# 4. Food Safety

### **Learning Objectives:**

- Explain why food safety is a major concern.
- Identify some sources of pathogens and other contaminants in food.
- Explain the differences between foodborne intoxication and foodborne infection.
- List strategies for food safety at home and while eating out

Food Borne Illnesses - Symptoms or illness from food or water that contains an infectious agent or a toxin

Prevalence of foodborne illness - In the U.S. annually: ~48 million people, 127K hospitalizations, 3000 deaths

## **Caused by contaminated foods** – Common contaminants:

- Pathogens bacteria, mold, viruses, fungi, parasites
- Insect parts certain parts-per-million (ppm) allowed
- Pesticide residues
- Chemicals from food processing

### How do pathogens get into food?

• Transfer of fecal matter (human an animal)

Insects, rodents

Poor hygiene

Improper food handling

Temperature of cooking and/or storage

*Cross contamination* – transfer of pathogens from one food to another.

#### High Risk Foods -

- Microbes require warmth, moisture, source of nutrients, perhaps oxygen
- High risk foods are warm, moist, and nutrient-rich, neutral or slightly acidic pH

#### High Risk Groups -

- Pregnant women *listeria* is a common concern
- Very young children
- Older individuals
- People with weakened immune systems from disease or some medical treatments

#### Signs and Symptoms -

GI distress – nausea, vomiting, diarrhea, cramps, bloody stools, headache, lethargy, appetite loss, fever

#### Most common pathogens causing food borne illnesses:

- Bacteria Multiply in food when conditions are favorable
  - o Preformed toxins Campylobacter, Clostridium perfringens, Staphylococcus aureus
  - o Enterohemorrhagic Salmonella

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- Viruses Only multiply inside the living cells of a host
  - o Norovirus, Hepatitis A
- Parasites cannot multiply in food but survive in the environment
  - o Giardia, Trichinella

http://www.fda.gov/food/foodborneillnesscontaminants/causesofillnessbadbugbook/default.htm

## Foodborne Intoxication vs Foodborne Infection

- <u>Intoxication</u> caused by ingesting foods that contains a toxin (could be naturally present in the food, chemical contaminants, or might have been produced by bacteria or fungi).
- <u>Infection</u> caused by consuming foods contaminated with microorganisms (viruses, parasites, and bacteria) that can multiply in the intestines causing illness.

**Top 5 pathogens causing foodborne illness in the U.S.** – norovirus, salmonella, clostridium perfringens, campylobacter, staph. aureus.

## Strategies for preventing food borne illness:

# Food purchasing

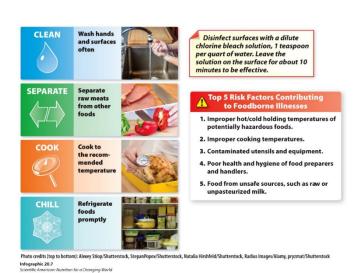
- Pay attention to the "sell by" dates on perishable foods
- Don't buy foods in damaged containers
- Check eggs don't buy cracked

#### **Food preparation**

- Wash hands in hot soapy water for at least 20 seconds before and after touching food
- Separate foods to prevent cross-contamination
- Cook foods to their proper temperature
- Chill foods to prevent microbes from growing
- Wash produce!

# Food storage / temperature

- Danger zone is between 41°F and 135°F
- Thaw frozen foods in the refrigerator (32 to 39 F)
- Marinate foods in the refrigerator
- Store all leftovers in the refrigerator for a limited period of time – *How long?*



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NUTR 200 Nutrition for Today Lecture 4

## How does food get contaminated?

- Production
- Processing
- Distribution
- Preparation

### Pesticides – another contaminant

> Benefits

Increase crop yields

- o insecticides, herbicides, fungicides
- o natural or synthetic
- o can remain as a toxin on foods
- o regulated by the EPA

Help protect against crop losses (increased yields)

Reduce the incidence of disease in crops

> Concerns

When pesticides are used in and around our homes, pets, gardens, communities, environment, and our food

# Organic foods

- Grown without synthetic pesticides, antibiotics, hormones; synthetic fertilizers, genetic manipulations, radiation
- Standards for organic production regulated by USDA

## Considerations in choosing foods wisely

- Food purchases
  - Sell-by date
  - How are foods grown or produced
- Food preparation
  - Cross-contamination
  - Temperature
- · Food handling
  - Hygiene
  - Temperature control

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# **Additional Resources**

http://www.ewg.org

http://www.cspinet.org/foodsafety/

http://www.ewg.org/foodnews/summary/

# **Vocabulary and general knowledge**:

Food-borne intoxication

Foodborne infection

Cross contamination

What groups are considered to be at high risk for food-borne illness?

What temperature range is critical to remember as the danger zone for food storage?

What are some precautions you can take to avoid cross contamination?

Additives

**Pesticides** 

Organic foods