



# FOOD SAFETY FOR SAFE AND WHOLESOME FOODS

With Dr. Jang Ho Kim, University of Idaho Extension

The webinar will begin promptly at  
11:00 am Pacific / 12:00 pm Mountain

Funded by:



United States Department of Agriculture  
National Institute of Food and Agriculture



University of Idaho  
Extension





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# Webinar Tips



**Close all other programs running on your computer**



**Check your sound – problems with clarity, speed, etc. switch to the phone**

Call-in number provided in the welcome email

Mute computer sound when using phone



**Type in questions for speakers (or for help with viewing & sound) into question box**



**Handouts are available to download on your computer**

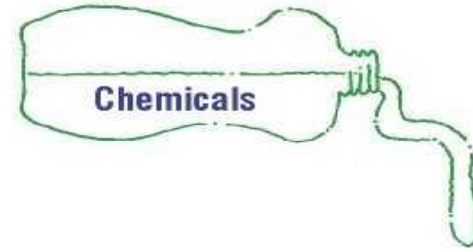
# Food Poisoning

- Illness from consuming food that contains a harmful substance, harmful microorganisms or their toxins.
- Common symptoms:
  - Stomachaches
  - Vomiting
  - Diarrhea
  - Fever
- Can result in long-term diseases and death.
- Often caused by food that looks, smells and tastes normal.

# Types of Hazards in Food

- Food can be contaminated by:
  - Chemical hazard
  - Physical hazard
  - Biological hazard

# Chemical Hazards



- Chemicals in the kitchen include those used:
- To clean working surfaces and equipment
- As pesticides
- Chemicals can be very harmful if they are:
- Spilt on or near food
- Mistaken for food or drink

# Chemical Hazards: Natural toxins

- Toxins are poisonous substances produced by some microorganisms, plants, and animals.
- Most toxins that cause food poisoning are tasteless and remain dangerous when cooked.



# Physical Hazards

- Foreign matter can:
  - Physically injure people
  - Introduce harmful bacteria into food
- Examples of foreign matter include:
  - Dead insects
  - Hair
  - Jewelry
  - Glass
  - Metal





# Biological Hazards

- The microorganisms that can make us sick include:
  - Virus (rotavirus, Norwalk virus..)
  - Bacteria (Salmonella, E. coli, Listeria...)
  - Parasites (Toxoplasma gondii, Trichinella spiralis..)
  - Mold (Apergillus flavus)
  - Microorganisms such as viruses and bacteria are the most common causes of food poisoning.

# Salmonella



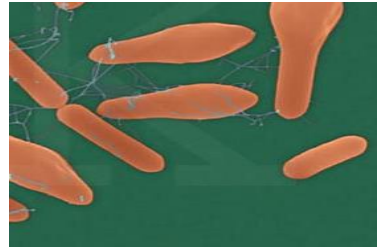
- Sources – intestines of people and carriers, animals and animal food, raw meat and poultry, raw milk, raw eggs
- Common food vehicles – undercooked or contaminated cooked meat, raw milk and eggs
- Incubation period – 6 to 72 hours to produce endotoxin in intestines
- Symptoms – abdominal pain, diarrhea, vomit, fever

# Listeria monocytogenes



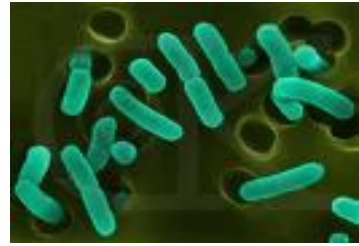
- Sources – soil and water and some animals
- Common food vehicles – unpasteurized milk and dairy products, produce, ready-to-eat products, refrigerated food products, etc.
- Incubation period – 7 to 70 hours
- Symptoms – Fever and diarrhea. Stiff neck, confusion, loss of balance, convulsions, and muscle aches. Seriously dangerous to pregnant women.

# Clostridium botulinum



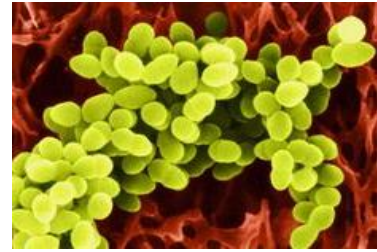
- Sources – Fish intestine, soil, and vegetables
- Common food vehicles – Low acid processed food contaminated after canning or vacuum packaging
- Incubation period – 2 hrs to 5 days. Heat resistant neurotoxin produced in foods
- Symptom – Difficulties in swallowing, talking and breathing. Double vision and paralysis
- Characteristics – Sporeformer. Spores and exotoxin will survive under normal cooking Temp.

