

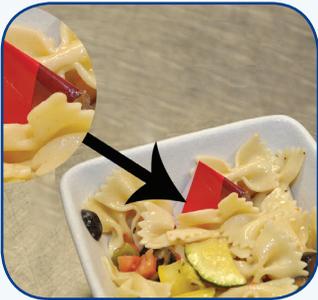
## Chemical Hazards



**Includes:** agricultural chemicals (i.e., pesticides, fertilizers, antibiotics), cleaning and sanitizing compounds, heavy metals (lead and mercury) food additives, and food allergens for allergen-sensitive people

- Toxic substances that may occur naturally or may be added during the preparation or processing of food
- Harmful chemicals have been associated with severe poisonings and allergic reactions
- Chemicals and other non-food items should be labeled clearly and never placed near food items

## Physical Hazards



**Includes:** fragments of glass, metal, frilled toothpicks, jewelry, adhesive bandages, and human hair

- Hard or soft foreign objects in food that can cause illness and injury
- These hazards result from accidental contamination and poor food-handling practices that can occur at many points as food flows from the farm to the table

## Bacteria

**Bacteria** are single-celled microorganisms that require food, moisture, and specific temperatures to multiply. Bacteria can cause foodborne infections, intoxications, and toxin-mediated infections. In retail food establishments, most bacteria are destroyed or controlled by:

- Monitoring time and temperature
- Good personal hygiene practices
- An effective cleaning and sanitation program
- Measures that minimize cross contamination



In order to better describe the interactions of pH and water activity, Tables A and B are provided in Appendix B of this book. The focus of Table A is to describe the conditions needed for a non-TCS food that is prepared, heat-treated, and packaged. Table B describes the conditions needed for a non-TCS food for a prepared and heat-treated food that is not packaged. Note in each table, different criteria are established based on the interaction of different levels of pH and water activity.

The TCS approach gives more flexibility to the food industry to establish storage conditions for foods that will not support growth of pathogenic microorganisms or toxin formation. However, for this approach to work effectively, individuals must understand the concepts of pH and water activity in food and know how to measure them accurately.

Food product consistency is also very important as a slight change in pH or water activity could make a big difference in the relative safety of the food. Even a small change in product formulation can have a large impact on bacterial growth. While the new approach provides greater options for food operators, the concept should be used with caution to ensure food conditions do not permit pathogenic microorganism growth or toxin formation.

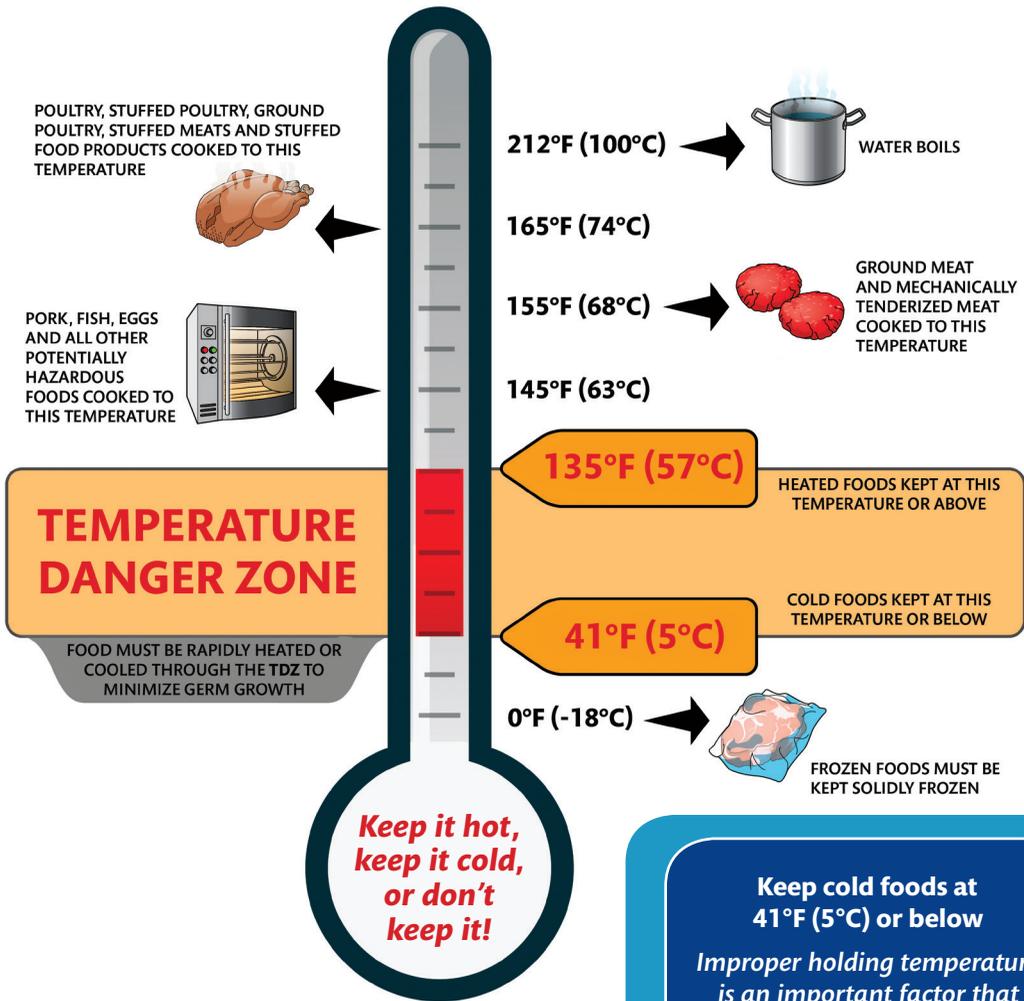
## Ready-to-Eat Foods

**Ready-to-eat (RTE) foods** can become contaminated if not handled properly. The FDA *Food Code* identifies the following types of foods as ready-to-eat:

- Raw animal foods that are cooked (i.e., rotisserie chicken) or frozen (i.e., sushi)
- Raw fruits and vegetables that are washed
- Fruits and vegetables that are cooked for hot-holding
- All time/temperature control for safety foods that are cooked and then cooled
- Bakery items, such as bread, cakes, pies, fillings, or icing, for which further cooking is not required for food safety
- Substances derived from plants, such as spices, seasonings, and sugar
- Plant foods for which further washing, cooking, or other processing is not required for food safety and from which rinds, peels, husks, or shells, if naturally present, are removed

**Ready-to-eat foods are food items that are edible without washing, cooking or additional preparation by the customer or by the retail food establishment**





- The preferred method for thawing foods is in the refrigerator at 41°F (5°C) or below. This prevents the food from entering the food temperature danger zone
- Other acceptable methods for thawing include using a microwave oven, as a part of the cooking process, or submerging under cool running water 70°F (21°C) or below for a controlled amount of time. Proper thawing reduces the chances for bacterial growth, especially on the outer surfaces of food
- More detailed strategies for minimizing the amount of time a food is in the temperature danger zone during cooling, thawing, and food preparation are presented in the next chapter