



# Purchasing Thermometers

## Lesson Objectives

1. Determine thermometer needs for each school kitchen or food production facility.
2. Develop and use specifications to purchase and evaluate thermometers.

## Getting Ready

### Materials

- VCR and monitor
- Videotape, *Your Guide to Thermometers in Foodservice*
- Thermometer Toolkit
- Copies of Handouts 2 and 3 for each participant (pages 27 and 28)
- Flip chart
- Marking pens
- Several new thermometers of various types in original packaging or pictures of thermometers

### Note to Trainer

All employees may not need both lesson components. The trainer can select sections most appropriate for individuals being trained. Ask participants to take a physical inventory of thermometers in their individual school or food production facility prior to teaching Lesson 2. This will facilitate completion of Handout 2 during class.

### Lesson Format

Lesson 2 can be taught as one lesson or as two shorter lessons. If all material and activities in the lesson are covered, the lesson will take about 45 minutes. If time is limited, the lesson could be divided into smaller units. Possible divisions for shorter lessons:

Determining Thermometer Needs, Key Point 1 .....	25 minutes
Developing Thermometer Specifications, Key Point 2.....	20 minutes

## Lesson Content



## Determining Thermometer Needs

### Key Point

1

**Determining thermometer needs is an important step in maintaining safe food in school foodservice operations.**

*Estimated time: 25 minutes*

The appropriate use of thermometers helps to assure safe foods. Each school kitchen or food production facility should have thermometers readily available for use at each step in the food flow process—from receiving through service. A safe food environment is one that encourages staff to use thermometers regularly, and to be aware of the types and numbers of thermometers needed in their facility and how to obtain new thermometers.

**Review** thermometer types and uses (conduct activity and see *Thermometer Types and Uses* chart on the next page).



### ACTIVITY IDEA

Take out each type of thermometer from the Thermometer Toolkit or use thermometer pictures. Individually, hold them up and ask participants to identify the type of thermometer and its intended use. As applicable, review the temperature range for each thermometer.

### ALTERNATE ACTIVITY IDEA

If you did not show this in Lesson I, show the first segment of the videotape, *Your Guide to Thermometers in Foodservice*, that highlights thermometer types and uses.

## Thermometer Types and Uses

Thermometer Type	Uses
<b>Storage/Appliance</b> <ul style="list-style-type: none"> <li>• Refrigerator/Cooler</li> <li>• Freezer</li> <li>• Storeroom</li> </ul>	<p>Used to check internal temperature of refrigerators and coolers—range of -40 °F to 80 °F.</p> <p>Used to check internal temperature of freezers—range of -40 °F to 80 °F.</p> <p>Used to check the temperature of storerooms—range of -60 °F to 120 °F.</p>
<b>Bimetallic Stemmed</b>	Used to check the internal temperature of food—range of 0 °F to 220 °F.
<b>Meat (Bimetallic Stemmed)</b>	Used to check the internal temperature of meats during cooking—range of 130 °F to 190 °F.
<b>Digital Stemmed (Thermistor)</b>	Used to check the internal temperature of food—range of 0 °F to 220 °F.
<b>Thermocouple (Digital)</b>	Used to check a variety of temperatures with probes to measure the temperature of liquids (immersion probe), internal temperature of food (penetration probe), or surface temperatures (surface probe).
<b>Infrared</b>	Used to quickly take surface temperatures of foods during receiving, storing, and holding from up to 4 feet away.
<b>Equipment</b> <ul style="list-style-type: none"> <li>• Oven</li> <li>• Hot Holding</li> </ul>	<p>Used to check the internal temperature of ovens—range of 150 °F to 600 °F.</p> <p>Used to check the internal temperature of hot holding cabinets—range of 100 °F to 175 °F.</p>
<b>Single Use Temperature Indicators—T-Sticks® and adhesive thermometers</b>	Used for foods, and to test the temperature of water in high-temperature dish machines.

**Note:** For refrigerators, coolers, and freezers, generally there is a built-in thermometer that cannot be calibrated and may not be accurate. It is recommended that a portable thermometer be placed in units to verify the temperature.

