

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 and 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
 - Preformed toxins - *Campylobacter*, *Clostridium perfringens*, *Staphylococcus aureus*
 - Enterohemorrhagic – *Salmonella*

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

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

Foodborne Intoxication vs Foodborne Infection

- Intoxication 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).
- Infection 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!



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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?*

How does food get contaminated?

- Production
- Processing
- Distribution
- Preparation

Pesticides – another contaminant

> Benefits

Increase crop yields

- insecticides, herbicides, fungicides
- natural or synthetic
- can remain as a toxin on foods
- 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