

Policy & Procedure Manual

Resource: Taking Accurate Temperatures

Choosing the Right Thermometer

Start with an accurately calibrated thermometer that is in good working condition. There are many types of thermometers available. Check state regulations for more specific guidelines.

For general use, the bimetallic thermometer is a cost efficient tool and if used correctly can provide accurate temperatures. When using the bimetallic stem thermometer, remember that the sensor on the probe is 1 to 2" above the tip. This area must be submerged into the food for several seconds to achieve an accurate temperature. Other types of thermometers available include: the digital thermistor thermometer, thermocouple technology and the digital thermocouple thermometer. Infrared thermometers are also available but they are generally not used in health care kitchens.

- The digital thermistor is usually battery powered, takes only a few seconds to register the temperature, and the sensor is near the tip of the probe.
- The thermocouple has two wires of dissimilar metals joined together at both ends. When one end is heated, the difference that is generated is proportional to the junction of temperature. Their small size makes them very sensitive to temperature fluctuations.
- The digital thermocouple thermometer gives the quickest temperature response, has the widest temperature range, and is easy to calibrate..
- Data collection thermometers are handheld instruments that can store up to 2000 entries. They download data to a PC, sort and graph temperature reports.

Calibrating the Thermometer

For all thermometers, follow the manufacturers' directions for calibration.

Bimetallic Thermometers

There are two ways to calibrate a bimetallic thermometer: the ice point method and the boiling point method. Thermometers should be calibrated at least monthly.

Ice Point

1. Start with a container large enough to easily accommodate your thermometer. Fill it with ice (crushed is best). Add tap water to fill and stir. Allow ice water mixture to cool for a few minutes.
2. Put the thermometer probe into the ice water mixture. It is important to wait about 30 seconds without having the probe touch the sides or bottom of the container. Be sure the temperature indicator is no longer moving.
3. Look for the nut on the underside of the thermometer, use a wrench* and turn the head of the thermometer until the reading on the face of the dial reads 32° F (0° C).

Boiling Point

1. In a fairly deep pan, bring tap water to a boil.
2. Place the probe of the thermometer carefully into the boiling water so the sensor on the stem is completely submerged without touching the sides or bottom of the pan.
3. Wait about 30 seconds or until the temperature on the face of the dial stops moving.

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4. Again, look for the nut on the underside of the thermometer and use a wrench* and turn the head of the thermometer until the temperature reads 212° F (100° C) or at the boiling point for your elevation.

**Some bimetallic thermometers have a “wrench” tool attached to the case or sheath.*

Taking Accurate Temperatures using Metal Stem Thermometers

1. To take temperatures, a clean, rinsed, sanitized and air-dried thermometer that is the metal stem type, numerically scaled and accurate to plus or minus 2° F is needed. Should this thermometer have a tube type cover, it must also be sanitized as indicated for the thermometer. A temperature record for recording the temperatures is also needed. Choose the proper thermometer for the food to be monitored. (Thin foods will require a different thermometer than thick foods.)
2. To take hot food temperatures, insert the thermometer at a 45-degree angle to the middle of the food item, taking care not to touch the container or bone if applicable. Wait for the thermometer to rise to the maximum temperature, read and record the temperature and then remove the thermometer from the food item and immediately clean and sanitize. Repeat these guidelines until all hot food temperatures have been taken.
 - Normally, hot foods will be 165° to 180° F or higher when removed from the cooking heat source. Assure a high enough holding temperature to maintain a temperature at or above 135° F during holding, distribution and service
3. To take cold food temperatures, insert the thermometer at a 45-degree angle to the middle of the food item using care not to touch the container. Wait for the thermometer to drop to the minimum temperature, read and record the temperature and then remove the thermometer from the food item and immediately clean and sanitize. Repeat this guideline until all cold food temperatures have been taken. The thermometer must be sanitized between uses in different foods.**
4. Temperatures should be taken periodically to assure hot foods stay above 135° F and cold foods stay below 41° F during the portioning, transporting and serving process until received by the customer.
 - Maintain a cold enough holding temperature to assure sure foods are maintained at or below 41° F until served
 - Frozen items such as ice cream and sherbet should be held at a low enough temperature to maintain their frozen state until service, at which time they should remain in a solid state with little melting

***Thermometers should be sanitized according to manufacturer’s instructions. Bimetallic thermometers may be sanitized using a dish machine or three sink method. In between uses at one meal, an alcohol swab may be used to sanitize. (Use a new swab for each sanitizing.)*

For more information on thermometers, visit the USDA Food Safety and Inspection Service website: Types of Food Thermometers: Choose the One that is Right for You! http://www.fsis.usda.gov/wps/portal/fsis/topics/food-safety-education/teach-others/fsis-educational-campaigns/thermy/types-of-food-thermometers/CT_Index. February 10, 2016.

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Resource: Minimum Cooking, Holding and Reheating Temperatures

Cooking is a critical control point in preventing food borne illness. Cooking to heat all parts of food to the temperature and for the specified time below will either kill dangerous organisms or inactivate them sufficiently so that there is little risk to the individual if the food is eaten promptly after cooking. Monitoring the food's internal temperature for 15 seconds determines when microorganisms can no longer survive and food is safe for consumption. Foods should reach the following internal temperatures.

