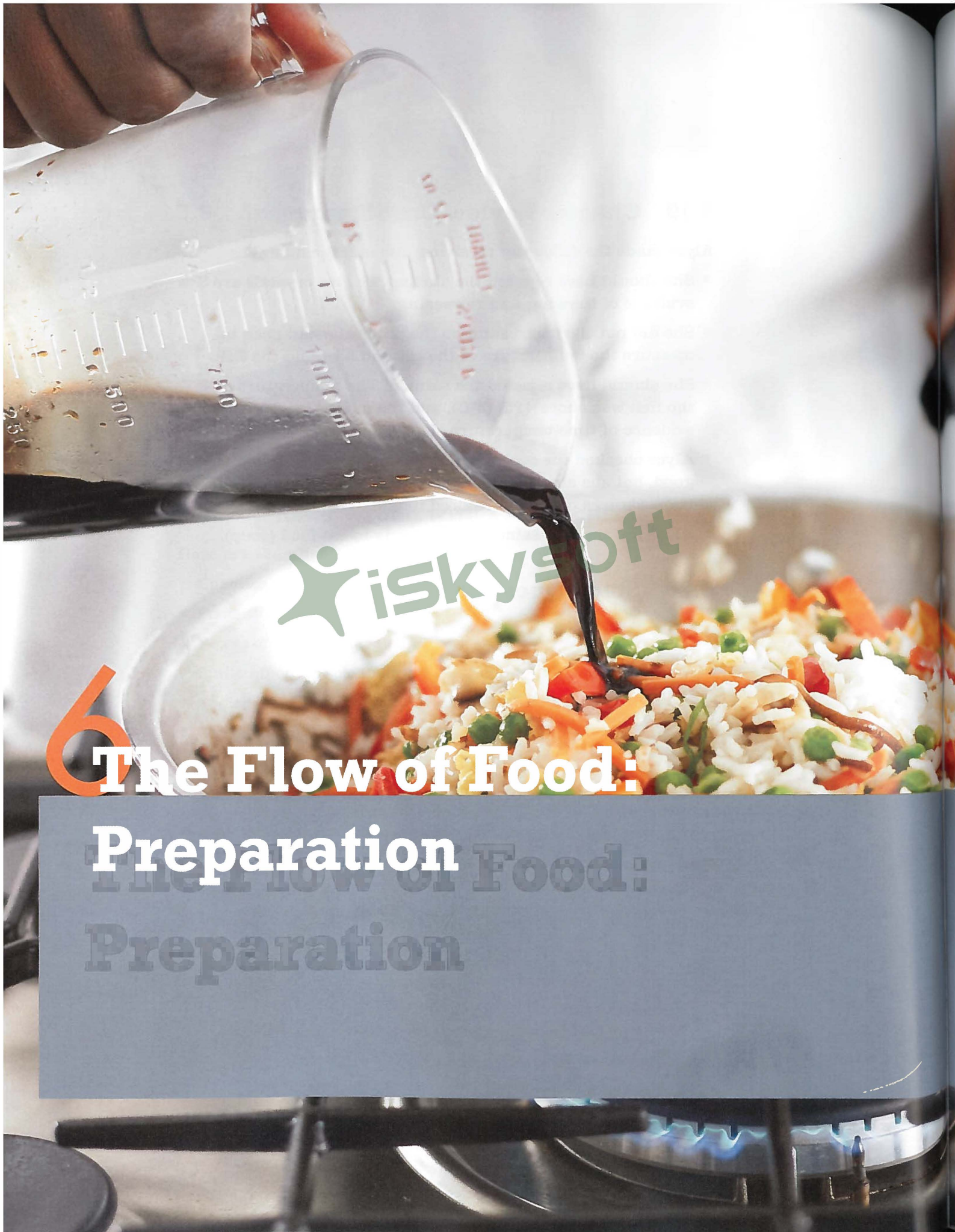


6 The Flow of Food: Preparation

Undercooked Meatballs Result in Fatal Outbreak

A 73-year-old woman died and 51 people were hospitalized after eating undercooked turkey meatballs at a buffet in the southeastern United States. The victims all got sick with *Salmonella*. An investigation revealed that the chef had browned the meatballs but failed to finish baking them. This left the centers of the meatballs undercooked.

You Can Prevent This

The illness in the story above could have been avoided if the chef had made sure that the meatballs were cooked to the correct internal temperature. In this chapter, you will learn about the specific cooking temperatures that can keep food safe. You will also learn other guidelines for keeping food safe during preparation.