# Escherichia coli O157:H7



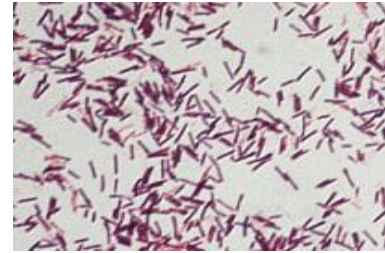
- Sources – Animal intestine, soil, and water
- Common food vehicles – Undercooked or raw meat, vegetables, unpasteurized milk and apple juice, contaminated water
- Incubation period – 2 to 5 days
- Symptoms – watery or bloody diarrhea, nausea, vomiting, cramps, fever
- Characteristics – Haemolytic Uremic Syndrome (HUS). Acute kidney failure in children

# Staphylococcus aureus



- Sources – Human nose, mouth, skin, hands, spots, boils, septic cuts, etc
- Common food vehicles – Dairy products, cold cooked meat and poultry, etc
- Incubation period – 1 to 7 hrs. Exotoxin produced in foods
- Symptoms – Abdominal pain, diarrhea, vomiting, subnormal temperature
- Characteristics – Heat resistant toxin, salt tolerant

# Bacillus cereus



- Sources – Dust and soil
- Common food vehicles – Cereals, corn flour, steamed rice, spices, etc.
- Incubation period – 1 to 5 hrs. Exotoxin produced in foods
- Symptoms – Abdominal pain, diarrhea, vomiting, subnormal temperature
- Characteristics – Sporeformer. Spores and exotoxin will survive under normal cooking temperatures

# Foodborne illness causing agents

Microorganism	Source	Symptoms	Onset Time
<i>Listeria monocytogenes</i>	Unpasteurized food, ready-to-eat or refrigerated food	Stiff neck, confusion, loss of balance, convulsion, body aches	3-70 days
<i>Campylobacter Jejuni</i>	Raw or undercooked poultry, water, milk, feces	Diarrhea, abdominal cramps, fever, nausea	2-5 days
<i>Salomonella spp.</i>	Poultry and egg, milk, beef, fruits	diarrhea, fever, cramps	12-36 hrs
<i>E. Coli O157:H7</i>	Ground beef, fruits, vegetables, milk, water	Watery or bloody diarrhea, nausea, cramps, Hemolytic Uremic Syndrome	2-5 days
<i>Clostridium botulinum</i>	Raw fish and meat, Fruits and vegetables	Paralysis, diarrhea	12-36 hrs
<i>Staphylococcus aureus</i>	Human nose, throat, ears, skin Septic wounds, Animals and raw milk	Vomiting, Abdominal pain, Low temperature	1-7 hrs
<i>Rota virus, Norwalk virus</i>	Feces, vomitus Contaminated foods	Nausea, vomit, diarrhea, abdominal cramps, headache	12-48 hrs