Summary Chart for Minimum Cooking Food Temperatures and Holding Times

Food	Minimum Temperature	Minimum Holding Time at the Specified Temperature
Raw Eggs prepared for immediate service Commercially Raised Game Animals and Exotic Species of Game Animals Fish, Pork, and Meat not otherwise specified in this chart or in 3-401.11 (B)	145° F (63° C)	15 seconds
Raw Eggs not prepared for immediate service Comminuted Commercially Raised Game Animals and Exotic Species of Game Animals Comminuted Fish and Meats Injected meats Mechanically Tenderized Meets	158° F (63° C) 155° F (68° C) 150° F (66° C) 145° F (63° C)	<1 second 15 seconds 1 minute 3 minutes
Poultry Baluts Stuffed Fish; Stuffed meat; Stuffed Pasta; Stuffed Poultry; Stuffed Ratites Stuffing Containing fish, Meat, Poultry, or Ratites Wild Game Animals	145° F (63° C)	15 seconds
Food Cooked in a Microwave Oven	165° F (74° C)	And hold for 2 minutes after removing from microwave oven

Source: Food Code 2013, U.S. Department of Health and Human Services, U.S. Public Health Service, Food and Drug Administration, College Park, MD 20740. 3-401, pages 80-84. Available at

<http://www.fda.gov/downloads/Food/GuidanceRegulation/RetailFoodProtection/FoodCode/UCM374510.pdf>. Accessed February 11, 2016.

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Summary Chart for Minimum Food Temperatures and Holding Times for Reheating Foods for Hot Holding

Food	Minimum Temperature	Minimum Holding Time at the Specified Temperature	Maximum Time to Reach Minimum Temperature
3-403.11(A) and (D) Food that is cooked, cooled, and reheated	165° F (74° C)	15 seconds	2 hours
3-403.11(B) and (D) Food that is reheated in a microwave oven	165° F (74° C)	and hold for 2 minutes after reheating	2 hours
3-403.11(C) and (D) Food that is taken from a commercially processed, hermetically sealed container or intact package	135° F (57° C)	No time specified	2 hours
Roasts: Option A 3-403.11(E) Unsliced portions of meat roasts cooked as specified under 3-401.11(B)	Same oven parameters and minimum time and temperature conditions as specified under 3-401.11(B)	Same oven parameters and minimum time and temperature conditions as specified under 3-401.11(B)	Not applicable
Roasts: Option B 3-403.11(E) Unsliced portions of meat roasts cooked as specified under 3-401.11(B)	165° F (74° C)	15 seconds	2 hours

Note: Do NOT use the steam table to reheat food (food cannot reach the proper temperature within acceptable time frames).

Source: Food Code 2013, U.S. Department of Health and Human Services, U.S. Public Health Service, Food and Drug Administration, College Park, MD 20740. 3-403.11, page 87. Available at <http://www.fda.gov/downloads/Food/GuidanceRegulation/RetailFoodProtection/FoodCode/UCM374510.pdf>. Accessed February 11, 2016.

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Sample Food Temperatures Form

Week of: _____

Record food temperature PRIOR to service, and AGAIN after half of the meal has been served.

Breakfast	Sunday		Monday		Tuesday		Wednesday		Thursday		Friday		Saturday	
Eggs														
Hot cereal														
Entrée														
Pureed Hot Item														
Pureed Cold Item														
Juice														
Milk														
Initial														

Lunch	Sunday		Monday		Tuesday		Wednesday		Thursday		Friday		Saturday	
Entrée														
Alternate														
Potato/Starch														
Vegetable														
Soup														
Mech Soft Meat														
Pureed Meat														
Pureed Vegetable														
Cold Fruit														
Dessert														
Pureed Cold Item														
Milk														
Initial														

Dinner	Sunday		Monday		Tuesday		Wednesday		Thursday		Friday		Saturday	
Entrée														
Alternate														
Potato/Starch														
Vegetable														
Soup														
Mech Soft Meat														
Pureed Meat														
Pureed Vegetable														
Cold Fruit														
Dessert														
Pureed Cold Item														
Milk														
Initial														

Hot foods should be $\geq 165^{\circ}$ F prior to tray line and $\geq 135^{\circ}$ F through end of tray line. Cold foods must be maintained at $\leq 41^{\circ}$ F. **Report any foods that are in the temperature danger zone of $>41^{\circ}$ F to $<135^{\circ}$ F to the supervisor immediately for corrective action.**

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Sample CCP Documentation Form

- Temperature and time during various points of preparation (including cooling) and service. (A. beginning temperature, B. during preparation, C. finished product).
- Temperature during service.

Critical Control Point (CCP)			1 Temperature/Time			2 Temp. ° F	Actions to Resolve Problem Temperatures
Date	Meal	Food Item	A	B	C		

CCP Items Any foods containing the following:

Dairy products (milk, cheese, sour cream, cream cheese, etc.)	Sliced melon
Meat, fish or poultry	Baked or boiled potatoes
Eggs	Raw seeds and sprouts
Protein (including tofu)	Beans that have been heat treated

Report to the supervisor any foods that do not cool to 135° F to 70° F within 2 hours and from 70° F to 41° F within another 4 hours.