It is important to plan for the number of each type of thermometer needed for each kitchen and/or food production facility. A simple first step is to take a physical inventory of working thermometers currently available for use in each facility (Use Handout 2).

The number of thermometers needed in a facility depends on the size of the facility, the number of employees working in the facility, and the number and type of the menu items. The number of serving lines also impact the number of thermometers required. Generally, a good rule of thumb would be to have

1.5 thermometers for each employee in preparation, holding, and serving areas. That will provide each employee with a thermometer and will provide a small number of thermometers to replace those that are damaged or do not keep calibration. Plan to have a back-up thermometer for storage areas. Refrigerator, cooler, and freezer thermometers often get bumped, damaged, and lost.



#### ACTIVITY IDEA

Ask participants to work in small groups—ideally composed of participants from the same school or food production facility. Have them project the number of thermometers needed for their facility. The projected number of thermometers may be recorded in the “Quantity Needed” column of Handout 2 *Thermometer Inventory Form*. If the “Quantity On Hand” information has been recorded, ask participants to subtract the “Quantity On Hand” number from the “Quantity Needed” number for each thermometer type to determine the “Quantity to Purchase” amount.

Encourage sharing of information among groups.

### Purchasing Thermometers

**Thermometer Purchasing Tips:** The following questions should be kept in mind when developing specifications or evaluating thermometer samples:

- How easy is the thermometer to use?
- How easy is it to calibrate?
- Will the thermometer require batteries? If so, what type of batteries and how often can you expect to replace them?
- Does the thermometer carry the NSF Mark? The NSF Mark indicates that the thermometer was manufactured in accordance with a recognized public health standard and that no materials were used in its manufacture that will be toxic when exposed to food.
- Is the probe receptacle easy to clean and sanitize?
- Is the temperature easily readable?
- Is it a one-time use temperature indicator?



### ACTIVITY IDEA

Have participants break up into groups again. Give each group 2 or 3 different thermometers (in original packages) or 2 or 3 pictures of thermometers. Ask each group to brainstorm the key desirable features of each thermometer. Ask them to think about any features that would make the thermometer easier to use and assure food safety compliance. Have groups share their ideas with the larger group.

Close by distributing Handout 3, *Desirable Features of Various Thermometer Types*, to each participant. Have them follow along as the features are reviewed. Ask participants to suggest additional desirable features based on their experience in using thermometers.

### ALTERNATE ACTIVITY IDEA

Show the second segment of the videotape, *Your Guide to Thermometers in Foodservice*.

**NOTE:** It is recommended that foodservice directors establish a system for purchasing thermometers and explain how the system works to all school managers. The system could be centralized (where the foodservice director purchases all thermometers and distributes them to the schools) or decentralized (where the school site managers order thermometers directly from a vendor). Thermometers for use in schools are widely available from local foodservice equipment suppliers, foodservice distributors, or on the Internet.

In central production facilities or large operations, it may be desirable to determine an “order point.” An order point is the minimum stock level required until the next delivery. This practice ensures that there are adequate thermometers available in the operation to take temperatures required.

## Developing Thermometer Specifications



### Key Point

2

**Accurate specifications assure that appropriate thermometers are being purchased for use in foodservice operations.**

*Estimated time: 20 minutes*

What is a product specification?

Definition: A specification is a precise description of the item desired for purchase.



### ACTIVITY IDEA

**Ask:** Why is it important to use product specifications when purchasing thermometers?

Write down ideas from participants on a flip chart.

