

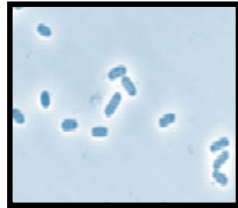
What Emergency Managers Should Know About E. coli O157: Not the Obvious WMD

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According to the Centers for Disease Control and Prevention (CDC), food-borne pathogens and contaminants each year cause:

- more than 76 million illnesses (known pathogens are responsible for 14 million cases);
- 325,000 hospitalizations; and
- up to 5,000 deaths.

One of the culprits is the bacterium *ESCHERICHIA COLI* O157:H7.



diarrhea can lead to a hemolytic uremic syndrome, which causes kidney failure.

The *E. coli* O157:H7 bacteria is usually spread by:

- under-cooked meat.
- non-pasteurized milk and juices.
- sewage-contaminated water.
- poor hygiene and person-to-person contact.

Treatment of illnesses caused by *E. coli* O157:H7 infection is rather difficult. Antibiotics may not always work and can worsen the

symptoms in some cases. The *E. coli* O157:H7 bacteria become active in the human intestines where they receive signals from other (harmless) bacteria and adrenaline molecules. *E. coli* O157 then begin to release toxins that cause severe stomach pain, cramps, nausea and diarrhea. A new study suggests that Beta blockers might be successful in shutting down the communication between the intestine bacteria and the *E. coli* O157 to prevent the release of the toxin.

(continued on page 6)

Majority of Deaths Among Small Children

Each year in the USA alone, *E. coli* O157 sickens more than 70,000 people, 2,000 of whom need hospitalization, and kills up to 60. The majority of deaths due to this infection are small children.

A bacterium is a living single-celled microorganism with a diameter of 1 to 10 microns (a micron is a millionth of a meter). A bacterial cell multiplies simply by dividing; under good conditions (nutrients, temperature, etc.), within 24 hours, one cell can produce up to 4,000,000,000,000,000,000 new bacteria. The combination of letters and numbers in the name refers to specific markers on the surface of a bacterium and distinguishes it from other types.

Hundreds of strains of the *Escherichia coli* bacterium exist; most are harmless. Some are a much-needed part of the human digestive system. On the other hand, the strain known as O157:H7 originates in the intestines of cattle and is a major cause of diarrheal illness in humans. In some cases, particularly with children under five, the elderly, and those with weakened immune systems, bloody

Incidents Involving *E. coli* O157

1992 - USA, Washington, numerous Jack-in-the-Box fast food restaurants: More than 600 people became ill with severe diarrhea after eating under-cooked hamburgers contaminated with *E. coli* O157 bacteria. Three small children died.

1996 October - USA, Washington, Seattle: Contaminated apple juice; more than 70 people developed severe symptoms; one child died.

1996 - Japan, Hungry Tiger fast-food chain: More than 10,000 people became ill after eating domestic beef contaminated with *E. coli* O157.

1998 June - USA, Wyoming, Alpine: Scores of people developed diarrhea and 19 were hospitalized due to an *E. coli* O157 contamination of the town's tap water system.

2000 February - Japan, Tokyo, Hungry Tiger fast-food restaurants: Frozen hamburger patties imported from the USA were contaminated with *E. coli* O157. Eleven people became ill.

2000 July 14– 21 - USA, Milwaukee, Sizzler Restaurant on West Layton Avenue: Watermelons in the salad bar were polluted with *E. coli* O157 caused by contaminated raw sirloin meat. When the meat was thoroughly cooked, the bacteria were killed. However, employees used the same knives and cutting boards for the infected raw meat and the watermelon cuts. Other findings by the Milwaukee health department investigators were:

- employees moved from jobs as cook to server to cashier within one shift;
- employees worked even when they were sick;
- many employees spoke only Spanish but instructions about food-handling procedures were given in English.

More than 60 people became infected at the restaurant, including at least 20 children. A three-year-old child died; two other children may experience long-term health effects.

The contaminated raw meat came to the restaurant from a facility in Fort Morgan, Colorado, that slaughters 4,000 head of cattle each day and belongs to Excel Corporation, the second-largest beef producer in the United States.