Study Questions

- **What are ways to prevent cross-contamination and time-temperature abuse?**
- **What are the correct ways to thaw food?**
- **What are the minimum internal temperatures for cooking food safely?**
- **What are the correct ways to cool and reheat food to the correct temperature and in the correct amount of time?**

Preparation

Cross-contamination and time-temperature abuse can happen easily when you are preparing food. But, you can prevent pathogens from spreading and growing by making good food-prep choices.

General Preparation Practices

No matter what type of food you are prepping, you should begin by following these guidelines:

Equipment Make sure workstations, cutting boards, and utensils are clean and sanitized.

Quantity Only remove as much food from the cooler as you can prep in a short period of time. This keeps ingredients from sitting out for long periods of time. In the photo at left, the food handler has taken out too much tuna salad.

Storage Return prepped food to the cooler, or cook it, as quickly as possible.

Additives If you use food or color additives when prepping food, follow these guidelines:

- Only use additives that have been approved by your local regulatory authority. **NEVER** use more than is allowed by law. **NEVER** use additives to alter the appearance of the food.
- Do **NOT** sell produce that was treated with sulfites before it was received in the operation. **NEVER** add sulfites to produce that will be eaten raw.

Presentation Food must be offered to customers in a way that does not mislead or misinform them. Customers must be able to judge the true appearance, color, and quality of food. Do **NOT** use the following to misrepresent the appearance of food:

- Food additives or color additives
- Colored overwraps
- Lights

Food also must be presented the way it was described. For example, if your menu offers "Fried Perch," you cannot substitute another fish for the perch.

Food that has not been honestly presented must be thrown out.

Corrective actions Food that has become unsafe must be thrown out unless it can be safely reconditioned. All food—especially ready-to-eat food—must be thrown out in the following situations:

- When it is handled by staff who have been restricted or excluded from the operation due to illness
- When it is contaminated by hands or bodily fluids, for example, from sneezing
- When it has exceeded the time and temperature requirements designed to keep food safe

Sometimes food can be restored to a safe condition. This is called reconditioning. For example, a hot food that has not been held at the correct temperature may be reheated if it has not been in the temperature danger zone for more than two hours. This can return food to a safe condition.

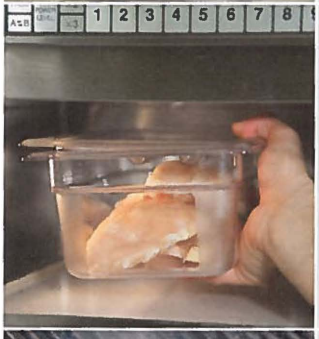
Thawing

When frozen food is thawed and exposed to the temperature danger zone, pathogens in the food will begin to grow. To reduce this growth, **NEVER** thaw food at room temperature.

General Guidelines for TCS Food

Thaw TCS food according to the methods and guidelines in Table 6.1.

Table 6.1: **Methods and Guidelines for Thawing TCS Food**

Method	Guidelines
	**Refrigeration** Thaw food in a cooler, keeping its temperature at 41°F (5°C) or lower.
	**Running water** • Submerge food under running, drinkable water at 70°F (21°C) or lower. The flow of the water must be strong enough to wash loose food bits into the drain. • Always use a clean and sanitized food-prep sink when thawing food this way. • **NEVER** let the temperature of the food go above 41°F (5°C) for longer than four hours. This includes the time it takes to thaw the food plus the time it takes to prep or cool it.
	**Microwave** • Thaw food in a microwave oven if it will be cooked immediately after thawing. • The food must be cooked in conventional cooking equipment, such as an oven, once it is thawed.
	**Cooking** Thaw food as part of the cooking process.

Thawing ROP Fish

Frozen fish may be supplied in reduced-oxygen packaging (ROP). This fish should usually remain frozen until ready for use. If this is stated on the label, the fish must be removed from the packaging at the following times:

- Before thawing it under refrigeration
- Before or immediately after thawing it under running water

Prepping Specific Food

Special care must be taken when handling ice and when preparing produce, eggs, and salads that contain TCS food.

Produce

When prepping produce, follow these guidelines:

Cross-contamination Make sure fruit and vegetables do **NOT** touch surfaces exposed to raw meat, seafood, or poultry.

Washing Wash produce thoroughly under running water. This is especially important before cutting it, cooking it, or combining it with other ingredients.

