



Appliance Thermometers

One of the critical factors in controlling bacteria in food is controlling temperature. Pathogenic microorganisms grow very slowly at temperatures below 40 °F, multiply rapidly between 40 and 140 °F, and are destroyed at temperatures above 140 °F. For safety, foods must be held at proper cold temperatures in refrigerators or freezers and they must be cooked thoroughly. But how would a consumer know if the refrigerator was cold enough, or if the oven was heating at the proper temperature?

Appliance thermometers are specially designed to measure the temperature of the air in either the refrigerator/freezer or the oven. Some refrigerator thermometers have long metal probes and are similar in appearance to food thermometers. Other refrigerator thermometers, and most oven thermometers, are designed to hang from a wire rack or sit on a shelf.

Whether they measure the temperature in the oven or refrigerator/freezer, most appliance thermometers are either liquid-filled or bimetallic-coil thermometers:

- **Liquid-filled Thermometers**, also called “spirit-filled” or “liquid in glass” thermometers, are the oldest types of thermometers used in home kitchens. As the temperature increases, the colored liquid (usually an alcohol solution) inside the thermometer expands and rises to indicate the temperature on a scale.
- **Bimetallic-coil Thermometers** contain a coil made of two different metals with different rates of expansion that are bonded together. The bimetal element is coiled, fixed at one end, and attached to a pointer stem at the other end. As the temperature increases, the pointer will be rotated by the coiled bimetal element to indicate the temperature.



Using Appliance Thermometers

Refrigerator/Freezer Thermometers

Refrigerator/freezer thermometers are specially designed to provide accuracy at cold temperatures.

For safety, it is important to verify the temperature of refrigerators and freezers. Refrigerators should maintain a temperature no higher than 40 °F. Frozen food will hold its top quality for the longest possible time when the freezer maintains 0 °F.

Most refrigerators and freezers can be easily adjusted to run colder or warmer. The temperature control is usually accessible in the refrigerator part of the appliance. Check the owner’s manual for specific details on adjusting the temperature. An adjustment period is often required when changing the temperature.

To measure the temperature in the refrigerator:

Put the thermometer in a glass of water and place in the middle of the refrigerator. Wait 5 to 8 hours. If the temperature is not 38 to 40 °F, adjust the refrigerator temperature control. Check again after 5 to 8 hours.

To measure the temperature in the freezer:

Place the thermometer between frozen food packages. Wait 5 to 8 hours. If the temperature is not 0 to 2 °F, adjust the freezer temperature control. Check again after 5 to 8 hours.

An appliance thermometer can be kept in the refrigerator and freezer to monitor the temperature

Appliance Thermometers

at all times. This can be critical in the event of a power outage. When the power goes back on, if the refrigerator is still 40 °F and the freezer is 0 °F or below, the food is safe.

Oven Thermometers

An oven thermometer can be left in the oven to verify that the oven is heating to the desired temperatures. When cooking meat and poultry, it is important that the oven be set at 325 °F or higher. These thermometers can measure temperatures from 100 to 600 °F.



To check the accuracy of an oven, hang the oven thermometer from a rack in the center of the oven (you may have to adjust the oven racks). Set the oven for 325 to 350 °F and allow it to preheat. Once the oven has reached the set temperature, open the oven door and read the thermometer. The oven maintains its temperature by cycling on and off, especially if the door has been opened. Check the temperature again after 5 minutes.

If the oven is not maintaining the set temperature, the oven thermostat will have to be adjusted by a service center representative authorized by the manufacturer. However, if, after testing the oven temperature at several settings (325, 350, 375, and 400 °F), it is consistently high or low by the same amount (say, 25 °F), this can be factored into the temperature setting. For example, if you know that your oven runs "hot" by 25 °F and you need to bake something at 350 °F, set the oven for 325 °F. Always check the oven thermometer to verify the temperature.

Microwave Oven Probes

A microwave oven probe can be plugged into the microwave and inserted in the food being cooked. Some microwaves can be programmed to cook the food until a desired temperature is reached. Check the owner's manual for more information. Some thermometers are specially designed to be used in the microwave oven, but most food thermometers are not microwave-safe. Check the packaging instructions for more information.

Food Safety Questions?

Call the USDA Meat & Poultry Hotline

If you have a question about meat, poultry, or egg products, call the USDA Meat and Poultry Hotline toll free at **1-888-MPHotline (1-888-674-6854)**; TTY: 1-800-256-7072.



The Hotline is open year-round Monday through Friday from 10 a.m. to 4 p.m. ET (English or Spanish). Recorded food safety messages are available 24 hours a day. Check out the FSIS Web site at www.fsis.usda.gov.

Send E-mail questions to MPHotline.fsis@usda.gov.

Ask Karen!

FSIS' automated response system can provide food safety information 24/7



AskKaren.gov