Food and Chemical Safety: Why and How More Now Than Ever

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Outline

❖ Food Safety
  ❖ Overview
  ❖ Foodborne illnesses
  ❖ Food safety concerns in the time of Covid-19
  ❖ Tips for food safety and preventing food borne illness at home

❖ Chemical and Disinfectant Safety
  ❖ Concerns with mis-use during Covid-19
  ❖ Increases in calls to poison control centers
  ❖ Tips for proper use
Food Safety

• What is food safety?
  ➢ Umbrella term for all the things we do to protect food from biological, chemical, and physical contaminants and prevent illness and injury.

  ➢ Farm to Fork
    ➢ Harvest, production, handling, distribution, preparation, storage

  ➢ Many challenges, many responsible parties
Decomposing bat found in Walmart salad prompts rabies tests

Walmart has issued a recall on a packaged salad after Florida customers found a decomposing bat inside the box.

2 Million Pounds of Chicken Recalled
The recall affects 13 fresh and frozen ready-to-cook chicken products from Simmons Prepared Foods.

Pre-cut melon sold in several states recalled; 93 people sick in salmonella outbreak

Can Food From an Infected Cook Give You COVID-19?

Inspections, citations, recalls slashed: Coronavirus is testing America’s food safety net
Foodborne Illness

• Also called food poisoning, foodborne disease, and foodborne infection

• Definition:
  – Sickness people experience after consuming food and beverages contaminated with *pathogenic* (disease-causing) *microorganisms, chemicals, or physical agents*

• Common symptoms:
  – vomiting, diarrhea, nausea, abdominal pain, and fever

• Outbreaks occur when two or more people experience the same illness as a result of consuming contaminated food
Food Safety – Key Players and Regulators

• The United Nations, Food and Agriculture Organization (UN FAO)

• United States Department of Agriculture (USDA)
  – Food Safety and Inspection Service

• United States Food and Drug Administration (FDA)
  – Center for Food Safety and Applied Nutrition

• United States Center for Disease Control and Prevention (CDC)
  – Surveillance, Investigations, Education

• State and Local Health Departments
  - Policy Assurance - Enforcement of policies and standards, education
UN FAO, 2003

“when all people at all times have physical, social, and economic access to sufficient, safe, and nutritious food which meets their dietary needs and food preferences for a healthy and active life.”

Food Safety and Food Security – Inextricably Linked

Figure 1: Interrelationship of food safety and food security.
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Foodborne Illness – Descriptive Epi

**United States (CDC)**
- 1 in 6 people affected annually (48 million)
- 128,000 hospitalizations
- 3,000 deaths

**Globally (WHO)**
- 1 in 10 people affected annually (600 million)
- 420,000 deaths
- 33 million healthy life years lost
- Children under 5 = 40% of foodborne disease burden
Vulnerable Populations and Disparities

- **Vulnerable:**
  - Children, pregnant women, older adults, those with a compromised immune system

- **Racial/ethnic and income disparities?**
  - Limitations in surveillance systems
  - Higher rates of *Yersinia, Listeria, Salmonella, Shigella, Campylobacter*
  - Where in the farm to fork continuum are certain populations more at risk?

Source: CDC  [https://www.cdc.gov/foodsafety/communication/socialmedia.html](https://www.cdc.gov/foodsafety/communication/socialmedia.html)
## TABLE 1. Number of laboratory-diagnosed bacterial and parasitic infections, hospitalizations, and deaths, incidence and percentage change compared with 2016–2018 average annual incidence rate, by pathogen — 10 U.S. sites, Foodborne Diseases Active Surveillance Network,* 2016–2019†