- The water should be a little warmer than the produce.
- Pay special attention to leafy greens such as lettuce and spinach, as the food handler in the photo at right is doing. Remove the outer leaves. Pull the lettuce or spinach completely apart and rinse thoroughly.
- Certain chemicals may be used to wash fruits and vegetables. Also, produce can be treated by washing it in water containing ozone. This treatment helps control pathogens. Your local regulatory authority can tell what is acceptable to use for this.

Soaking or storing When soaking or storing produce in standing water or an ice-water slurry, do **NOT** mix different items or multiple batches of the same item.

Fresh-cut produce Refrigerate and hold sliced melons, cut tomatoes, and cut leafy greens at 41°F (5°C) or lower. Many operations hold other fresh-cut produce at this temperature as well.

Raw seed sprouts If your operation primarily serves high-risk populations, do **NOT** serve raw seed sprouts.

Eggs and Egg Mixtures

When prepping eggs and egg mixtures, follow these guidelines:

Pooled eggs Handle pooled eggs (if allowed by your local regulatory authority) carefully. Pooled eggs are eggs that are cracked open and combined in a container, as shown in the photo at left. Cook them promptly after mixing, or store them at 41°F (5°C) or lower. Clean and sanitize the containers used to hold them before making a new batch.

Pasteurized eggs Consider using pasteurized shell eggs or egg products when prepping egg dishes that need little or no cooking. Examples include Caesar salad dressing, hollandaise sauce, tiramisu, and mousse.

High-risk populations If you mainly serve high-risk populations, such as those in hospitals and nursing homes, use pasteurized eggs or egg products when serving dishes that are raw or undercooked. Shell eggs that are pooled must also be pasteurized. You may use unpasteurized shell eggs if the dish will be cooked all the way through, such as with an omelet or a cake.

Salads Containing TCS Food

Chicken, tuna, egg, pasta, and potato salads have all been involved in foodborne-illness outbreaks. These salads are not usually cooked after preparation. This means you do not have a chance to reduce pathogens that may have gotten into the salad. Therefore, you must take a few extra steps. Follow these guidelines:

- Only use leftover TCS food, such as pasta, chicken, and potatoes, if it was cooked, held, cooled, and stored correctly.
- Do **NOT** use leftover TCS food that has been held for more than seven days. Check the use-by date of the stored TCS food before using it.

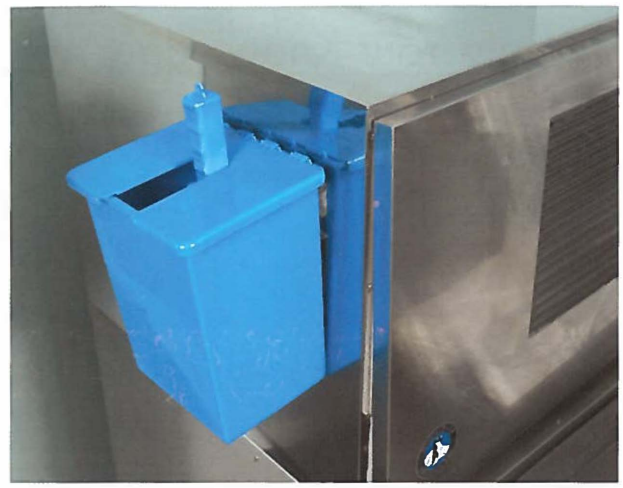
Ice

Follow these guidelines to avoid contaminating ice in your operation:

Consumption Make ice from water that is safe to drink.

Cooling food **NEVER** use ice as an ingredient if it was used to keep food cold. For example, if ice is used to cool food on a salad bar, it cannot then be used in drinks.

Containers and scoops Use clean and sanitized containers and ice scoops to transfer ice from an ice machine to other containers.



- Store ice scoops outside of the ice machine in a clean, protected location, as shown in the photo at right.
- **NEVER** hold or carry ice in containers that have held raw meat, seafood, or poultry; or chemicals.
- **NEVER** touch ice with hands or use a glass to scoop ice.

Preparation Practices That Have Special Requirements

You will need a variance when prepping food in certain ways. A **variance** is a document issued by your regulatory authority that allows a regulatory requirement to be waived or changed.

When applying for a variance, your regulatory authority may require you to submit a HACCP plan. The plan must account for any food safety risks related to the way you plan to prep the food item.

You will need a variance if your operation plans to prep food in any of the following ways:

- Packaging fresh juice on-site for sale at a later time, unless the juice has a warning label that complies with local regulations.
- Smoking food as a way to preserve it (but not to enhance flavor).
- Using food additives or adding components such as vinegar to preserve or alter the food so that it no longer needs time and temperature control for safety.
- Curing food.
- Custom-processing animals for personal use. For example, a hunter brings a deer to a restaurant for dressing and takes the meat home for later use.
- Packaging food using a reduced-oxygen packaging (ROP) method. This includes MAP, vacuum-packed, and sous vide food, as shown in the photo at right.
- Sprouting seeds or beans.
- Offering live shellfish from a display tank.