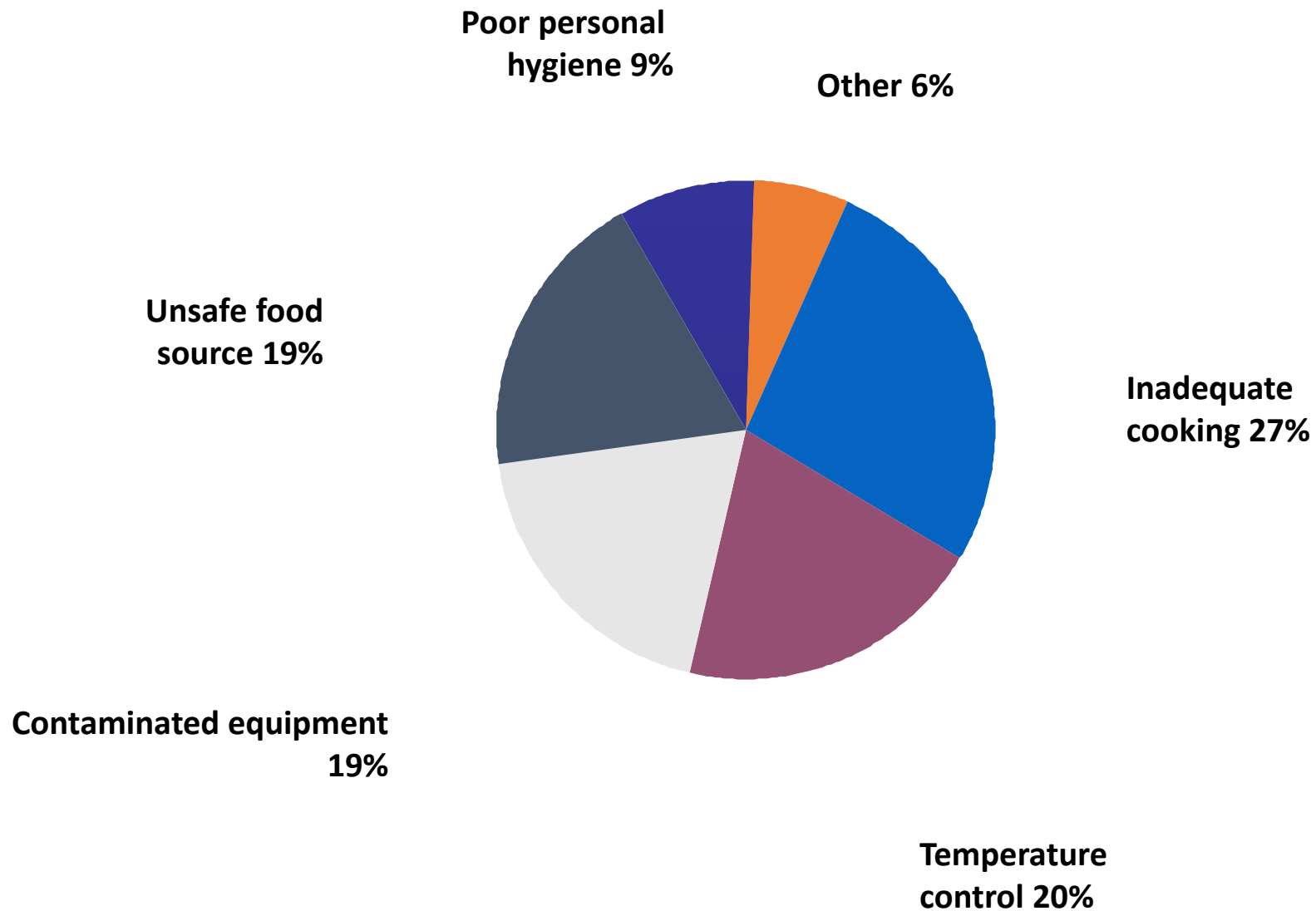
# Transmission

- Contamination can occur at several points along the food chain:
  - On the farm or in the field
  - At the slaughtering house
  - During processing
  - At the point of sale
  - At home

