Food thermometers: Types and calibration

Digital types			
Types	**Speed**	**Placement**	**Usage considerations**
Thermocouple	2 to 5 seconds	1 cm or deeper in the food, as needed	• Gives fastest reading • 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 • More costly; may be difficult for consumers to find in stores
Thermistor	10 seconds	At least 1.5 cm deep in the food	• Gives a fast reading • 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 • Available in kitchen stores

Digital types			
Types	**Speed**	**Placement**	**Usage considerations**
Thermometer fork combination	2 to 10 seconds	5 to 7 cm deep in the thickest part of the food	• Can be used in most foods • Not designed to remain in food while it is cooking • Sensor in tine of fork must be fully inserted • Check internal temperature of food near the end of cooking time • Cannot be calibrated • Convenient for grilling
Infrared thermometer	Quick read; follow manufacturer's instructions for adequate timing	Non-contact; follow manufacturer's instructions for distance	• Convenient for checking holding temperatures of serving areas, buffets, warming trays, and cold storage areas (refrigerators and freezers) • Used to measure surface temperature; may not be accurate for reading internal temperatures or for measuring doneness of foods

Dial types			
Types	**Speed**	**Placement**	**Usage considerations**
Oven-safe, bimetal	1 to 2 minutes	5 to 7 cm deep in the thickest part of the food	• Can be used in roasts, casseroles, and soups • Not for use with thin foods • Can remain in food while it is cooking • Heat conduction of metal stem can cause false high reading • Some models can be calibrated; check manufacturer's instructions
Instant-read, bimetal	15 to 20 seconds	5 to 7 cm deep in the thickest part of the food	• Can be used in roasts, casseroles, and soups • Temperature is averaged along probe, from tip to 5–8 cm up the stem • Cannot measure thin foods unless inserted sideways • 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 • Some models can be calibrated; check manufacturer's instructions • Readily available in stores

Calibrating a thermometer

There are two ways to check the accuracy of a food thermometer: using ice water or boiling water. Many food thermometers have a calibration nut under the dial that can be adjusted. Check the package for instructions.

Even if the food thermometer cannot be calibrated, it should still be checked for accuracy using either the ice water or boiling water method.

Ice water

To use the ice water method, fill a large glass with finely crushed ice. Add clean tap water to the top of the ice and stir well. Immerse the food thermometer stem a minimum of 5 cm into the mixture, touching neither the sides nor the bottom of the glass. Wait a minimum of 30 seconds before adjusting.

Without removing the stem from the ice, hold the adjusting nut under the head of the thermometer with a suitable tool, and turn the head so the pointer reads 0°C (32°F).

Boiling water

To use the boiling water method, bring a pot of clean tap water to a full rolling boil. Immerse the stem of the food thermometer in the water to a minimum of 5 cm. Wait at least 30 seconds. (For ease in handling, the stem of the food thermometer can be placed through the clip section of the stem sheath and, holding the sheath horizontally, lowered into the boiling water.)

Without removing the stem from the pan, hold the adjusting nut under the head of the thermometer with a suitable tool, and turn the head so the thermometer reads 100°C (212°F).

For true accuracy, distilled water must be used, and the atmospheric pressure must be one atmosphere (76 cm of mercury). Tap water measured in unknown atmospheric conditions would probably not boil at 100°C (212°F). Most likely, it would boil as much as 3°C (5°F) lower. Remember, water boils at a lower temperature in a high-altitude area, so it’s best to add a couple of degrees for a margin of safety.

Inaccurate readings

You can replace an inaccurate food thermometer, or take any inaccuracies into consideration when using it. For example, water boils at 100°C (212°F). If the food thermometer reads 101°C (214°F) in boiling water, it’s reading one degree too high. I this case, you must subtract one degree from the temperature displayed when taking a reading in food to find out the true temperature.

In another example, ground beef patties must reach 74°C (165°F) for safety. If the thermometer is reading one degree too high, you must add one degree to the desired temperature, so hamburger patties must be cooked to 75°C (167°F).