

***Escherichia coli (E. coli)***, is one of the main species of bacteria living in the lower intestines of mammals, known as gut flora. When located in the large intestine, it actually assists with waste processing, vitamin K production, and food absorption. Discovered in 1885 by Theodor Escherich, a German pediatrician and bacteriologist,[1] *E. coli* are abundant: the number of individual *E. coli* bacteria in the feces that a human defecates in one day averages between 100 billion and 10 trillion.[citation needed] However, the bacteria are not confined to this environment, and specimens have also been located, for example, on the edge of hot springs. The *E. coli* strain O157:H7 is one of hundreds of strains of the bacterium that causes illness in humans.[2]

As with all Gram-negative organisms, *E. coli* are unable to sporulate. Thus, treatments which kill all active bacteria, such as pasteurization or simple boiling, are effective for their eradication, without requiring the more rigorous sterilization which also deactivates spores.

As a result of their adaptation to mammalian intestines, *E. coli* grow best in vivo or at the higher temperatures characteristic of such an environment, rather than the cooler temperatures found in soil and other environments.

Fecal coliforms (sometimes faecal coliforms) are facultatively-anaerobic, rod-shaped, gram-negative, non-sporulating bacteria. They are capable of growth in the presence of bile salts or similar surface agents, oxidase negative, and produce acid and gas from lactose within 48 hours at  $44 \pm 0.5^\circ\text{C}$ . The fecal coliform assay should only be used to assess the presence of fecal matter in situations where fecal coliforms of non-fecal origin are not commonly encountered.[1]

Fecal coliforms include the genera that originate in feces; *Escherichia* as well as genera that are not of fecal origin; *Enterobacter*, *Klebsiella*, and *Citrobacter*. The assay is intended to be an indicator of fecal contamination, or more specifically *E. coli* which is an indicator microorganism for other pathogens that may be present in feces. As recently as April 2006, many official websites including that of the Environmental Protection Agency failed to address the fact that presence of fecal coliforms does not necessarily indicate the presence of feces.[1]