

Food pathogens

What is food poisoning?

- Foodborne illness is an infection or poisoning caused by a bacterium, virus, parasite, or chemical transmitted by food or water.
- In Scotland, it is estimated there are 43,000 cases of foodborne illness annually, with 5,800 GP presentations and 500 hospital admissions.
- FSS works closely with the Food Standards Agency (FSA) and Scottish partners such as Health Protection Scotland (HPS) to target the bacterial and viral pathogens which cause the highest number of cases of foodborne illness.
- The top five pathogens in Scotland are: campylobacter, salmonella, listeria, E. coli and norovirus.
- Bacteria are tiny organisms you can only see under a microscope. They come in many shapes and sizes, but even the biggest ones are very small – only 10 micrometres long – that's just 10 millionths of a metre.
- Bacteria are living cells and can multiply very quickly inside your body. If this happens they can release poisons or toxins that can make you feel very ill.
- Viruses, such as Norovirus are infective agents that typically consist of a nucleic acid molecule in a protein coat, and are too small to be seen by light microscopy. They multiply only within the living cells of a host, e.g an animal or human.
- Illness from foodborne pathogens is preventable by taking care and preparing food safely according to the 'Four Cs': cleaning, cooking, chilling and cross contamination.

Campylobacter

- Campylobacter is the most common form of foodborne illness in Scotland (a situation which is similar to the UK and most of the developed world), with around 6000 cases of infection in the Scotland every year.
- Illness usually lasts around a week and is characterised by diarrhoea, abdominal pain and fever, and, in some cases, nausea and vomiting. For some patients, campylobacter can result in much more serious post infection illness, including irritable bowel syndrome (IBS), reactive arthritis and, in rare cases, Guillain-Barré syndrome – a serious condition of the nervous system which causes paralysis. At its worst, campylobacter can kill.
- Infection is caused by the handling of raw meat, particularly poultry, or by eating chicken which hasn't been cooked properly.
- In Scotland, 55% -75% of Campylobacter poisoning cases can be linked to chicken sources.
- Proper cooking of food can prevent campylobacter poisoning. Chicken and chicken products should be cooked thoroughly until steaming hot (the core temperature should reach 75°C), there is no pink meat left and the juices run clear.

Salmonella

- Salmonella is the second most commonly reported cause of bacterial infectious intestinal disease in Scotland after campylobacter.
- Common symptoms include diarrhoea, stomach cramps, nausea, fever and occasionally vomiting. These symptoms usually last 4-7 days and clear up without treatment.
- Infection can be through a number of routes including contaminated food, environmental exposure, or transmission from infected animals. It is a risk in raw meat, poultry, unpasteurised milk and dairy products.
- During the late 1990s, when vaccination against Salmonella Enteritidis was introduced in the poultry industry, there was a 37% decrease in the number of cases of salmonella in Scotland, and in following years the numbers have continued to decline annually. However it remains an important pathogen and is responsible for a large number of outbreaks each year.
- Proper cooking of food and following food safety practices can prevent salmonella poisoning.

Listeria

- The public health importance of Listeria monocytogenes as a gastro-intestinal pathogen arises not from the number of reported cases, which are relatively low (10-20 cases annually in Scotland), but rather due to the severity of infection and high mortality.
- Infection with Listeria monocytogenes causes influenza like illness, septicaemia or a meningo-encephalitis.
- Pregnant women, newborn infants, the elderly and individuals with weakened immune systems are most at risk.
- Listeria can present a risk in chilled ready-to-eat foods such as cooked sliced meats, types of soft cheese, pate, smoked fish and pre-packed sandwiches.
- Listeria can continue to grow at even at cold temperatures, so it's important to keep refrigerators below 5°C and never eat food that has passed its use by date.

E. coli

- There are over 160 cases of E. coli O157 each year in Scotland.
- E. coli infection is an important public health challenge because it continues to cause outbreaks of infection, severe illness and, in some cases, death, particularly among the very young.
- Infection may not show symptoms or cause a spectrum of illness ranging from mild diarrhoea, bloody diarrhoea and haemorrhagic colitis. Haemolytic uraemic syndrome (HUS) can sometimes occur as a result of E. coli infection and this may lead to kidney failure, particularly in those under 16 or over 60 years.
- E. coli infection occurs when humans ingest organisms originating from animal faeces, directly by contact with grazing animals, their environments or indirectly by contaminated food or water.
- E. coli poisoning can be caused by cross contamination from faeces or raw meat or undercooking of raw meat, particularly products like minced beef and burgers.
- E. coli bacteria are killed by cooking food thoroughly and ensuring the core temperature reaches 75°C.

Norovirus

- Norovirus is also known as the 'winter vomiting bug', however it can occur at any time of year.
- There were 1390 reported cases in Scotland 2015.
- Infection usually causes a mild, short lived illness (which usually lasts 12-60 hours) characterised by sudden onset nausea followed by projectile vomiting and diarrhoea. Dehydration may occur and hospital treatment is sometimes necessary, particularly for the young and elderly.
- It is very infectious which means it can easily be passed on from person-to-person and outbreaks are common in semi-closed settings including care homes, schools, nurseries, hotels and cruise ships.
- Norovirus infection can also be caused by contact with contaminated environments or by eating food which has been grown in or treated with contaminated water (e.g. shellfish or fresh produce).
- Prevent infection by washing hands thoroughly before and after using the toilet and before and after preparing food.