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>2019</th>
<th>No. of infections</th>
<th>No. of hospitalizations (%</th>
<th>No. of deaths (%)</th>
<th>Incidence§</th>
<th>% Change in incidence from 2016–2018 to 2019 (95% CI)¶</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bacteria</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><em>Campylobacter</em></td>
<td>9,731</td>
<td>1,988 (20)</td>
<td>26 (0.3)</td>
<td>19.5</td>
<td>13 (5 to 21)</td>
<td></td>
</tr>
<tr>
<td><em>Salmonella</em></td>
<td>8,556</td>
<td>2,430 (28)</td>
<td>46 (0.5)</td>
<td>17.1</td>
<td>5 (−1 to 12)</td>
<td></td>
</tr>
<tr>
<td>STEC</td>
<td>3,127</td>
<td>660 (21)</td>
<td>10 (0.3)</td>
<td>6.3</td>
<td>34 (14 to 58)</td>
<td></td>
</tr>
<tr>
<td><em>Shigella</em></td>
<td>2,416</td>
<td>644 (27)</td>
<td>3 (0.1)</td>
<td>4.8</td>
<td>7 (−17 to 37)</td>
<td></td>
</tr>
<tr>
<td><em>Yersinia</em></td>
<td>681</td>
<td>142 (21)</td>
<td>4 (0.6)</td>
<td>1.4</td>
<td>153 (102 to 217)</td>
<td></td>
</tr>
<tr>
<td><em>Vibrio</em></td>
<td>466</td>
<td>131 (28)</td>
<td>12 (2.6)</td>
<td>0.9</td>
<td>79 (47 to 117)</td>
<td></td>
</tr>
<tr>
<td><em>Listeria</em></td>
<td>134</td>
<td>131 (98)</td>
<td>21 (16)</td>
<td>0.3</td>
<td>1 (−19 to 27)</td>
<td></td>
</tr>
<tr>
<td><strong>Parasite</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Cyclospora</em></td>
<td>755</td>
<td>38 (5)</td>
<td>0 (0)</td>
<td>1.5</td>
<td>1,209 (708 to 2,020)</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>25,866</td>
<td>6,164 (24)</td>
<td>122 (0.5)</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

**Abbreviations:** CI = confidence interval; N/A = not applicable; STEC = Shiga toxin-producing *Escherichia coli*.

* Data collected from laboratories in Connecticut, Georgia, Maryland, Minnesota, New Mexico, Oregon, Tennessee, and selected counties in California, Colorado, and New York.

† Data are preliminary.

Cases per 100,000 population.

Percentage change reported as increase or decrease. CIs not including zero are statistically significant.

<table>
<thead>
<tr>
<th>Pathogen (% of Known Food Borne Illnesses in the US, 2011)</th>
<th>Typically Found/Spread</th>
<th>Infective Dose</th>
<th>Symptoms start/Incubation period</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Norovirus (58%)</strong></td>
<td>Infected workers contaminating raw foods</td>
<td>18 viral particles</td>
<td>12-48 hours</td>
</tr>
<tr>
<td><em>Salmonella, non-typhoidal (11%)</em></td>
<td>Intestinal tract of humans and animals Meats, milk, eggs, fruits</td>
<td>Varies, as low as one cell</td>
<td>12-72 hours</td>
</tr>
<tr>
<td><strong>Clostridium perfringens (10%)</strong></td>
<td>Undercooked meats, usually mass quantities – stews, casseroles, gravy</td>
<td>&gt;10⁶ cells/g food</td>
<td>8-22 hours</td>
</tr>
<tr>
<td><strong>Campylobacter spp. (9%)</strong></td>
<td>Poultry, unpasteurized milk and cheese</td>
<td>10,000 cells</td>
<td>2-5 days</td>
</tr>
<tr>
<td><strong>Staphylococcus aureus (3%)</strong></td>
<td>Nose, throat, skin, wounds in 30-50% of infected people Spread by food handling/contamination</td>
<td>100,000 cells/g food</td>
<td>2-6 hours</td>
</tr>
</tbody>
</table>


Foodborne Illness

• Heavily under-reported
• WHY?

Photo: Nevada Dept of Public Health Informatics and Epidemiology
CDC FoodNet surveillance – burden of illness pyramid

Source: [CDC FoodNet](https://www.cdc.gov/foodnet)
Food Safety During Covid-19

- Relaxation of regulations/standards
- Fewer Inspections
- Food and food packaging
- Food workers/delivery drivers
- Store and home safety
Relaxation of standards and inspections

**Food inspections, citations fall**
The FDA suspended its inspections of food manufacturers on March 18. Since then, inspections and citations have decreased from hundreds a month to just single digits.