Apply Your Knowledge

What's the Problem? Decide if the food in each situation was prepped correctly. Explain why or why not.

1. **Marie needed to make 15 chef salads for lunch service in 3 hours. She got out the lettuce, meat, and cheese and left them on the prep table so that she could make the salads in between her other tasks.**

   Was the food prepped correctly? Why or why not?

   _____

   _____

2. **Krista deveined raw shrimp on a blue cutting board for the restaurant's signature shrimp scampi. Then she washed her hands, cleaned and sanitized the prep table, and then used a different knife to slice melons on a green cutting board.**

   Was the food prepped correctly? Why or why not?

   _____

   _____

3. **Jonathan filled a clean and sanitized prep sink with cold water and ice. Then he soaked a partial case of spinach that he had gotten from the cooler. Next he added a new case of spinach that was delivered that morning.**

   Was the food prepped correctly? Why or why not?

   _____

   _____

4. **Jeff wanted to test whether his customers would buy fresh juice to take home. He created a special display by the cash register to store the juice on ice. He labeled each bottle with the ingredients and use-by date.**

   Was the food prepped correctly? Why or why not?

   _____

   _____

5. **Phillip, the chef at a nursing home, wanted to treat the residents to his famous chocolate mousse. He whipped egg whites using pasteurized eggs whites with chocolate, cream, sugar, and vanilla and poured the mixture into individual serving dishes.**

   Was the food prepped correctly? Why or why not?

   _____

   _____

For answers, please turn to page 6.24.

Apply Your Knowledge

Pick the Correct Way to Prep Food Write an X next to the correct answer in each pair.

1 When using pooled eggs:

A _____ **Cook them promptly after mixing, or store them at room temperature.**

B _____ **Cook them promptly after mixing, or store them at 41°F (5°C) or lower.**

2 To thaw frozen food:

A _____ **Place the item in a prep sink with warm, running water.**

B _____ **Place the item in a cooler that keeps it at 41°F (5°C) or lower.**

3 To protect ice:

A _____ **Store ice scoops inside of the ice bin.**

B _____ **Store ice scoops outside of the machine in a clean, protected location.**

4 When storing leftover salads that contain TCS food:

A _____ **Throw out leftovers held at 41°F (5°C) or lower after 7 days.**

B _____ **Throw out leftovers held at 41°F (5°C) or lower after 10 days.**

For answers, please turn to page 6.24.

Cooking Food

The only way to reduce pathogens in food to safe levels is to cook it to its correct minimum internal temperature. This temperature is different for each food. Once reached, you must hold the food at this temperature for a specific amount of time. If customers request a lower temperature, you need to inform them of the potential risk of foodborne illness. Also be aware of special menu restrictions if you serve high-risk populations.

While cooking reduces pathogens in food, it does not destroy spores or toxins they may have produced. You still must handle food correctly before you cook it.

How to Check Temperatures

To make sure the food you are cooking has reached the correct temperature, you must know how to take the temperature correctly. Follow these guidelines.

Pick a thermometer with a probe that is the correct size for the food.

Check the temperature in the thickest part of the food.

Take at least two readings in different locations.

Cooking Requirements for Specific Food

Monitor the temperature of cooked food to make sure it has reached the correct temperature. Minimum temperatures have been developed for TCS food. Most of these foods will need to be held at the minimum temperature for a minimum amount of time. These temperatures and times are listed in Table 6.2. However, your operation or area might have different requirements. *Check your local regulatory requirements.*

Table 6.2: **Cooking Requirements for Specific Types of Food**

165°F (74°C) for 15 seconds

- Poultry—including whole or ground chicken, turkey, or duck
- Stuffing made with fish, meat, or poultry
- Stuffed meat, seafood, poultry, or pasta
- Dishes that include previously cooked TCS ingredients (raw ingredients should be cooked to their required minimum internal temperatures)

155°F (68°C) for 15 seconds

- Ground meat—including beef, pork, and other meat
- Injected meat—including brined ham and flavor-injected roasts
- Mechanically tenderized meat
- Ratites (mostly flightless birds with flat breastbones)—including ostrich and emu
- Ground seafood—including chopped or minced seafood
- Shell eggs that will be hot held for service

