>
</tr>
</tbody>
</table>

Poultry
- Ground 165°F
- Breasts 170°F
- Legs, thighs, whole 180°F

Beef:
- Ground 160°F
- Roast 145°F

Corrective Action Plan

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food is from an unapproved source or is in unsound condition.</td>
<td>Discard or reject the food.</td>
</tr>
<tr>
<td>Food handling employee is observed not washing hands at the appropriate times.</td>
<td>Instruct the employee on when and where to wash hands.</td>
</tr>
<tr>
<td>A TCS (time/temperature control for safety) cold food is held above 41°F for more than 4 hours.</td>
<td>Discard</td>
</tr>
<tr>
<td>A TCS food is not cooked to the proper internal temperature.</td>
<td>Continue cooking to proper internal temperature</td>
</tr>
<tr>
<td>A TCS hot food is held between 41°F and 135°F, known as the temperature danger zone.</td>
<td>Discard or reheat to 165°F in less than 2 hours. Discard if held in the temperature danger zone for more than 2 hours.</td>
</tr>
<tr>
<td>In the two-stage cooling process, a TCS food is cooled from 135°F to 70°F in more than 2 hours.</td>
<td>Discard if it is not cooled to 70°F in first 2 hours or reheat to 165°F and begin cooling process again.</td>
</tr>
<tr>
<td>In the two-stage cooling process, a TCS food is cooled from 135°F to 41°F in more than 6 hours.</td>
<td>Discard, 6 hours is too long.</td>
</tr>
<tr>
<td>In the one-stage cooling process, a TCS food is cooled from 135°F to 41°F in more than 4 hours total.</td>
<td>Discard if it is not cooled to 41°F in 4 hours in the one-stage cooling process.</td>
</tr>
<tr>
<td>A TCS food is not reheated to 165°F within 2 hours</td>
<td>Discard, it should have been reheated quickly, within 2 hours.</td>
</tr>
</tbody>
</table>
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. What is the most important reason to store Time and Temperature Control for Safety (TCS) foods in the refrigerator or cooler?
   a. cooler temperatures will kill bacteria
   b. cooler temperatures will slow the growth of 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 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. It is safe to thaw frozen meats,
   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. throw it out

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

1. **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.

2. **c.** Different foods have different internal temperature requirements that need to be achieved. Cooking TCS foods to the proper internal temperatures controls growth of microorganisms.

3. **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.

4. **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.

5. **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.

6. **d.** You can safely thaw frozen foods in the refrigerator, under cool running 70°F (or colder) water, or 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.

7. **d.** It is not safe to thaw TCS frozen foods at room temperature. Bacteria can grow to harmful levels in 4 hours and can deposit waste products called toxins on the foods as they grow and die.

8. **b.** Raw meat juices carry many types of harmful bacteria. If the juices from a TCS food drip onto a ready-to-eat (RTE) food that will receive no further cooking, the bacteria 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 the soapy water clean.

Rinse
Rinsing is removal of detergents and abrasives.
- Immerse item in clean clear hot water or wipe surface 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 sanitizers must be mixed following manufacturers’ recommendations.
- 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 sanitizer could result in chemical contamination.
- Using a weaker concentration of sanitizer could result in harmful microorganisms on food.
- Test the concentration by using the test strips appropriate for your preferred sanitizer.
- 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 in 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

CLEANING
SINK
MICROORGANISM
DETERGENT
CHLORINE
BLEACH WATER
IMMERSION
BACTERIA
CHEMICAL
DISHWASHER
RINSE
SANITIZE
WASHING
EQUIPMENT
FOOD CODE
THERMOMETER

Food Safety for Volunteers & Students * Child Nutrition & Wellness, Kansas State Dept. of Education  20
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 food safety 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. Drippings from raw poultry 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

CLEANING
SINK
MICROORGANISM
DETERGENT
CHLORINE
BLEACH WATER
IMMERSION
BACTERIA
CHEMICAL
DISH WASHER
RINSE
SANITIZE
WASHING
EQUIPMENT
FOOD CODE
THERMOMETER

Food Safety for Volunteers & Students * Child Nutrition & Wellness, Kansas State Dept. of Education 21
Module 5: Allergen Awareness

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

**Common 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

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 (adrenaline to open up the airway and blood vessels).

**Common Food Allergens**

Although any food has the potential to cause an allergic reaction, eight food categories account for 90% of the total of food allergies.

