

<b>TOOL BOX</b> <b>KEEPING TEMPERATURE UNDER CONTROL</b>
---

### Event Supply Checklist

- Refrigerator thermometer
- Food thermometer (thermistor or thermocouple recommended)
- Alcohol wipes
- Temperature record logs
- Planning Guide
- (if allowed, appropriate containers for cooling hot foods)

### Introduction:

Keeping track of food temperatures is essential to the safety of your food product. Bacteria and other microorganisms are more likely to grow and multiply in a potentially hazardous food if the food is in the **Temperature Danger Zone**. The **Temperature Danger Zone** ranges from 41°F to 140°F. Cold foods should be held or stored below 41°F, while hot foods should be held and stored at 140°F or higher. Foods should be cooked to the appropriate end cooking temperature for each food.

### Objectives:

Participants will be able to:

1. Use a variety of foodservice thermometers
2. Keep food temperatures under control when purchasing, receiving, storing, preparing, cooking, cooling, reheating, and holding food.

### Teaching Aids

- Planning Guide
- A variety of thermometers: refrigerator, oven, and food (thermistor, bi-metallic, thermocouple if available)
- Alcohol wipes for sanitizing
- Variety of containers suitable for cooling hot food including shallow pans/dishes, small plastic containers with covers

### Activities- Part A-Using a Food Thermometer

1. **Show** a variety of thermometers and discuss appropriate use of each.
2. **Demonstrate** how to calibrate, wash, sanitize and use a food thermometer.
  - **Refrigerator/freezer thermometers:** Place a thermometer on the top shelf of the refrigerator/freezer near to the door. This is the warmest part of the refrigerator/ freezer. Check the temperature at least twice daily. If coolers are being used, keep a thermometer in the cooler and monitor it at least every 4 hours.
  - **Oven thermometers:** An oven thermometer will help you to know if your oven is working properly. Do not use it as a measure of doneness of food cooked in the oven.
    - **Bimetallic oven thermometer** (glass face for use in oven): Reads in 1-2 minutes, place **2-2 1/2"** deep in thickest part of food. Can be used in roasts, casseroles, and soups. Not appropriate for thin foods. Heat

- conduction of metal stem can cause false high reading. Some models can be calibrated; check manufacturer's instructions
- **Bimetallic food thermometer** (plastic face for use outside of oven): Reads in 15-20 seconds, place **2-2 1/2"** deep in thickest part of food. Can be used in roasts, casseroles, and soups. Temperature is averaged along probe, from tip to 2-3" up the stem. Not designed to remain in food while it is cooking, use to check the internal temperature of a food at the end of cooking time. Not appropriate for thin foods. Some models can be calibrated; check manufacturer's instructions
  - **Thermistor, Digital Instant-Read:** Reads in 10 seconds, place at least **1/2"** deep. Can measure temperature in thin and thick foods. Not designed to remain in food while it's cooking. Check internal temperature of food near the end of cooking time. Some models can be calibrated; check manufacturer's instructions
  - **Thermocouple:** Reads in 2-5 seconds, place 1/4" or deeper, as needed. Good for measuring temperatures of thick and thin foods. Not designed to remain in food while it's cooking. Check internal temperature of food near the end of cooking time. Can be calibrated. These can be expensive.

### Discussion Points

- Discuss what the relationship is between temperature and food safety. Explain the **Danger Zone** concept and why food must be kept either hot or cold. Food that remains in the temperature danger zone for more than four hours is at risk for supporting the growth of foodborne illness causing microorganisms. The four hours is cumulative and includes preparation, cooking, cooling and reheating. The four hours rule does not imply permission to keep all food out of temperature control for 4 hours. You should always try to minimize this time and be aware of conditions that might influence it (a very hot day).
- Discuss why temperature control is critical from the time the food is purchased until it reaches the final customer. It is important to keep track of temperatures during:
  - Purchasing (are foods in grocery store cold, do frozen foods show any sign of freezing/thawing, are eggs properly stored?)
  - Transportation (Use refrigerated transportation or store in coolers)
  - Receiving (take temperatures of all potentially hazardous foods at delivery)
  - Storage (Use refrigerator and freezer thermometers, monitor at least twice daily)
  - Preparation (Limit the time food spends in the Danger Zone during preparation; prepare large amounts of food in batches)
  - Cooking (Cook meat, fish, poultry, eggs, leftovers to recommended end cooking temperatures)
  - Cooling (Cool foods quickly—to 70°F within 4 hours and 41°F within 6 hours)
  - Holding (Hold hot foods at 140°F or higher and cold foods at 41°F or lower)

- Discuss final cooking temperatures for potentially hazardous foods. (*Find these in the Planning Guide*) How can you tell if food is thoroughly and completely cooked? The appearance of a food can give you some indication of doneness, but only by taking a temperature can you be sure that the food has reached a safe end-cooking temperature.

### **Activities- Part B- Cooling (Optional, if allowed in your operation)**

According to the 2000 FDA Pre-Operational Guide for Temporary Food Establishments, cooling potentially hazardous foods at temporary food establishments is not recommended. However, if food is prepared in a permanent licensed facility, it may be cooked, cooled and brought to the temporary site for reheating and serving.

1. Demonstrate how to properly chill hot food, using sample containers.

### **Discussion Points**

- Hot food must be cooled from 140°F to 70°F in 2 hours and to 41°F in an additional 4 hours. It is important to reduce the temperature as quickly as possible. Given all the “right conditions”- (see Micro 101 Toolbox) and warm temperature, harmful disease-causing bacteria will multiply very rapidly. Discuss feasibility of safe cooling in a temporary foodservice setting.
- Safe reheating. Food must be reheated within one hour to at least 165°F for 15 seconds. If the temperature of the hot food falls below 140°F, it may be reheated once to 165°F for 15 seconds. Food may be reheated only once. If it cools to below 140°F again, it must be thrown out.
- If cooked potentially hazardous food is delivered to the site cold, it must be reheated to at least 165°F within one hour. If it is held for an extended period of time, the temperature of the food should be monitored and records kept. If the temperature falls below 140°F, the food must be reheated to 165°F. This should occur only once. Remember, the food may be in the Danger Zone for no more than 4 hours and this time is cumulative from the time the food is purchased/received to the time it is served.

**Additional Resources:**

USDA Thermy materials – food thermometers

<http://www.fsis.usda.gov/oa/thermy/ktherms.htm>

**Credits**

1. Temperature Danger Zone, The Food Safety Training Pack- Manager, Employee and Refresher Training, Chartered Institute of Environmental Health, London, England, 2000 p 37.
2. Cool It Quickly “Keeping Kids SAFE- “A Guide for Safe Food Handling for Childcare Providers”, USDA, 1998.
3. Cool Down Fast “Safe Food Handler Training Kit”, Louisiana State University Agricultural Center, Louisiana State University, 1996

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1940, in cooperation with the U.S. Department of Agriculture, Kirklyn M. Kerr, Director, Cooperative Extension System, University of Connecticut, Storrs. An equal opportunity program provider and employer. To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, Stop code 9410, 1400 Independence Avenue, SW, Washington, DC 20250-9410 or call 202.720.5964.



