

# **N** **Time T** **Teach**

## **Using and Calibrating a Bi-Metallic Stemmed Thermometer**

**Lesson Participants:** Central Warehouse Employees

**Type of Lesson:** Face-to-face teaching session

**Objective:** Demonstrate how to accurately calibrate and use a thermometer.

### **Materials Needed:**

- Leader's Script
- Pens or Pencils (one for each employee)
- Example Scenario (one for each employee)
- 1 or 2 accurately calibrated thermometers
- 1 or 2 cups of ice
- 1 or 2 cups of water
- A picture showing the temperature danger zone. (See page 5 of this lesson or download from [http://www.olemiss.edu/depts/nfsmi/Information/temp\\_miniposter.pdf](http://www.olemiss.edu/depts/nfsmi/Information/temp_miniposter.pdf))



# Leader's Script:

## Using and Calibrating a Bi-Metal Thermometer

### Introduction: (1 minute)

**SAY:** For the next 10 minutes we will be talking about calibration of thermometers. Proper calibration of thermometers is the only way to measure accurate temperatures of food. Calibration and correct use of thermometers ensures that the food temperatures being measured are acceptable. This is extremely important with time-temperature controlled for safety (TCS) foods. At the end of this lesson you will be able to demonstrate how to use and calibrate a bi-metal thermometer.

### Temperature Danger Zone: (2 minutes)

**SAY:** Before you can use and calibrate a thermometer, you must know what temperature you are looking for with specific TCS foods. We want refrigerated foods below 41 degrees and we want hot foods above 135 degrees. A food with a temperature between 41 and 135 degrees is considered in the temperature danger zone. When TCS food temperatures are found within this range, harmful bacteria can grow and multiply, which could cause food-borne illnesses.

**DO:** Show picture of temperature danger zone and ask if there are any questions.

### Calibration: (5 minutes)

**SAY:** Now that we know what temperature are acceptable for a variety of foods, let's look at how to calibrate and use the thermometer. We will be using the ice-point method to check and calibrate a thermometer. When using ice-point method the thermometer must measure 32 degrees. Let's look at how to calibrate a thermometer using this method. The steps to calibrate a thermometer using the ice point method are:

1. Fill a container with crushed or chipped ice.
2. Add water slowly until it overflows.
3. Add more ice until it is packed tightly to the bottom of the container, allowing excess water to overflow.
4. Insert the stem of the thermometer at least two inches into the container and allow it to stabilize for 5 minutes. Note: It is important that the tip of the thermometer not touch the bottom or sides of the container.
5. If the temperature reading is 32 degrees F., the thermometer is accurately calibrated. If necessary to adjust the thermometer, do so by small increments and allow it to stabilize

before making any additional adjustments. Use needle nose pliers or a small wrench to turn the nut underneath the dial of the thermometer until it reaches 32 degrees when inserted into the ice water bath just described.

**DO:** Take the cups of ice and add the water to them according to the instructions just discussed. Next, place the thermometer into the ice water. Wait for 1 minute and ask every employee to come and look at the thermometer.

**SAY:** Is this thermometer correct?

**DO:** Show the thermometer to employees.

**SAY:** Right, this is correct (assuming that the thermometer is properly calibrated at 32 degrees!). We can now use this thermometer. If it was not correct we would need calibrate it to the correct temperature or throw it away if it is not able to be properly calibrated. Every thermometer should be calibrated once every morning before receiving and storage begins, every time a thermometer is dropped, and any time a thermometer is exposed to extreme heat. *<Note to presenter: demonstrate how to use the pliers or wrench to calibrate a thermometer that is not accurate>.*

### **Example Scenario: (2 minutes)**

**DO:** Pass out example scenario, pens and pencils.

**SAY:** Now we will go over an example scenario. I will distribute the handout. Read the directions and complete the scenario. We will review once everyone is finished.

What is wrong with the way Mark handled the thermometers? Mark should have checked all eight of the thermometers. In addition he should have adjusted the four thermometers that did not register 32 degrees when placed into the ice water. What should the warehouse manager do? The manager should periodically check employee performance and provide additional instruction to employees who are not following appropriate food safety procedures.

### **Continuing Education Documentation:**

**DO:** Complete the continuing education report at the end of this lesson, obtain participant signatures, and file in *HACCP Section: Continuing Education*.



## Example Scenario

### What's Wrong?

**Directions:** In the space provided, tell what the employee did wrong?

Mark is responsible for calibrating all the thermometers used to check food temperatures. There are eight thermometers in the storage area that are available for use by employees. He collects six of the thermometers from the storage area and then gets a large cup, fills it with ice and then cold water. He waits a little while for it to get cold. Next, he places the thermometers stem down into the ice water. Two of the thermometers read 32 degrees and four did not. He makes no adjustments and then places all of the thermometers back in their storage area to be used for checking food products for the day's deliveries. Mark reports to the warehouse manager that he has checked the accuracy and calibrated of all the thermometers.