145°F (63°C) for 15 seconds

- Seafood—including fish, shellfish, and crustaceans
- Steaks/chops of pork, beef, veal, and lamb
- Commercially raised game
- Shell eggs that will be served immediately

145°F (63°C) for 4 minutes

- Roasts of pork, beef, veal, and lamb
- Roasts may be cooked to these alternate cooking times and temperatures depending on the type of roast and oven used:

130°F (54°C)	112 minutes	138°F (59°C)	18 minutes
131°F (55°C)	89 minutes	140°F (60°C)	12 minutes
133°F (56°C)	56 minutes	142°F (61°C)	8 minutes
135°F (57°C)	36 minutes	144°F (62°C)	5 minutes
136°F (58°C)	28 minutes		

135°F (57°C) (no minimum time)

- Fruit, vegetables, grains (e.g., rice, pasta), and legumes (e.g., beans, refried beans) that will be hot held for service

Cooking TCS Food in the Microwave Oven

Meat, seafood, poultry, and eggs that you cook in a microwave oven must be cooked to 165°F (74°C). In addition, follow these guidelines:

- Cover the food to prevent its surface from drying out.
- Rotate or stir it halfway through the cooking process so that the heat reaches the food more evenly.
- Let the covered food stand for at least two minutes after cooking to let the food temperature even out.
- Check the temperature in at least two places to make sure that the food is cooked through.

Partial Cooking during Preparation

Some operations partially cook food during prep and then finish cooking it just before service. This is called **partial cooking**, or parcooking. You must follow the steps below if you plan to partially cook meat, seafood, poultry, eggs, or dishes containing these items.

1 Do not cook the food for longer than 60 minutes during initial cooking.

2 Cool the food immediately after initial cooking.

3 Freeze or refrigerate the food after cooling it. If refrigerating the food, make sure it is held at 41°F (5°C) or lower. If the food will be refrigerated, store it away from ready-to-eat food.

4 Heat the food to its required minimum internal temperature before selling or serving it.

5 Cool the food if it will not be served immediately or held for service.

Your local regulatory authority will require you to have written procedures that explain how the food cooked by this process will be prepped and stored. These procedures must be approved by the regulatory authority and describe the following:

- How the requirements will be monitored and documented
- Which corrective actions will be taken if requirements are not met
- How these food items will be marked after initial cooking to indicate that they need further cooking
- How these food items will be separated from ready-to-eat food during storage, once initial cooking is complete

Consumer Advisories

You must cook TCS food to the required minimum internal temperatures listed in this chapter unless a customer requests otherwise. This might happen often in your operation, particularly if you serve meat, eggs, or seafood.

Disclosure If your menu includes TCS items that are raw or undercooked, such as animal products, you must note it on the menu next to these items. This can also be done by placing an asterisk next to the item that points customers to a footnote at the bottom of the menu. The footnote must include a statement that indicates the item is raw or undercooked, or contains raw or undercooked ingredients. The menu in the photo at right shows an example of disclosure.

Reminder You must advise customers who order TCS food that is raw or undercooked, such as animal products, of the increased risk of foodborne illness. You can do this by posting a notice in your menu. You can also provide this information using brochures, table tents, signs, or other written methods. The menu here also shows an example of a reminder statement below the disclosure.

Children's Menus

The Food and Drug Administration (FDA) advises against offering raw or undercooked meat, poultry, seafood, or eggs on a children's menu. This is especially true for undercooked ground beef, which may be contaminated with shiga toxin-producing *E. coli* O157:H7.

Operations That Mainly Serve High-Risk Populations

Operations that mainly serve a high-risk population, such as nursing homes or day-care centers, cannot serve certain items. **NEVER** serve these items:

- Raw seed sprouts.
- Raw or undercooked eggs (unpasteurized), meat, or seafood. Examples include over-easy eggs, raw oysters on the half shell, and rare hamburgers.
- Unpasteurized milk or juice.

Apply Your Knowledge

How Do You Check It? Place an X in the space that shows the correct way to check a temperature.

1 A _____

B _____

2 A _____

B _____

For answers, please turn to page 6.24.

Apply Your Knowledge

What's the Temperature? Identify the required minimum internal cooking temperature for each food. Write the letter in the space provided. Some letters will be used more than once.

A

B

C

D

1. _____ **Pork roast**
2. _____ **Brined ham**
3. _____ **Catfish fillets**
4. _____ **Ground-beef burger**
5. _____ **Stuffing made with oysters**
6. _____ **Roasted potatoes that will be hot held**
7. _____ **Scrambled shell eggs that will be hot held**
8. _____ **Chili made with previously cooked chicken**

For answers, please turn to page 6.24.