**Note:** This activity is designed for use with directors, supervisors, and managers.

A specification should accurately identify the product's characteristics in a way that is mutually understandable to the buyer and the potential vendor. It is a means to assure that managers receive what they expected to buy. Depending on the type of thermometer, bid specifications may include the following information:

- Thermometer type(s)
- Thermometer size(s)
- Temperature range of thermometer(s)
- Desirable features of thermometers
- Quantity needed
- Number and location of delivery sites
- Length of contract
- Any special requirements—such as providing samples for review prior to contract award
- Any special terms of the potential sellers—such as, how the thermometers will be shipped, how thermometers can be re-ordered, and any discounts for compliance with accelerated payment terms

**Sample specification:** Digital stemmed (thermistor) pocket thermometer, waterproof, instant read with minimum 0.25 in. display, stainless steel heavy duty stem, on/off button, carrying case, and NSF Mark. Automatic shut off after 10 minutes if there is no change in temperature. Includes battery. Recalibratable. Range of zero °F to 220 °F and an accuracy of  $\pm 2$  °F.

# Thermometer Inventory Form

School \_\_\_\_\_

Inventory Completed by \_\_\_\_\_

Date \_\_\_\_\_

Thermometer Type	Quantity Needed	Quantity On Hand	Quantity to Purchase
<b>Storage/Appliance</b> <input type="checkbox"/> Refrigerator/Cooler <input type="checkbox"/> Freezer <input type="checkbox"/> Storeroom	_____ _____ _____	_____ _____ _____	_____ _____ _____
<b>Bimetallic Stemmed</b>	_____	_____	_____
<b>Meat (Bimetallic Stemmed)</b>	_____	_____	_____
<b>Digital Stemmed—Thermistor</b>	_____	_____	_____
<b>Thermocouple, digital</b>	_____	_____	_____
<b>Infrared</b>	_____	_____	_____
<b>Equipment</b> <input type="checkbox"/> Oven <input type="checkbox"/> Hot Holding	_____ _____	_____ _____	_____ _____
<b>Single Use Temperature Indicators—T-Sticks® and adhesive thermometers</b>	_____	_____	_____

## Desirable Features of Various Thermometer Types

Thermometer Type	Desirable Features
Storage/Appliance	<ul style="list-style-type: none"> <li>■ NSF Mark</li> <li>■ Easy to read display</li> <li>■ Easy to hang, mount, or place in equipment</li> <li>■ Accuracy <math>\pm 2</math> °F</li> </ul>
Bimetallic Stemmed (including meat thermometers)	<ul style="list-style-type: none"> <li>■ NSF Mark</li> <li>■ External dimple to mark end of sensing area</li> <li>■ Easy to read display                             <ul style="list-style-type: none"> <li>• Black block numerals</li> <li>• White background</li> <li>• Red pointer</li> <li>• Magnifying lens</li> </ul> </li> <li>■ Shatter-proof lens</li> <li>■ Accuracy <math>\pm 2</math> °F</li> </ul>
Digital Stemmed (Thermistor)	<ul style="list-style-type: none"> <li>■ NSF Mark</li> <li>■ Easy-to-read liquid crystal display (LCD)—minimum of 0.25 in.</li> <li>■ On/Off button</li> <li>■ Automatic shut-off when not in use</li> <li>■ Sensor located in probe tip</li> <li>■ Accuracy <math>\pm 2</math> °F</li> </ul>
Thermocouple, digital	<ul style="list-style-type: none"> <li>■ NSF Mark</li> <li>■ Backlit LCD</li> <li>■ Holding button freezes current reading</li> <li>■ Housing design is easy to hold and clean</li> <li>■ Probes are easy to clean and sanitize</li> <li>■ Annual recalibration from manufacturer is available</li> <li>■ Accuracy <math>\pm 2</math> °F</li> <li>■ Other features: Automatic download to personal computer; may be programmed to record temperatures over time</li> </ul>
Infrared	<ul style="list-style-type: none"> <li>■ NSF Mark</li> <li>■ Easy-to-read LCD—minimum of 0.25 in.</li> <li>■ Lightweight</li> <li>■ Easy to hold and clean</li> <li>■ Annual recalibration from manufacturer is available</li> <li>■ Accuracy <math>\pm 2</math> °F</li> </ul>
Equipment	<ul style="list-style-type: none"> <li>■ NSF Mark</li> <li>■ Easy-to-read display</li> <li>■ Preset indicator to show when product has reached desired safe temperature</li> <li>■ Accuracy <math>\pm 2</math> °F</li> </ul>