# Risks in produce processing

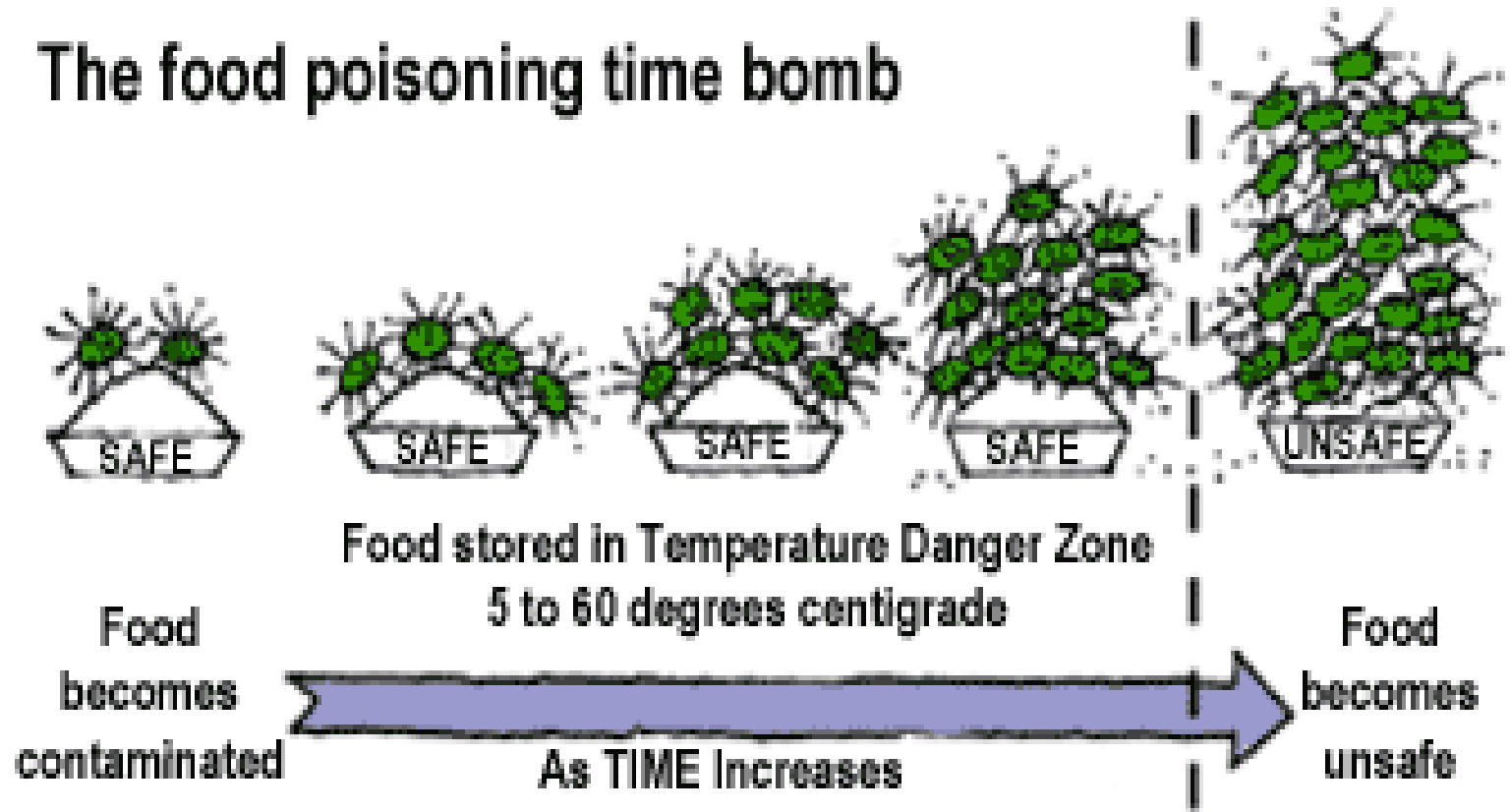
Event	Contamination Source
<b>Production and harvest</b> - Growing, picking, bundling	Irrigation water, manure, poor field sanitation
<b>Initial Processing</b> - Washing, waxing, sorting, packaging	Washing water, handling
<b>Distribution</b> - Transportation	Ice, transportation vehicle
<b>Final Processing</b> - Slicing, squeezing, shredding, peeling, canning	Washing water, handling, cross-contamination

# Factors contributing to food poisoning outbreaks



# Food Poisoning Time Bomb

The food poisoning time bomb



# Strategies to prevent food poisoning

To ensure food does not become contaminated:

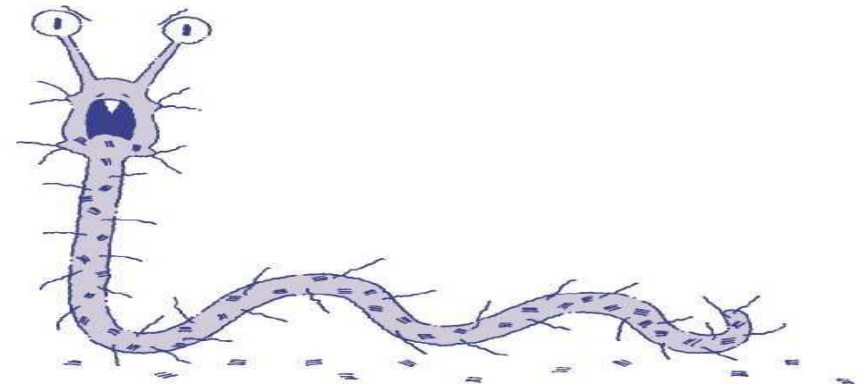
1. Keep hands and nails clean
2. Keep the kitchen clean
3. Handle food safely.