Cooling and Reheating Food

When you do not serve cooked food immediately, you must get it out of the temperature danger zone as quickly as possible. That means cooling it quickly. You also need to reheat it correctly, especially if you are going to hold it.

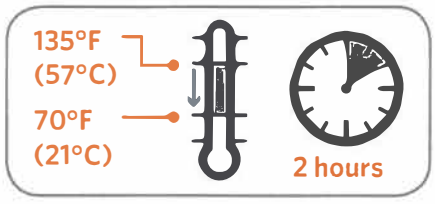
Something to Think About

Shiga toxin-producing *E. coli* is also known as STEC. A recent STEC outbreak sickened more than 100 people who ate food containing cilantro at a popular restaurant. A health inspection after the outbreak found some critical violations. These included improper hand hygiene by workers and temperature abuse of TCS foods, including some that contained the cilantro.

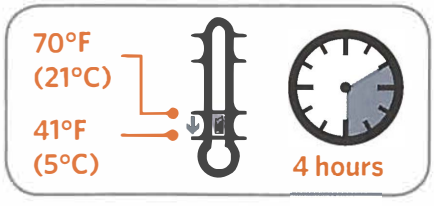
Temperature Requirements for Cooling Food

As you know, pathogens grow well in the temperature danger zone. However, they grow much faster at temperatures between 125°F and 70°F (52°C and 21°C). Food must pass through this temperature range quickly to reduce this growth.

Cool TCS food from 135°F (57°C) to 41°F (5°C) or lower within six hours.



First, cool food from 135°F to 70°F (57°C to 21°C) within two hours.



Then cool it from 70°F to 41°F (21°C to 5°C) or lower in the next four hours.

If food has not cooled to 70°F (21°C) within two hours, it must be reheated and then cooled again.

If you can cool the food from 135°F to 70°F (57°C to 21°C) in less than two hours, you can use the remaining time to cool it to 41°F (5°C) or lower. However, the total cooling time cannot be longer than six hours. For example, if you cool food from 135°F to 70°F (57°C to 21°C) in one hour, you have the remaining five hours to get the food to 41°F (5°C) or lower.

Cooling Food

Several factors and cooling methods can affect how quickly food will cool.

Factors That Affect Cooling

The following factors affect how quickly food will cool:

Thickness or density of the food The denser the food, the more slowly it will cool.

Size of the food Large food items cool more slowly than smaller items. To let food cool faster, you should reduce its size. Cut large food items into smaller pieces. Divide large containers of food into smaller containers or shallow pans, as shown in the photo at right.

Storage container Stainless steel transfers heat away from food faster than plastic. Shallow pans let the heat from food disperse faster than deep pans.

Methods for Cooling Food

NEVER cool large amounts of hot food in a cooler. Most coolers are not designed to cool large amounts of hot food quickly. Also, placing hot food in a cooler may not move the food through the temperature danger zone quickly enough. Here are some effective methods for cooling food quickly and safely:

Ice-water bath After dividing food into smaller containers, place them in a clean prep sink or large pot filled with ice water. The food handler in the photo at right is cooling a container of meat sauce this way.

Stir the food frequently to cool it faster and more evenly.

Blast chiller Blast chillers blast cold air across food at high speeds to remove heat. They are typically used to cool large amounts of food.

Ice paddle Ice paddles are plastic paddles that can be filled with ice or with water and then frozen. Food stirred with these paddles will cool quickly, as shown in the photo at left.

Food cools even faster when placed in an ice-water bath and stirred with an ice paddle.

Ice or cold water as ingredient When cooling soups or stews, the recipe is made with less water than required. Cold water or ice is then added after cooking to cool the food and provide the remaining water.

Storing Food for Further Cooling

Loosely cover food containers before storing them. Food can be left uncovered if stored in a way that prevents contaminants from getting into it. Storing uncovered containers above other food, especially raw seafood, meat, and poultry, will help prevent cross-contamination.

Reheating Food

How you reheat food depends on how you intend to use the food. Follow these guidelines when reheating food:

Food reheated for immediate service You can reheat food that will be served immediately, such as beef for a beef sandwich, to any temperature. However, you must make sure the food was cooked and cooled correctly.

Food reheated for hot holding You must heat TCS food for hot holding to an internal temperature of 165°F (74°C) for 15 seconds. Make sure the food reaches this temperature within two hours from start to finish. The food handler in the photo at left is reheating soup for hot holding. These guidelines apply to all reheating methods, such as ovens or microwave ovens.

