



## *Escherichia coli* O157:H7

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*Escherichia coli* O157:H7 (*E. coli* O157:H7) is a foodborne pathogen that has caused many outbreaks in the United States (See Table Below). The bacterium was identified in 1977 and was first recognized as a cause of illness in 1982. *E. coli* O157:H7 fits into a group of bacteria called coliforms because it is a gram-negative, non-sporeforming, facultative anaerobic, rod-shaped microorganism that ferments lactose.

Selected *E. coli* O157:H7 outbreaks as recorded by the Centers for Disease Control

Date	MMWR	Outbreak Identification	No. Infected	Vehicle/Source
Feb. 5, 1993	Vol. 42/No. 4	Washington	230	Ground beef patties from restaurant
April 16, 1993	Vol. 42/No. 14	Jack in the Box in Western U.S.	655	Ground beef patties from restaurant
April 1, 1994	Vol. 43/No. 12	California	11	Fresh ground beef chubs from retail store
June 9, 1995	Vol. 44/No. 22	New Jersey	46	Ground beef patties
March 29, 1996	Vol. 45/No. 12	Georgia, Tennessee	10	Ground beef patties from restaurant
May 31, 1996	Vol. 45/No. 21	Illinois State Park	5	Lake water
Nov. 8, 1996	Vol. 45/No. 44	Odwalla Juice	45	Unpasteurized apple juice
Jan. 10, 1997	Vol. 46/No. 1	Connecticut, New York	67	Unpasteurized apple cider
Aug. 1, 1997	Vol. 46/No. 30	Sporadic cases	28	Ground beef patties from restaurants and retail stores
Aug. 15, 1997	Vol. 46/No. 32	Michigan, Virginia	108	Alfalfa sprouts
Aug. 22, 1997	Vol. 46/No. 33	Hudson Foods	15	Frozen ground beef patties
Sept. 17, 1999	Vol. 48/No. 36	Washington Co. Fair, New York	921	Unchlorinated water
Oct. 13, 2000	Vol. 49/No. 40	Wisconsin dairy	55	Fresh cheese curds
July 26, 2002	Vol. 51/No. 29	ConAgra Beef Co.	28	Ground beef from retail store

Healthy humans and animals harbor *E. coli* O157:H7 in their gastrointestinal tracts and it is found in fecal matter. Because *E. coli* O157:H7 is found in the intestinal tract, it can be spread by the consumption of food and water that have been contaminated with feces. Beef cattle are likely to contain feces and mud on their hide, and there is growing evidence that *E. coli* O157:H7 is more prevalent on the hides of cattle than was initially thought. This is of great concern because meat can become contaminated during the slaughter process from bacteria located on the hide. There have been no reported illnesses associated with whole muscle cuts and most infections have been associated with the consumption of raw or undercooked, contaminated ground beef. Ground beef is the major source of concern for *E. coli* O157:H7 because the microorganism is thoroughly mixed into beef when it is ground, whereas whole muscle cuts are only be contaminated on the surface. Illnesses associated with *E. coli* O157:H7 are not exclusive to beef products: alfalfa sprouts,

(over)



## *Escherichia coli* O157:H7, continued

salami, unpasteurized milk products, unpasteurized apple juice, and sewage-contaminated water have all had outbreaks associated with them.

*E. coli* O157:H7 causes hemorrhagic colitis that consists of severe bloody diarrhea and abdominal cramps, which typically lasts five to 10 days. However, some immunocompromised individuals, particularly children under five years of age and the elderly, may develop hemolytic uremic syndrome (HUS), which results in the destruction of red blood cells and ultimately kidney failure. Approximately two to seven percent of infections lead to this complication, and HUS is the principal cause of renal failure in children in the United States.

Prevention of infection from beef can be accomplished by cooking all ground beef and hamburger to an internal temperature of 160° F or by not eating ground beef that appears to be undercooked. In addition, some outbreaks have been associated with cross contamination of ready-to-eat food with raw beef. Therefore, it is essential that good hygiene practices are followed in commercial and home kitchens. To prevent infection from other food sources, drink only pasteurized milk, juice, or cider, wash fruits and vegetables thoroughly, and avoid consumption of sprouts by children under the age of five, the immunocompromised, and the elderly. Furthermore, drink only municipal water that has been treated with chlorine or other effective disinfectants, and avoid swallowing lake or pool water while swimming. Beef products, as with all foods, contain an inherent risk associated with consumption, however, proper handling and cooking can eliminate the likelihood of contracting an illness.