

TIME-TEMPERATURE CONTROL

Temperature abuse of food is the number one cause of food-borne illness. Temperature abuse can include such things as leaving food out at room temperature to thaw, not cooling foods fast enough through the Danger Zone, not refrigerating food at the proper temperature, not thoroughly cooking foods, or not hot-holding food at the proper temperature. Controlling the temperature of hazardous food is the easiest thing a food handler can do to prevent the growth of bacteria.

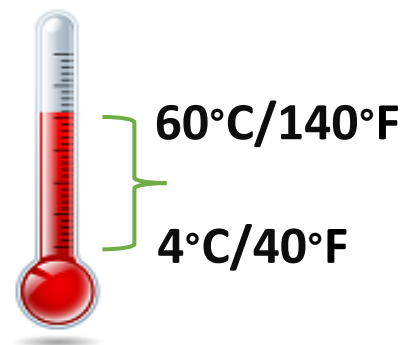
THE DANGER ZONE

- The temperature range from **4°C – 60°C** (40°F - 140°F).
- Pathogenic bacteria multiply quickly in the Danger zone, especially 20°C - 35°C
- Keep hot food hot (60°C or above)
- Keep cold food cold (4°C or below)

Danger Zone

Common Danger Zone No-no's:

1. Leaving food to cool to room temperature before putting it in the cooler/freezer
2. Thawing hazardous foods on the counter overnight
3. Reheating food in a chafing dish
4. Putting a very deep pot of food in a standard fridge to cool overnight



THERMOMETERS

Visual cues can be misleading. For example, hamburgers are not always done when meat turns pink to brown and the juice run clear. Using a thermometer to make sure food is kept out of the Danger Zone as much as possible is the easiest way to prevent food-borne illness.

A probe thermometer is the only way to be sure food has been cooked to a safe internal temperature.

Types of Thermometers

Indicating Thermometer

- Designed to indicate storage temperature
- Must be placed in the warmest part of the device to get a proper temperature
- Check daily
- Required by law in all coolers, refrigerators, freezers, and display cases



Laser/Infrared Thermometer

- Designed to give instant temperature read-out, only scans surface temperatures
- Not appropriate for verifying internal temperatures of food
- Does not replace need for indicating thermometers

Probe Thermometer

- Fast reading of internal temperature of food
- Required by law
- Bi-metal probe thermometer must be calibrated before use
- Most digital probe thermometers cannot be calibrated
- Generally not designed to remain in food during the cooking process



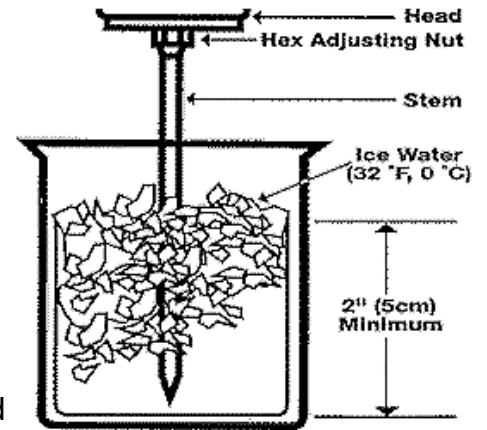
How to Use a Probe Thermometer:

- 1) Insert into thickest part of the food and do not touch bone or container
- 2) Clean and sanitize the probe between uses
- 3) Record the temperatures in a log book



How to Calibrate a Probe Thermometer

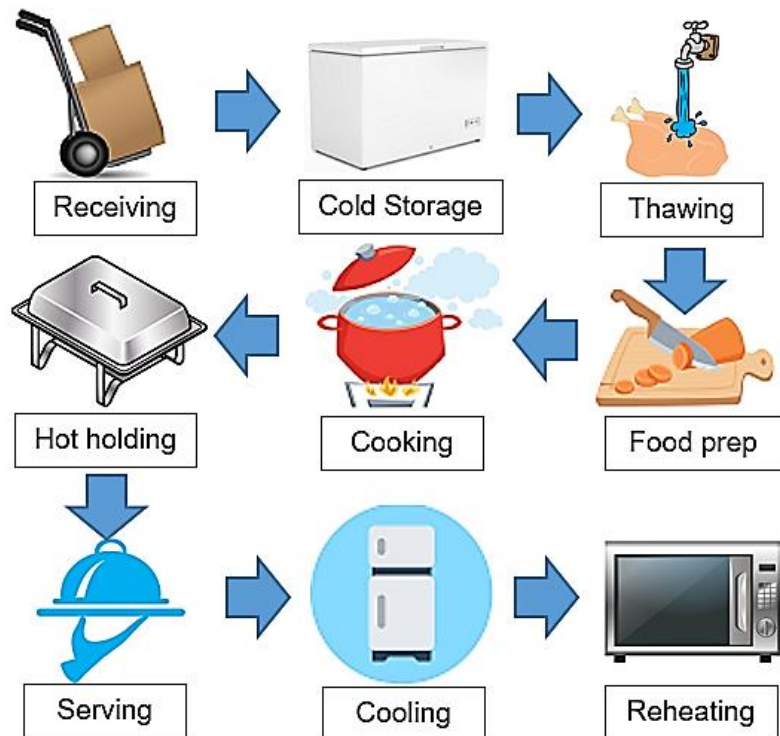
1. Fill a cup with a 50/50 mix of crushed ice and water
2. Temperature of the mix will be 0°C (32°F)
3. Without touching bottom or sides of cup, place thermometer at least 2 inches into mix
4. Wait until needle stops moving. If needle does not read 0°C (32°F), adjust
5. While keeping the thermometer in the mix, use pliers to turn the nut behind the head. As the nut turns, the needle will move. Set to 0°C (32°F)