- **Inspections**
- **Citations**

**US FDA**
- Temporary Flexibility Regarding the Egg Safety Rule
- Suspension of Inspections

**USDA**
- Inspections continue, fewer inspectors
- Recalls drastically reduced
- Line Speed Waivers

*Source: U.S. Food and Drug Administration, Carlie Procell/USA Today*
Food Workers, Food Packaging, and Food Delivery

• No evidence that Covid-19 is transmitted through food
• No evidence that Covid-19 is spread by touching food packaging
  – Wipe down groceries?
• Food delivery? →

• Limit in-person contact if possible
• Pay online or on the phone when you order (if possible)
• Accept deliveries without in-person contact whenever possible
• Ask for deliveries to be left in a safe spot outside your house (such as your front porch or lobby), with no person-to-person interaction. Otherwise, stay at least 6 feet away from the delivery person
• After receiving your delivery, wash your hands with soap and water for 20 seconds

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Food Safety at Home

Potentially Hazardous Food

- Animal origin (raw or heat-treated)
- Plant origin (heat-treated)
- Raw seed sprouts
- Cut melons and leafy greens
- Garlic and oil mixtures

- Also known as Time and Temperature Control for Safety (TCS) foods
Time and Temperature

• Temperature Danger Zone:
  - 40 – 140° F

• Time in Danger Zone:
  - 6 hours for cooling (to 70° F within 2 hours, to 40° F within another 4)
  - 2 hours for reheating
  - 2 hours sitting out
    - 1 hour if ambient temp is 90° F or above
Prevention of Foodborne Illness

- Risk factors identified by the CDC as primary contributors to foodborne disease outbreaks
  1. Improper holding temperatures
  2. Poor personal hygiene
  3. Improper cooking temperatures
  4. Foods from unsafe sources
  5. Contaminated equipment and cross contamination
Food Safety at Home

1. **Clean**: Wash hands and surfaces often
2. **Separate**: Don’t Cross-Contaminate
3. **Cook**: To the Right Temperature
4. **Chill**: Refrigerate Properly and Promptly
CHEMICAL SAFETY
Chemical Safety

- Infamous April 23 White House Press Conference

Please Don’t Drink Bleach, Lysol Warns

WATCH // Baldwin's Bleach-drinking Trump Kicks Off Season Finale of 'Saturday Night Live'

'Believe in yourselves, and you can achieve anything. Look at me. I started as the son of a simple, wealthy slumlord and grew to be a billionaire, president and world’s leading expert on infectious disease'

Georgia men reportedly drink bleach, Pine-sol and more to prevent Covid-19

- Spike in Calls to Poison Control Centers
Increases in Calls to Poison Control Centers

FIGURE. Number of daily exposures to cleaners and disinfectants reported to U.S. poison centers — United States, January–March 2018, 2019, and 2020*


† Increase in exposures to cleaners on January 29, 2020, came from an unintentional exposure to a cleaning agent within a school.

Potential Health Impacts of Exposure to Cleaners and Disinfectants

• Dermal and ocular contact
  – Skin and eye irritants
• Inhalation
  – Irritation of airways
    • Acute respiratory distress
    • Aggravation of chronic respiratory conditions
• Ingestion
  – Can have many effects
Children’s Exposures

• Unique exposure pathways
  – Crawling, playing on the floor

• Exploratory behaviors
  – Mouthing

• Different inhalation rates
  – Higher metabolic rate and oxygen consumption rate per unit of body weight than adults
Cleaner and Disinfectant Safety Guidelines

1. Read and follow the directions on the label
2. Only dilute with warm water
3. Avoid mixing
4. Wear eye and skin protection when necessary
5. Ensure adequate ventilation
6. Store chemicals out of the reach of children

List N: Disinfectants for Use Against SARS-CoV-2

https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2
Questions

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