2002 May - USA, Colorado, Greeley, ConAgra plant: Contaminated beef was distributed, causing outbreaks in multiple states; at least 47 people became ill and one person died.

O157: Not the Obvious WMD

(continued from page 5)

The key to avoiding the disease is public education about hygiene and food preparation and a comprehensive restaurant inspection program.

- Meat should be cooked until each part has reached a temperature of 160 degrees Fahrenheit.

- Raw meat, utensils, and surfaces used for food preparation must be separated from other food and thoroughly cleaned after use.

- Hands must be thoroughly washed, particularly before and after handling food.

- Fresh fruit and vegetables must be carefully washed.

LA Co. Restaurant Inspections

A significant source of E.coli O157 infections are restaurants. In 1998, the County of Los Angeles established an inspection and rating program for its more than 24,000 restaurants (from McDonalds, to

Starbucks, to 5-star restaurants). The work of the more than 120 county health inspectors has paid off so far. According to a recent study, in the year 1998, food-related illnesses fell by 13 percent in Los Angeles County, while rising to 3.2 percent in other parts of California.

As in other jurisdictions with similar programs, there is an incentive for the restaurant business. Highly-graded (A) restaurants reported an average sales increase of 5.7 percent, while lower-graded (C) restaurants reported a sales decline of at least 1 percent. The results have led more restaurants to improve their food handling practices and facility maintenance. In the first year of the program, 1998, only 57 percent of Los Angeles County restaurants received the A-grade. In 2003, 83 percent have reached the A-level. Access to information about the exemplary program and inspection guidelines in pdf format can be found at www.edmus.info (click on *Hazards and Disasters*, then on *Technological Events*, and finally on *Food Poisoning*).

Conclusion

Consider food-borne diseases an unwelcome but preventable attack against our health. As with acts of terrorism, anyone can become a target. We would never allow a terrorist group to sicken 70,000 Americans every year with fatal results in approximately 60 cases. We cannot, therefore, allow the tiny E. coli H157 bacterium to claim that number of casualties. Public health education and inspection are successful strategies to mitigate disease outbreaks.

For More Information

More information about food contamination and biological agents – including links to the U.S. Department of Agriculture, the U.S. Food and Drug Administration, the U.S. Centers for Disease Control and Prevention, the World Health Organization and the Food Safety Network, is available at www.edmus.info (click on *Hazards and Disasters*, then on *Technological Events*, and finally on *Food Poisoning*).

E.M. News

- **Sen. Murray Addresses Importance of EMPG.** Sen. Patty Murray (D-WA) recently offered an amendment during consideration of the Senate Appropriations package for the Dept. of Homeland Security to add \$100 million to the Emergency Management Performance Grants. The bill as reported by the committee included \$165 million.

Murray Amendment No. 1327 to H.R. 2555 was a stand-alone amendment for this one purpose. It failed on a procedural vote of 45 yeas to 53 nays, with 2 not voting (60 yeas were needed). However, as IAEM Policy Advisor Martha Braddock noted, “It was terrific to hear Senators on the floor discussing the importance of the Emergency Management Performance Grants.”

You can read Sen. Murray’s remarks introducing her amendment on the IAEM Web site at www.iaem.com under the “Emergency Management News” section.

- **FEMA Releases Guidelines for FY 2003 PDM Grant Program.** The Federal Emergency Management Agency has released guidelines for its Fiscal Year 2003 Pre-Disaster Mitigation (PDM) Grant Program. The PDM Grant Program was authorized through the Stafford Act, as amended by the Disaster Mitigation Act of 2000. In 2003, FEMA will provide pre-disaster mitigation funds to tribes, states and communities to implement hazard mitigation planning and mitigation construction projects prior to a disaster event. Approximately \$131.5

million will be available in the form of competitive grants; there is a \$3 million federal share cap per mitigation project. State emergency management agencies, other state-level agencies, federally-recognized tribal governments and local governments are eligible.

Funds should be used primarily for mitigation activities that address natural hazards, but hazards caused by non-natural events are also eligible. A priority has been placed on projects that address National Flood Insurance Program (NFIP) repetitive flood loss properties.

Grant applications must be received by the appropriate FEMA regional office by Oct. 6, 2003. For further information, see the complete PDM guidelines at www.fema.gov/fima/pdm.shtm.