To kill or slow down the growth of micro organisms:

4. Cook high-risk foods thoroughly
5. Keep hot food hot and cold food cold.

# Keeping hands and nails clean

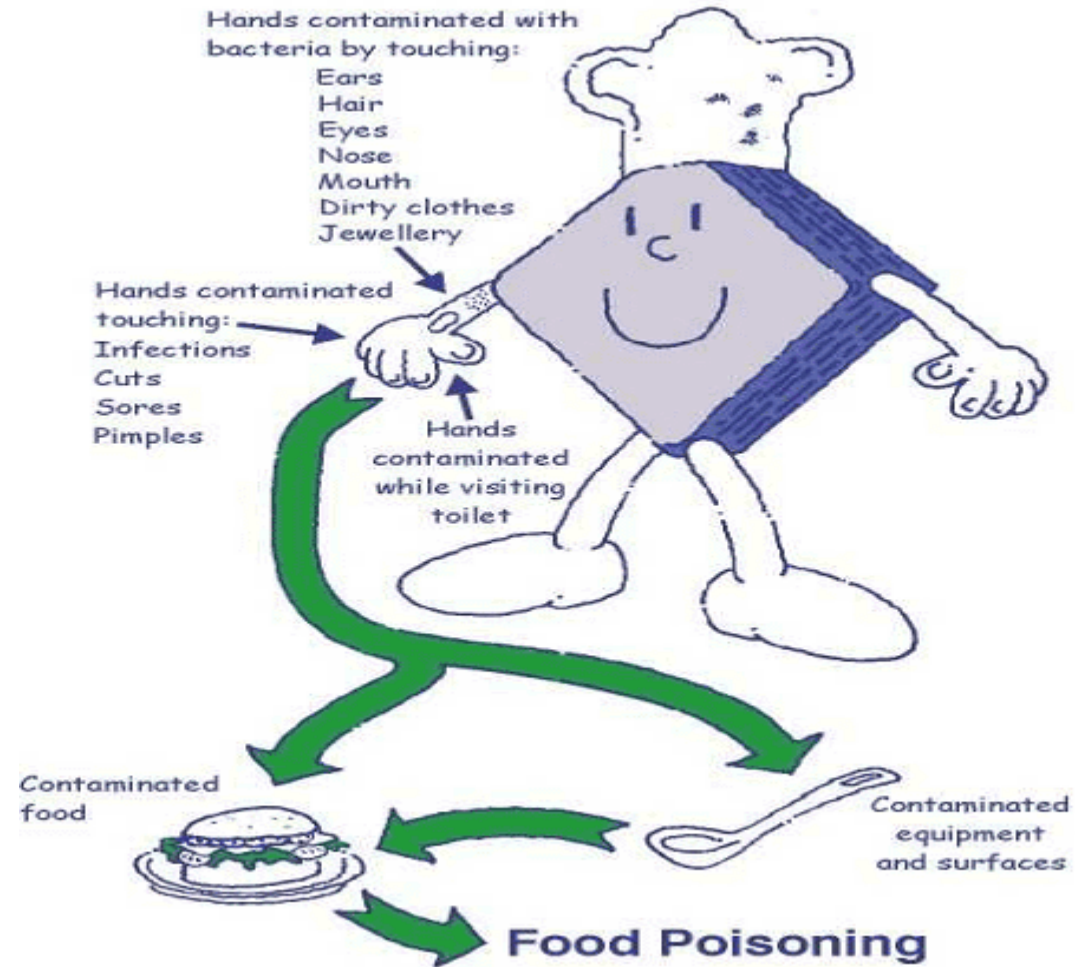
- We need to:
  - wash hands and nails thoroughly with warm, running water and soap
  - dry hands thoroughly
  - cover cuts and infections on hands



# Washing Hands and Nails Thoroughly!

- We should wash our hands:
  - before eating, preparing or handling food
  - between handling raw meat, poultry and seafood, and handling cooked food or food that will be eaten raw
  - after coughing and sneezing, using a handkerchief etc
  - after going to the toilet
  - after handling rubbish
  - after touching animals
  - after handling chemicals (e.g. cleaning products).