FLOW OF FOOD

There are many opportunities for temperature abuse to occur during food handling. Remember to check temperatures when food is:

- Received
- Stored
- Thawed
- Prepared
- Cooked
- Hot-held
- Served
- Cooled
- Reheated



Cold Holding (Refrigerator and Freezer)

- Keep cold foods cold 4°C (40°F) or lower
- Keep frozen meats at -18°C (0°F) or colder. It slows growth of bacteria and kills parasites and their eggs
- Monitor temperatures
- Do not refreeze without cooking first
- Keep food covered
- **Store raw meats on bottom**, fruits and vegetables in the middle, and ready-to-eat food on top



Thawing

Food can be thawed safely in 4 ways:

1. In the refrigerator at 4°C (40°F) or less
2. In the microwave (use caution)
3. Under **running COLD** water over plastic wrapped item
4. Cooking from the frozen state

DO NOT THAW FOOD AT ROOM TEMPERATURE!

Food Preparation (Room Temperature Holding)

- **'2 Hour Rule'** – Hazardous foods left at room temperature for more than 2 hours must be thrown away
- While food is left a room temperature, time accumulates against the '2 Hour Rule', it does not reset each time food is put back into fridge
- If you're not sure how much food you need to work with, take out as much as you like and put food in an ice-bath (a large bowl of ice surrounded by a smaller metal bowl of food). Leftovers can be placed back into the fridge



Cooking Temperatures

MEAT	Minimum temperature
<ul style="list-style-type: none">Beef/veal steaks and roasts	63°C (145°F) - medium-rare 71°C (160°F) - medium 77°C (171°F) - well done
<ul style="list-style-type: none">Fish	70°C (158°F)
<ul style="list-style-type: none">Pork chops, ribs, roasts;Ground beef/veal/pork including sausages	71°C (160°F)
<ul style="list-style-type: none">Stuffing and casseroles, hot dogs, leftovers, egg dishes;Hazardous food mixturesGround chicken/turkey including sausages	74°C (165°F)
<ul style="list-style-type: none">Chicken and turkey pieces	74°C (165°F)
<ul style="list-style-type: none">Chicken and turkey, whole bird	82°C (180°F)

Hot-Holding

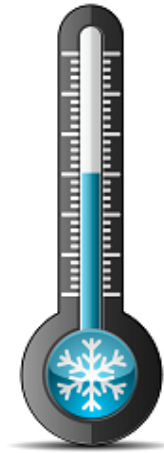
- Once a hazardous food is cooked or reheated to the required temperature, it can be hot held (kept warm) until served. Self-serve buffet steam tables are an example of hot holding equipment
- Monitor temperature to ensure hot held food kept **at 60°C (140°F) or higher**
- Heat lamps are not sufficient hot-holding equipment. Discard any hot held food not kept to at least 60°C (140°F) for more than 2 hours



Cooling

Cool foods from:

- **60°C - 20°C (140°F – 70°F) within 2 hours**
- **20 °C – 4 °C (70°F – 40°F) or less within 4 hours**
- **Total cooling time must not exceed 6 hours!**
- Faster food is cooled, the less chance for bacterial growth



Cooling Methods:

- Transfer cooked food in deep pans to shallow pans
- Partially cover pans to protect food from contamination while allowing heat to escape
- Place the pans in the refrigerator right away
- Store these containers on the top shelves to reduce the risk of cross-contamination
- You can cool food in large containers faster by:
 - Placing the container in a sink or larger container of ice water (ice bath)
 - Stirring with an ice wand
 - Adding ice directly to the food
 - Dividing food into small portions

Reheating

- If previously cooked foods are to be reheated but not served immediately (i.e. hot-holding), reheat to an internal temperature of **at least 74°C (165°F)**
- A minimum of 74°C (165°F) must be maintained for **at least 15 seconds**
- Take no longer than **2 hours** to reheat foods to at least 74°C (165°F)
- Boil and stir stews, soups, and gravies
- Inappropriate methods to reheat:
 - Holding ovens
 - Steam tables
 - Chafing dishes
 - Soup urns

