

Pathogenic Bacteria

Known name	Bacillus cereus	Campylobacter	Clostridium botulinum	Clostridium perfringens	Escherichia coli O157:H7	Listeria monocytogenes	Staphylococcus aureus	Salmonella
Scientific classification	Bacteria > Firmicutes > Bacilli > Bacillales > Bacillaceae > Bacillus > cereus	Bacteria > Proteobacteria > Epsilon Proteobacteria > Campylobacterales > Campylobacteraceae > Campylobacter	Bacteria > Firmicutes > Clostridia > Clostridiales > Clostridiaceae > Clostridium	Bacteria > Firmicutes > Clostridia > Clostridiales > Clostridiaceae > Clostridium	Eubacteria > Proteobacteria > Gammaproteobacteria > Enterobacteriales > Enterobacteriaceae > Escherichia > E.coli	Bacteria > Firmicutes > Bacilli > Bacillales > Listeriaceae	Bacteria > Eubacteria > Firmicutes > Bacilli > Bacillales > Staphylococcaceae > Staphylococcus > S.aureus	Bacteria > Gamma Proteobacteria > Enterobacteriales > Enterobacteriaceae > Salmonella
Commonly found	Soil, water	Chicken, cows, untreated water . Also found in birds, flies	Soil, marine environment, intestines of fish and mammals, gills and viscera of crabs and other shellfish	Human and other warm-blooded animal intestine and faeces, soil, widely distributed within the environment	Water, soil, intestines of warm-blooded animals, especially poultry and humans	Soil, stream water, swage, plants, food, human and animal faeces	Air, dust, water, human faeces, skin, nose, sores, pimples, poultry, cows, pigs	Intestines of warm and cold-blooded animals, especially poultry and humans, water, soil, insects, faeces, surfaces
Temperature danger zone	Between 30°C and 50°C, though rarely known to grown between 4°C and 5°C	Between 32°C and 45°C	Between 3.3°C to 50°C	Between 15°C to 50°C	Between 7°C to 46°C	Between 4°C and 37°C (can grow under refrigeration)	Between 7°C and 48°C	Between 7°C and 47°C
Acidity level (pH)	Between 4.3 and 9.3	Between 5.5 and 8.0, though one strain can grow between 4.9 and 9.5	Between 4.6 and 9.0	Between 5.0 and 8.0	Between 4.4 and 10.0	Between 4.4 and 9.6	Between 4.0 and 10.0	Between 4.0 and 9.5
Minimum water activity	Minimum 0.91	Minimum 0.98	Minimum 0.94	Minimum 0.93	Minimum 0.95	Minimum 0.90, though rare records exist for lower water activities	Minimum 0.83	Minimum 0.96
Type of food poisoning	Toxic	Toxin	Toxic	Toxic	Toxic	Infective	Toxic	Infective
Food threats direct	- Meats, milk, vegetables, fish - Rice, potato, pasta, cheese, sauces, soups	- Frequently raw chicken, raw milk.	- Sausages, meat products, canned vegetables, seafood products, honey - Home cooking inadequately processed	- Meats, meat products, gravy - Temperature abuse of prepared foods	Meats, leafy vegetables, sprouts, unpasteurised dairy and juice, undercooked meats,	- Raw and cooked vegetables, meats, dairy products - Ready to eat foods, soft cheeses	- Everything L Red and white meats, salads, eggs, tuna, potato, pasta, bakery products, cream filled products, chocolate, sandwiches, dairy products - Food items that require considerable food handling and are kept at slight elevated temperature control	- Eggs, meat, specifically poultry, dairy - Soiled-based fruits vegetables and (due to possible contaminated soil or water)
Food threats cross contaminant	- Unclean surfaces - Poor personnel hygiene	- Unclean surfaces - Using same utensils for cooked and raw foods - Poor personnel hygiene	- Unclean surfaces - Poor personnel hygiene	- Unclean surfaces - Poor personnel hygiene	- Unclean surfaces - Poor personnel hygiene	- Unclean surfaces - Poor personnel hygiene	- Contaminated people - Poor personnel hygiene	- Unclean surfaces - Poor personnel hygiene