# Transfer of Microorganisms by Hands





# Keeping Kitchen Clean

- When cleaning plates and equipment, we need to:
  - scrape and rinse off surface food.
  - wash in clean, soapy water.
  - rinse in clean water.
  - air dry where possible.
  - if drying immediately, use only a clean, dry towel.

# Keeping Kitchen Clean: Pest and Animal Control

- We need to:
  - stop pests such as cockroaches and mice coming into the area where food is kept.
  - discourage pests by not leaving food or dirty dishes out on the benches.
  - keep animals out of the kitchen.

# Handling Food Safety

- We need to:
  - avoid preparing food when sick or feeling unwell.
  - keep raw meats, poultry and seafood separated from cooked food and food to be eaten raw.
  - protect food in the refrigerator by placing in covered containers or covering with plastic wrap.
  - use clean equipment, plates or containers to prevent contamination of cooked food (or food that will be eaten raw) with traces of raw food.

# Handling Food Safety (continued)

- We need to:
  - use clean equipment, rather than hands, to pick up food.
  - wear clean clothes or a clean apron.
  - wash fruit and vegetables to be eaten raw under running water.

# Cooking high-risk foods thoroughly

- We need to cook thoroughly food such as:
  - Mince
  - Burger patties
  - Sausages
  - Rolled roasts
  - Stuffed meats
  - Rabbit
  - Seafood
  - Poultry

**Is it safe to eat?**  
Use a food thermometer to be **SURE**.

**165°F**  
All Poultry  
Whole, Parts, Ground

**160°F**  
Ground Meat & Egg Dishes  
Beef, Veal, Pork & Lamb

**145°F**  
Fish  
Steaks & Roasts  
+3 minute rest time for  
Beef, Veal, Pork, & Lamb

Dial Thermometer  
2" sensing area

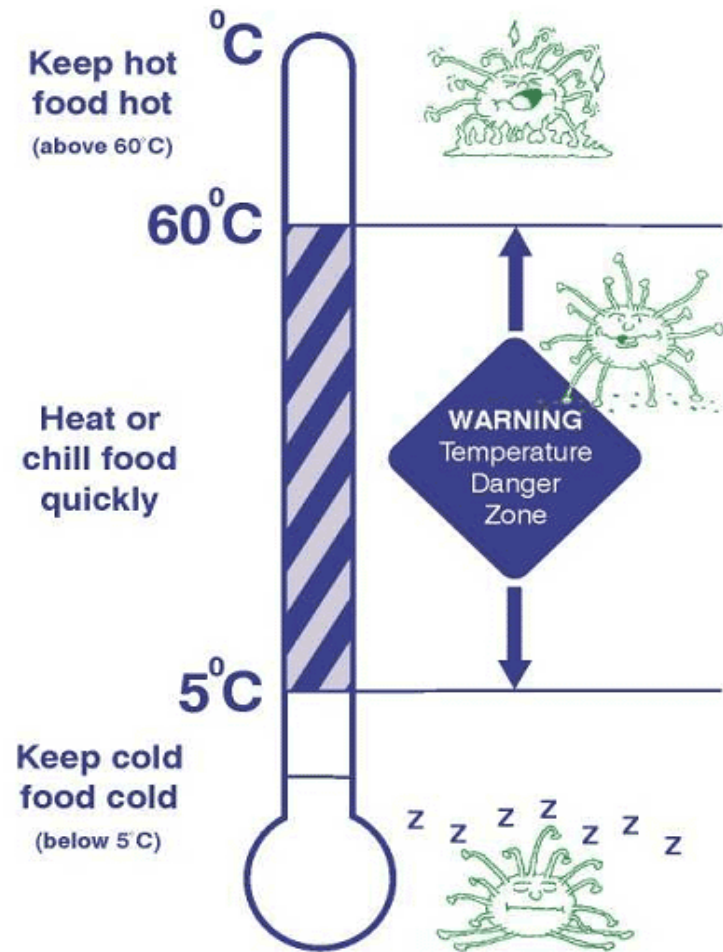
Digital Thermometer  
1/2" sensing area

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# Keeping Hot Food Hot and Cold Food Cold

