

Information about E Coli

What is Escherichia coli 0157:H7?

E. coli 0157:H7 is one of hundreds of strains of the bacteria Escherichia coli. Although most strains are harmless and live in the intestines of healthy humans and animals this strain produces a powerful toxin and can cause severe illness. The combination of letters and numbers in the name of the bacteria refers to the specific markers on its surface and distinguishes it from other types of E. coli.

The Illness caused by E. coli 0157:H7 - Hemorrhagic colitis

People who are infected with this bacteria often develop severe bloody diarrhea with abdominal cramps although sometimes the infection causes non-bloody diarrhea or no symptoms. Vomiting occurs occasionally. Fever is often low-grade or absent. Symptoms generally begin about 3-4 days after the food was eaten and can last several days.

In some persons, particularly children under 5 years of age and the elderly, the infection can also cause a complication called hemolytic uremic syndrome (HUS), in which the red blood cells are destroyed and the kidneys fail. About 2-7% of infections lead to this complication.

Illness Diagnosis and treatment

Infection with E. coli 0157:H7 can be diagnosed by a stool culture. Most laboratories do not test for E. coli 0157:H7 so physicians must specifically request a culture for this bacteria. In general, 3-5 days are necessary to perform the test after the sample has been received. Most persons recover within a few days without any specific treatment. There is no evidence that antibiotics are helpful and it is thought that treatment with some antibiotics may precipitate kidney complications. Antidiarrhea agents are not recommended. As with all types of diarrhea, it is important to avoid dehydration by drinking plenty of fluids.

Hemolytic uremic syndrome is a serious disease that affects the kidneys and blood clotting system. Physicians use the results of several tests and medical evaluation to determine if a person has HUS. These tests include kidney function, blood clotting factors, and blood counts. Treatments for HUS often include blood transfusions and kidney dialysis.

How is E. coli 0157:H7 spread?

The bacteria can be found in the intestines of animals and can live in the intestines of healthy cattle. Meat can become contaminated as a normal part of the slaughtering process. Eating raw or undercooked meat can cause infection. Bacteria present on a cow's udders or on equipment can get into raw milk.

Consumption of raw (unpasteurized) milk or eating products may also cause infection.

Other known sources of infection are consumption of sprouts, unpasteurized juice, dry cured salami, and water.

Bacteria in stools of infected persons can be passed from one person to another if hygiene or hand washing habits are inadequate. This type of spread is especially likely in young children who are not toilet trained. It is also likely that family members and playmates have a much higher risk of becoming infected. Careful attention to good hand washing and hygiene will help prevent others from getting infected.

The bacteria is usually cleared from the stool within a week after the diarrhea begins. In some children the bacteria may persist in stools for 2-4 weeks.

Special concerns with ground beef and E. coli 0157:H7

When meat is contaminated with E. coli, it usually occurs on the outside surface. When you cook a steak or roast, the outside of the meat is heated sufficiently so that pathogens on the surface are easily killed. Because ground meat is made by mixing, numerous small portions of the surface area (and potentially the bacteria) are spread throughout the product. Therefore it is important to cook the ground beef throughout so that none of the bacteria would survive. In addition, solid muscle meats that have been mechanically tenderized, injected or 'pinned' may have had surface bacteria pushed to internal parts of the product. Therefore, these products should also be thoroughly cooked to 160°, using a meat roasting thermometer.

Preventing Illness from E. coli 0157:H7

E. coli bacteria can survive both refrigeration and freezer storage. It is not known what level of E. coli causes infection but infective doses, the number of bacteria necessary to become ill, are considered to be low. For this reason, proper food handling and preparation techniques are essential. Use the following methods as controls against infection:

1. Cook all ground beef and hamburger thoroughly. Because ground beef can turn brown before disease causing bacteria are killed, use a digital instant read thermometer to ensure thorough cooking. Ground beef should be cooked until a thermometer inserted into several parts of the patty, including the thickest part reads at least 160°F. Persons who cook ground beef without using a thermometer can decrease their risk of illness by not eating ground beef patties that are still pink in the middle.
2. Wash hands with hot soapy water after contact with raw meat. Ensure good hygienic practices are followed after using the toilet and when changing diapers or assisting young children.
3. If eating out, send back any meat that does not appear to be thoroughly cooked. You may want to ask for a new bun and a clean plate too.
4. Avoid spreading harmful bacteria in your kitchen. During preparation, keep raw meat separate from ready-to-eat foods such as salad ingredients, other fruits or vegetables, bakery products, or meat products that have already been cooked. Wash counters, cutting boards, pans and utensils with hot soapy water after they touch raw meat. Wash meat thermometers after each use.
5. Be sure to use clean plates and utensils for cooked meats - don't use the same ones that were used for the raw meat.
6. Never thaw food on the counter or let it sit out of the refrigerator for more than two hours. It is safest to thaw foods in the refrigerator. If thawed in the microwave, continue the cooking process immediately.
7. Wash fruits and vegetables prior to use.
8. Drink only pasteurized milk, juice, or cider.
9. When shopping, make cold and refrigerated food selections one of your last purchases. Separate raw meat from ready-to-eat foods (lunch meats, produce, bakery items, etc). Ask the clerk to bag raw meats separately from other groceries. After leaving the store, get it home quickly. If necessary, pack perishables in an ice chest.
10. Promptly refrigerate or freeze these products at home. Refrigerators should be maintained at 40°F or below. Use refrigerated ground meat within 1-2 days; frozen meat should be used within 3-4 months for best quality. Store raw meats in the refrigerator so that juices cannot drip onto other foods.

Resources:

United States Department of Agriculture, Food Safety Inspection Service, Consumer Education and Information - Focus on Ground Beef.

Centers for Disease Control and Prevention, Division of Bacterial and Mycotic Diseases, - Escherichia coli 0157:H7.