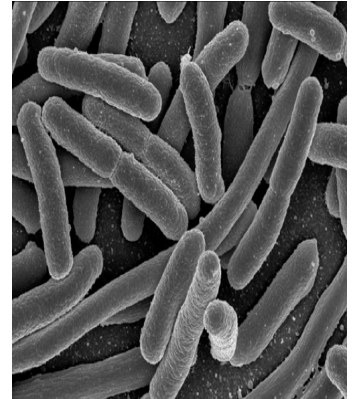


## The Fact Sheet (series no.17) – E.Coli Case Studies Escherichia Coli 0157

Escherichia coli is a bacterium that forms part of the human intestinal flora. Despite its occurrence as a normal harmless organism in the intestine, certain types of E. coli have been shown to produce diarrhoea in humans. Several different groups of E. coli are recognised on the basis of different mechanisms of disease production.

The most important of these groups in terms of the severity of the disease, are a group known as verotoxin producing E. coli, usually referred to as VTEC for short. VTEC are so named because they produce potent toxins known as verotoxins which are responsible for the production of diarrhoea. E. coli can be divided into over 160 different types known as serotypes, one of these serotypes E. coli 0157 is now recognised as the most important of the VTEC, it is a cause of major outbreaks of diarrhoea disease and can cause death particularly in children.



Verocytotoxin producing Escherichia coli 0157 were first identified as a human pathogen in 1982 following two outbreaks of diarrhoeal illness associated with the consumption of hamburgers from a fast food chain. E. coli 0157 causes particular concern is now considered a major public health problem because of the serious complication of the infection. The organism is associated with illness characterised by severe bloody diarrhoea. Between 2 and 7% of cases go on to develop haemolytic uraemic syndrome (HUS) which is characterised by haemolytic anaemia and renal failure. The incidence of HUS is higher in children than in adults and the syndrome carries a fatality rate of up to 5%. In the UK HUS is the commonest cause of renal failure in children.

Outbreaks of E. coli 0157 infection have been documented in many countries including the United Kingdom. The main sources of infection are the ingestion of undercooked contaminated beef products, usually hamburgers. However, other documented sources of infection include water, both potable and recreational, unpasteurised milk, yoghurt, zoonotic spread, and person to person spread. The incidence of infection with this organism varies within the UK. The highest annual incidence is in Scotland, 4,73 per 100,000 population compared with 0.8/100,000 in England and Wales. In the UK between 1992 and 1994, 1266 laboratory isolations were reported to the Central Public Health Laboratory. The majority of these cases were sporadic infections although there were 18 outbreaks affecting 159 people; 40% of these infected patients were admitted to hospital 18% developed HUS and 2.5% died. Of the 18 outbreaks, 13 were associated with the consumption of contaminated food. However a recent outbreak in Japan infected over 6000 people with at least 7 deaths and over 100 cases of HUS almost all in young children.

Infection with E. coli 0157 is clearly a major Public Health problem. There is evidence that incidence of infection is increasing, irrespective of greater awareness of the pathogen and infection is associated with considerable morbidity and mortality, particularly amongst children. The importance of infection with this organism has prompted recent government action. A working group has issued recommendations for the surveillance of infection in humans and farm animals, evaluation of procedures for testing food and environmental samples, and implementation of a monitoring system (Hazard Analysis and Critical Control Points) for the storage, handling and heat treatment of raw foodstuffs. In the USA a consensus panel on E. coli 0157 infection has issued a similar statement. There is considerable research work being carried out investigating such factors as how the organism gets into food, are some people more susceptible than others, how is disease produced and how it can be cured.

In conclusion E. coli 0157 is the most important of a group of E. coli called verotoxin-producing E-coli or VTEC. It causes diarrhoea illness in humans and is often associated with outbreaks of infection. Infection in children can be severe leading to kidney failure and death. The incidence of infection is increasing in the UK and there are greater demands on clinical laboratories to detect infections in patients with diarrhoea disease and for food microbiologists to ensure that food is free of these organisms. It can be stopped however, If you wish to protect yourself and your family from a wide range of undesirable substances commonly found in tap water, you should select point-of-use ceramic water filtration.

**For advice call us: 020 8539 4707**