

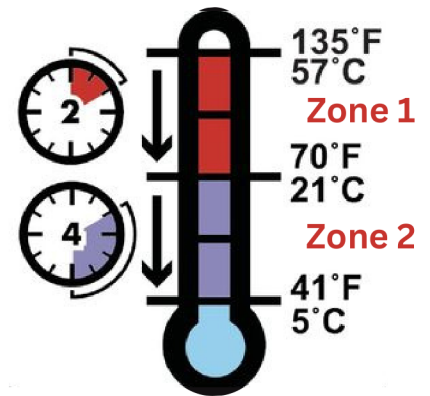
# 2-Zone Cooling & Cooling from Room Temperature (RT)

**Correct cooling is critical to control the growth of microbes in food. Improperly cooled foods will increase the number of spore-forming and toxin-producing microbes in the food.**

*Time and Temperature Controlled for Safety Foods (TCS)* must be cooled completely in a total of **6 hours**.\*

Once foods reach **135°F**, they must cool to **70°F** within **2 hours** (**Zone 1**). Foods then need to cool to **41°F** within an additional **4 hours** (**Zone 2**).

Checking temperatures during the cooling process, using accurate thermometers, is necessary to control the growth of spore-forming and toxin-producing micro-organisms.



## Formulas for 2-Zone Cooling:

### Zone 1 Formula:

$135^{\circ}\text{F} - 70^{\circ}\text{F} = 65^{\circ}\text{F}$   
 $65^{\circ}\text{F} \div 120 \text{ minutes (2hrs)} = .54^{\circ}\text{F/min (BASE RATE)}$

FOOD		TEMPERATURE	TIME
Eggplant and Chicken Lasagna	1ST TEMP.	185°F	3:45PM
	2ND TEMP.	167°F	4:15PM
		-18°F	30 min

$18^{\circ}\text{F} \div 30 \text{ minutes} = 0.60^{\circ}\text{F}$  drop per minute cooling rate.  
 If greater than **.54°F**, cooling will meet requirements.

### Zone 2 Formula:

$70^{\circ}\text{F} - 41^{\circ}\text{F} = 29^{\circ}\text{F}$   
 $29^{\circ}\text{F} \div 240 \text{ mins (4hrs)} = .12^{\circ}\text{F/min (BASE RATE)}$

FOOD		TEMPERATURE	TIME
Eggplant and Chicken Lasagna	1ST TEMP.	113°F	5:45PM
	2ND TEMP.	99°F	6:15PM
		-14°F	30 min

$14^{\circ}\text{F} \div 30 \text{ minutes} = 0.46^{\circ}\text{F}$  drop per minute cooling rate.  
 If greater than **.12°F**, cooling will meet requirements.

## CORRECTIVE ACTION

Foods may be reheated to **165°F** and the cooling process re-started using a different cooling method if the food has:

Cooled at or below **70°F** in **2 hours** or less; **and**

Cooled at or below **41°F** in **6 hours** or less.

## DISCARD IMMEDIATELY IF FOOD IS:

- Above **70°F** and more than **2 hours** into the cooling process.
- Above **41°F** and more than **6 hours** into the cooling process.
- \*Above **41°F** for more than **4 hours** when cooling from RT.

## Formula to Cool from Room Temperature (RT):

$78^{\circ}\text{F (Current Air Temperature of Kitchen)} - 41^{\circ}\text{F} = 37^{\circ}\text{F}$   
 $37^{\circ}\text{F} \div 240 \text{ mins (4hrs)} = .15^{\circ}\text{F/min (BASE RATE)}$

FOOD		TEMPERATURE	TIME
Sliced Tomatoes	1ST TEMP.	78°F	9:45AM
	2ND TEMP.	69°F	10:15AM
		-9°F	30 min

\*Cooling from RT must be completed in **4hrs. or less.**

$9^{\circ}\text{F} \div 30 \text{ minutes} = 0.3^{\circ}\text{F}$  drop per minute cooling rate.  
 If greater than **.15°F**, cooling will meet requirements.