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Does cooking kill it?	If cooked over 100°C, otherwise bacteria is protected within spores	Yes, if cooked at the correct internal temperature but foods can be re-infected through cross contamination. Proper cooking of chicken, pasteurising of milk and chlorinating potable water will kill the bacteria	If cooked over 80°C for more than ten minutes, otherwise bacteria is protected within spores	No, a small number of the bacteria can be present after cooking and multiply to food poison levels during cool down and storage of prepared foods	Yes, if cooked at the correct internal temperature but foods can be re-infected through cross contamination	Yes, if cooked at the correct internal temperature but foods can be re-infected through cross contamination	Yes, if cooked at the correct internal temperature but foods can be re-infected through cross contamination	Yes, if cooked at the correct internal temperature but foods can be re-infected through cross contamination
High risk warning groups	Everyone, particularly sensitive population (children, elderly, sick)	- Children under the age of 5 - Sensitive population (children, elderly, sick)	Sensitive population (children, elderly, sick)	Sensitive population (children, elderly, sick)	- Children and the elderly (is known to have a high mortality rate) - Everyone is at risk	- Pregnant women and sensitive population (children, elderly, sick) - People with weakened immune systems	Sensitive population (children, elderly, sick)	Sensitive population (children, elderly, sick)
Infection to symptom	Varies between 30 minutes to 14 hours	Between 2 to 7 days, though Guillain-Barre syndrome can occur between	Between 18 to 36 hours	Between 8 to 22 hours	Between 17 to 72 hours	Varies between 8 to 90 days	Between 1 to 6 hours	Between 8 to 72 hours
Infective dosage	10 ⁵	400 to 500 cells	Minute amounts	10 ⁵	As low as only 10 organisms	Unknown as rare cases involved minute amounts	1 microgram	10 ⁵ , though rare cases are known for only 1 to 10 cells
Illness symptoms	Severe nausea, vomiting, diarrhoea	Diarrhoea (can eventuate to bleeding), fever, abdominal pain, nausea, headache, muscle pain	Weakness, fatigue, dizziness followed by blurred vision and progressive difficulty in speaking and swallowing followed by weakening of the respiratory muscles	Intense abdominal cramps and diarrhoea	Severe bloody diarrhoea, dysentery, bloody stools, HUS Haemolytic uraemic syndrome, TTP thrombotic thrombocytopenic purpura,	Flu-like, vomiting, severe headaches, fever, muscle ache, stiffness, cramps, abdominal pain, nausea, diarrhoea, eye infections, constipation	- Gastroenteritis: abdominal pains, nausea, diarrhoea, mild fever, vomiting, headaches - Nausea, vomiting, diarrhoea, abdominal cramping, headaches, muscle cramping	Gastroenteritis: abdominal pains, nausea, diarrhoea, mild fever, vomiting, headaches though reactive arthritis and Reiter's syndrome may occur in a small percentage of patients between 3 to 4 weeks after inflammation
Illness duration	Between 6 to 24 hours	Between 7 to 10 days, though 25% of cases are known to relapse	From weeks to years, dependent upon severity of poisoning	Less than 24 hours though known to persist for 1 to 2 weeks	Between 5 to 10 days	Generally 12 hours	Between 2 to 5 days	Between 2 to 5 days
Treatment	Drink plenty of water to avoid dehydration from diarrhoea and vomiting	Drink plenty of water to avoid dehydration from diarrhoea and vomiting. Antibiotic erythromycin can assist in reducing timeframe of illness	Drink plenty of water to avoid dehydration from diarrhoea and vomiting	Drink plenty of water to avoid dehydration from diarrhoea and vomiting	Normal cases: drink plenty of water to avoid dehydration from diarrhoea. Close monitoring required; if signs of HUS, intensive care required asap to avoid death	Antibiotics	Drink plenty of water to avoid dehydration from diarrhoea and vomiting	Normal cases: drink plenty of water to avoid dehydration from vomiting and diarrhoea. Severe cases require monitoring, possible intravenous fluids and antibiotics