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

If a food product contains one of the 8 common allergens or an ingredient derived from one of these foods, FDA laws requires that the product be labeled clearly with this information.

1. **Peanuts** - peanuts, peanut oil, mixed nuts, peanut butter, chocolate candies, candy bars, 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, whipped cream, cottage cheese, custard, ice cream, sherbet, nougat (found in many candy bars), pudding, sour cream, yogurt, ingredients containing casein, lactose, or whey on food labels

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

Many products have hidden ingredients that could cause an allergic reaction. For example, Worcestershire sauce contains anchovies and/or sardines – both are fish. Hot dogs and many deli meats may use milk or soy as binding agents. Read labels carefully, thoroughly and regularly as ingredients sometimes change.

**Food Intolerances**

Food allergies trigger a response in the immune system while food intolerances cause adverse reactions that do not involve the immune system. Symptoms may be similar. Both situations call for an adjustment in the diet to avoid exposure.
Take Action to Prevent an Allergic Reaction

Food handlers are key players in keeping customers with life threatening food allergies safe. Preventing exposure to allergens starts in the kitchen.

- **Read food labels.** Develop a system of reading labels for every item served to a student with food allergies and maintain contact information for manufacturers.

- **Know what foods to avoid and how to substitute.** Have a list of all food ingredients to avoid and a list of approved substitutions as indicated on the medical statement on file.

- **Designate an allergy - safe zone in the kitchen.** Designate one area in the kitchen where allergy-safe meals can be made. Ensure that the food is kept safe of ingredients that students with life threatening allergies should avoid.

- **Follow safe food-handling practices.** Cross contamination of a food allergen poses a serious risk to a student with life threatening food allergies. Wash all utensils, bowls, pots, and pans thoroughly with warm soapy water, and sanitize. Additionally, clean food preparation areas by washing, rinsing, and sanitizing to remove allergens.

- **Avoid Cross-Contamination!** Cross-contamination happens when an allergen is transferred from a food containing an allergen to a food that does not contain the allergen. It can also occur by putting food on a surface that has touched allergens.

To avoid exposing students to a food allergen:

- Wash, rinse, and sanitize cookware, utensils, and equipment before each use.

- Wash hands and change gloves before preparation.

- Use separate cookware and equipment for students with food allergies.

- Prepare food for customers with food allergies in a separate area away from other food or prepare their food before 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.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Ms. Sani Tation washes her hands and changes her gloves before making the wrap.</td>
</tr>
<tr>
<td>2.</td>
<td>Ms. Sani Tation dusts crumbs off a cutting board before chopping veggies on it.</td>
</tr>
<tr>
<td>3.</td>
<td>Ms. Sani Tation chops the veggies with a knife that was used to prep another wrap.</td>
</tr>
<tr>
<td>4.</td>
<td>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.</td>
</tr>
<tr>
<td>5.</td>
<td>Ms. Sani Tation places the corn tortilla on a clean dish to finish it.</td>
</tr>
<tr>
<td>6.</td>
<td>Ms. Sani Tation places the finished wrap on a separate serving tray, then wraps the tray and refrigerates until service.</td>
</tr>
</tbody>
</table>

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

**Picture 2:** She chopped the vegetables on a dirty cutting board. The crumbs were dusted off, but they could have been from wheat products and could harm the student. She should have used a separate cutting board reserved only for chopping vegetables or washed, rinsed, and sanitized the cutting board before use. Once she brushed off the cutting board with her hand-she should have changed her gloves as well.

**Picture 3:** She did not use equipment specific to prepping food for customers with allergies. She used a knife for preparing the wraps when she should have used a clean knife for preparing the wrap for the student allergic to wheat.

**Picture 4:** She caused cross contamination with wheat allergens. She was careful to choose a corn tortilla that would not contain wheat, but she should not have touched the multigrain wheat tortillas beforehand. The wrap may contain wheat allergens as a result of cross contamination with the wheat allergens in the wheat tortillas. The corn tortillas should not be stacked next to the wheat tortillas—they should be kept separate.
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: pbj, 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 assistant can keep students with allergies safe by doing all EXCEPT
   a. saving time by not reading labels on food that has previously been served to students with allergies
   b. clean tables with a household cleaner to remove allergens
   c. designate an allergy-safe zone in the kitchen
   d. be able to identify students with food allergies

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

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

School Nutrition Association (SNA)
www.schoolnutrition.org

Food Allergy and Anaphylaxis Network (FAAN)
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