Avoid  
keeping food  
in the  
temperature  
danger zone of  
**5°C - 60°C**



Bacteria die

Bacteria grow

Bacteria stop growing

# Keeping Hot Food Hot

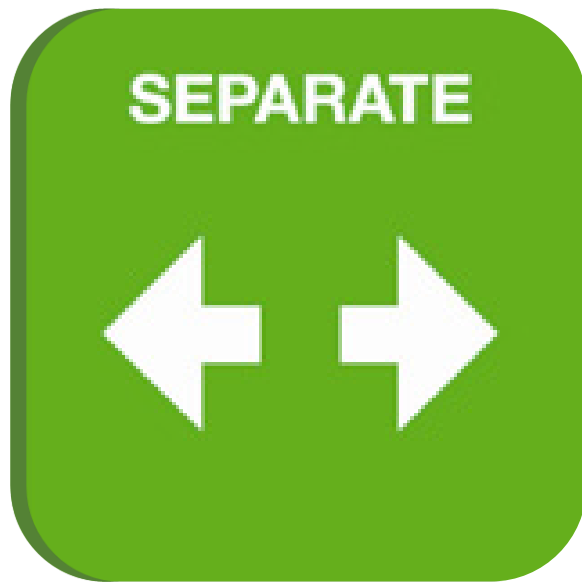
- We need to:
  - keep cooked food at 60°C or above until served.
  - refrigerate or freeze food that is to be prepared well in advance and reheat until steaming hot before serving.
  - cook or reheat packaged food strictly in accordance with any directions on the label.

# Keeping Cold Food Cold

- We need to:
  - take cold groceries home to the refrigerator quickly as possible.
  - keep chilled and frozen food cold if it will be a long time before it can be placed in a refrigerator or freezer.
  - store cold food at 4°C or less.
  - keep cold food in the refrigerator as much as possible.
  - thaw frozen food in the refrigerator or microwave.
  - store and handle cold food according to any directions on the label.
  - check the temperature of the refrigerator regularly.



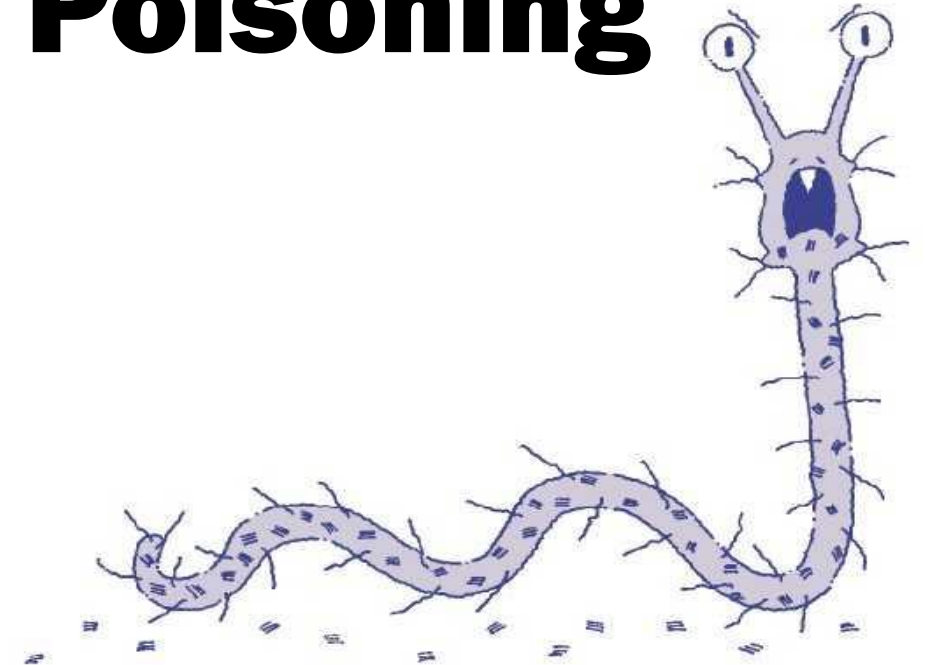
# 4 Simple Steps to Keep your Food Safe



# Summary: Prevent Food Poisoning

We need to:

- keep hands and nails clean.
- keep the kitchen clean.
- handle food safely.
- cook high-risk foods thoroughly.
- keep hot food hot and cold food cold.



**Questions?**