Reheat commercially processed and packaged ready-to-eat food to an internal temperature of at least 135°F (57°C). This includes items such as cheese sticks and deep-fried vegetables.

Apply Your Knowledge

Cooling Food Write an X next to each food that has been cooled correctly.

1. _____ **Beef barley soup was cooled from 135°F to 70°F (57°C to 21°C) in one hour and then from 70°F to 41°F (21°C to 5°C) in four hours.**

2. _____ **Chili was cooled from 135°F to 70°F (57°C to 21°C) in two hours and then from 70°F to 41°F (21°C to 5°C) in four hours.**

3. _____ **Mashed potatoes were cooled from 135°F to 70°F (57°C to 21°C) in three hours and then from 70°F to 41°F (21°C to 5°C) in two hours.**

Is It Hot Enough? Decide if the food in each situation is safe to serve. Explain why or why not.

1. **At 9:00 a.m., Lin clocked in, said hello to her manager, and started to set up the buffet. Fifteen minutes later, she headed to the walk-in cooler, where she grabbed a stockpot of chili that had been made a few days earlier. She placed the stockpot on the stove and started reheating it. At 11:30 a.m., she checked the temperature of the chili, which had reached 155°F (68°C). Satisfied, she moved on to her next task.**

   Is the chili safe to serve? Why or why not?

   _____

   _____

   _____

   _____

2. **Thursday at lunch, a customer ordered a stacked hot roast beef and cheddar sandwich. Mina took precooked slices of beef from the reach-in cooler and put them in a bain of hot au jus. She heated the slices of beef for a few minutes. Then she made the sandwich, topping it with melted cheddar, and placed it on the counter for pickup.**

   Is the sandwich safe to serve? Why or why not?

   _____

   _____

   _____

   _____

For answers, please turn to page 6.25.

Chapter Summary

- Prevent cross-contamination and time-temperature abuse when preparing food. General practices include prepping food in small batches; keeping workstations, cutting boards, and utensils clean and sanitized; only removing as much food from the cooler as you can prep in a short period; returning prepped food that is not going to be cooked immediately back to the cooler; following guidelines for the use of additives; and thawing food correctly. Follow additional guidelines for prepping produce, eggs, and salads containing TCS food; when handling ice; and when using preparation practices that require a variance.
- Throw away food when it has become unsafe and cannot be safely reconditioned. Also throw it away if it has not been presented honestly.
- Thaw frozen food in the cooler, under running water, in a microwave oven, or as part of the cooking process. Never thaw food at room temperature.
- Cook and reheat food to required minimum internal temperatures for a specific amount of time. Cooking temperatures and times vary from food to food. Reheat TCS food that will be hot held to an internal temperature of 165°F (74°C) for 15 seconds. Make sure the reheated food reaches this temperature within two hours.
- Your menu must tell customers when a TCS food is served raw or undercooked. You must also advise customers who order food that is raw or undercooked of the increased risk of foodborne illness. You can do this in different ways. The FDA advises against offering raw and undercooked food on children's menus. Operations that mainly serve high-risk populations should never serve raw seed sprouts; raw or undercooked eggs, meat, or seafood; or unpasteurized milk or juice.
- TCS food must be cooled from 135°F to 70°F (57°C to 21°C) within two hours. Then it must be cooled from 70°F to 41°F (21°C to 5°C) or lower in the next four hours.
- Food will cool faster if you reduce its size. Cut large food items into smaller pieces. Divide large containers of food into smaller ones. Use an ice-water bath, stir food with ice paddles, or use a blast or tumble chiller to cool food safely.

Chapter Review Case Study

You can avoid foodborne-illness outbreaks in your operation if you prepare food safely. Doing this includes following general practices for thawing and prepping food; cooking food thoroughly; and cooling and reheating food correctly.

Now, take what you have learned in this chapter and apply it to the following case study.

Amanda had a busy day ahead of her at the company cafeteria. Looking in the freezer, she realized that she had forgotten to thaw the chicken breasts she had planned to serve for lunch. Moving quickly, she placed the frozen chicken in a prep sink and turned on the hot water. While waiting for the chicken to thaw, she grabbed a pan of leftover clam chowder from the cooler and placed it in the steam table to heat up.

When the lunch hour ended at 1:30 p.m., Amanda had a lot of cooked chicken breasts leftover. "No problem," Amanda thought. "We can use the leftover chicken to make chicken salad." Amanda left the still-hot chicken breasts in a pan on the prep table while she started putting other food away and cleaning up.