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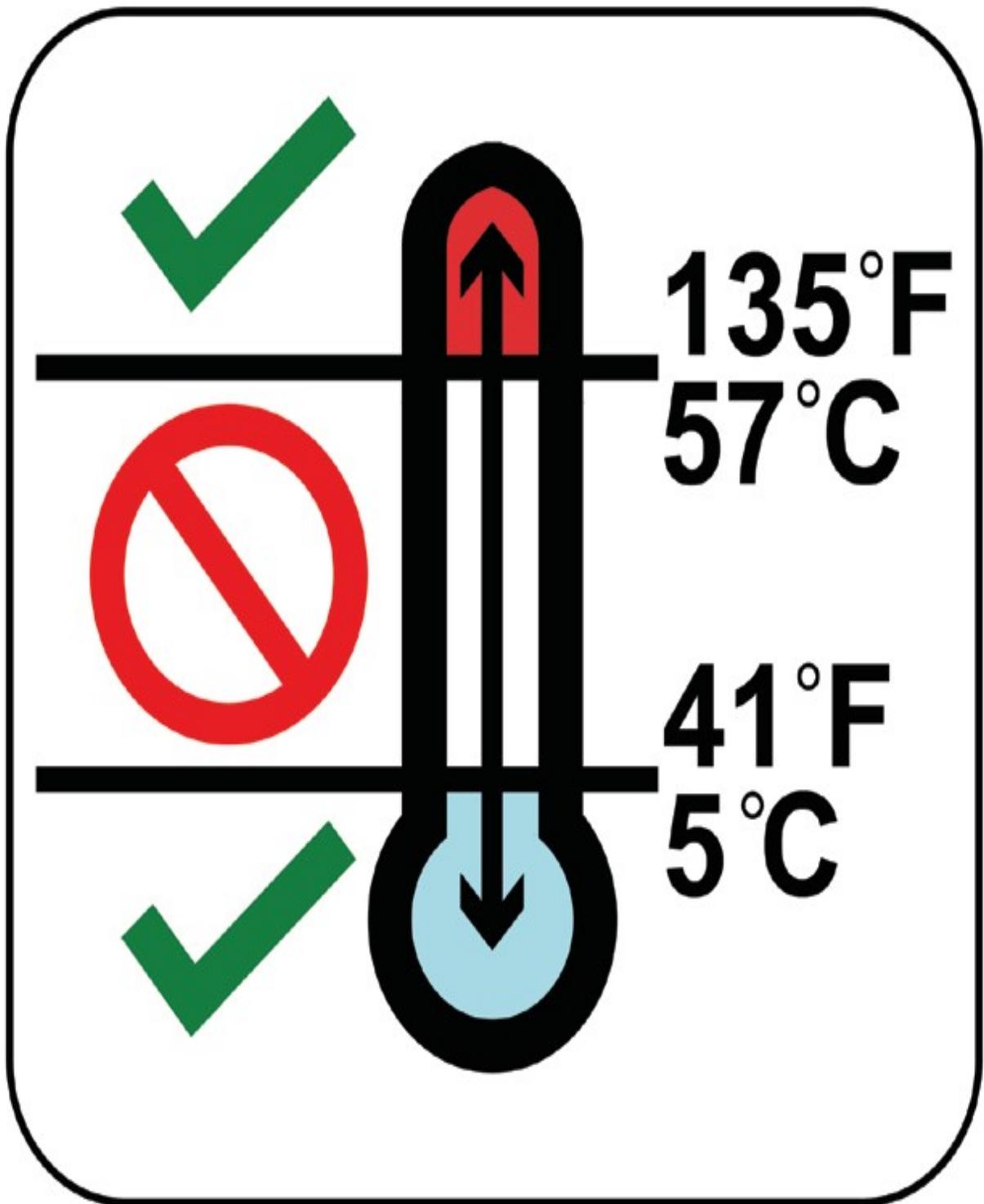
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Temperature Danger Zone



**FOOD SAFETY AND HACCP CONTINUING EDUCATION REPORT**

**(Complete this report and File in HACCP Section: Continuing Education)**

**LESSON TITLE:** **No Time To Teach: Using and Calibrating a Bi-Metalic Stemmed Thermometer**

**DATE:** \_\_\_\_\_

**LOCATION:** \_\_\_\_\_

**INSTRUCTOR:** \_\_\_\_\_

**Lesson Agenda/Outline is attached:**  **Yes**  **No**

PARTICIPANT NAME	SCHOOL