At 9:45 p.m., when everything else was clean, Amanda put her hand over the pan of chicken breasts and decided they were cool enough to be put away. She covered the pan with plastic wrap and put it in the cooler.

1 What did Amanda do wrong?

2 What should Amanda have done differently?

For answers, please turn to page 6.25.

Study Questions

Circle the best answer to each question.

1 **Why must prep tables be cleaned and sanitized between uses?**

A To make space to work safely
B To prevent cross-contamination
C To reduce toxic-metal poisoning
D To avoid time-temperature abuse

2 **What should happen to food right after it is thawed in a microwave oven?**

A Freeze it solid.
B Cool it to 41°F (5°C).
C Cook it in conventional cooking equipment.
D Hold it in equipment that maintains the correct temperature.

3 **When cooling TCS food, the temperature must go from 135°F to 70°F (57°C to 21°C) in**

A 2 hours.
B 4 hours.
C 6 hours.
D 8 hours.

4 **A food handler left a hotel pan of pasta salad on the prep table while preparing several lunch orders. What is the problem with this situation?**

A Cross-contamination
B Poor personal hygiene
C Time-temperature abuse
D Poor cleaning and sanitizing

5 **What is the maximum water temperature allowed when thawing food under running water?**

A 41°F (5°C)
B 60°F (16°C)
C 70°F (21°C)
D 135°F (57°C)

Study Questions

6 What is the required minimum internal cooking temperature for ground turkey?

A 135°F (57°C) for 15 seconds
B 145°F (63°C) for 15 seconds
C 155°F (68°C) for 15 seconds
D 165°F (74°C) for 15 seconds

7 A safe way to cool a stockpot of meat sauce is to put it into a

A cooler.
B freezer.
C sink of ice water.
D cold-holding unit.

8 Which food item should not be served to high-risk populations?

A Vegetable stir-fry
B Grilled salmon
C Roasted chicken
D Raw oysters

9 To what temperature must soup that contains cooked beef be reheated for hot holding?

A 135°F (57°C) for 15 seconds
B 145°F (63°C) for 15 seconds
C 155°F (68°C) for 15 seconds
D 165°F (74°C) for 15 seconds

10 When partially cooking food for later service, what is the maximum amount of time that the food can be heated during the initial cooking step?

A 60 minutes
B 70 minutes
C 80 minutes
D 90 minutes

For answers, please turn to page 6.25.

Answers

6.8 What's the Problem?

1 No. The lettuce, meat, and cheese are being time-temperature abused. She should take out of the cooler only what she can use within a short amount of time.

2 Yes. She used separate equipment for the shrimp and the produce.

3 No. One batch of spinach could cross-contaminate the other. Between batches, he should have emptied the sink, cleaned and sanitized it, and changed the ice water.

4 No. He should have either gotten a variance from his local regulatory authority before selling the juice without a warning label or included warning labels on the juice.

5 Yes. He used pasteurized eggs because raw shell eggs and undercooked, unpasteurized shell eggs cannot be served in a nursing home.

6.9 Pick the Correct Way to Prep Food

1 B

2 B

3 B

4 A

6.14 How Do You Check It?

1 A

2 A

6.15 What's the Temperature?

1 B

2 C

3 B

4 C

5 D

6 A

7 C

8 D

Answers

6.19 Cooling Food

1 and 2 should be marked.

6.19 Is It Hot Enough?

1 No. The chili did not reach an internal temperature of 165°F (74°C) within two hours.

2 Yes. Assuming the roast beef was cooked and cooled correctly, it can be reheated to any temperature because it is being served immediately.

6.21 Chapter Review Case Study

1 Here is what Amanda did wrong:

- She thawed the chicken breasts the wrong way. She should not have thawed them under hot water.
- She cooled the leftover chicken breasts the wrong way. She should not have left them out to cool at room temperature.
- She did not make sure that the clam chowder reached at least 165°F (75°C) for 15 seconds.

2 Here is what Amanda should have done differently:

- If Amanda needed to thaw the chicken breasts quickly, she should have either used a microwave or placed them under running water at 70°F (21°C) or lower.
- Amanda should have ensured the clam chowder was heated to at least 165°F (75°C) for 15 seconds before moving it to the steam table.
- To cool the chicken breasts, she could have used a blast chiller or placed the container of chicken breasts in an ice-water bath. Then she could move them to the cooler.

6.22 Study Questions

1 B
2 C
3 A
4 C
5 C
6 D
7 C
8 D
9 D
10 A