

MICROBIOLOGY BASICS



Bacteria are one of the basic forms of life and are single celled organisms. Bacteria can be found everywhere – on people, animals, food and in soil and water. Anyone can become ill from contaminated food, but some people are more at risk, including babies, the elderly, pregnant women and those that have a weakened immunity such as cancer patients or people living with HIV. Bacteria are too small to be seen without the aid of the microscope unless they have formed slime, for instance on meat, or are present in large numbers in a colony.

Types of bacteria

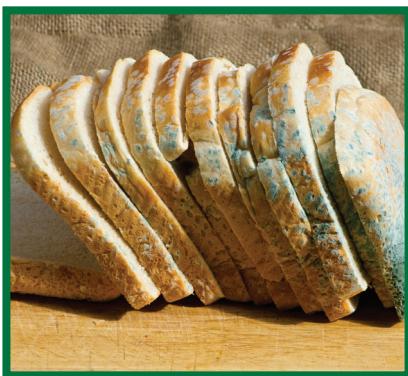
Most bacteria are harmless, while some are used to our advantage, for instance, in the manufacturing of cheese and yoghurt. However, there are two categories of bacteria which create major food problems in the food industry. They are spoilage bacteria and pathogenic bacteria.

Spoilage bacteria

Food starts to decompose as soon as it is harvested or killed, so storage methods and conditions should aim to reduce the rate of decomposition to safeguard the nutritional value, appearance, taste and fitness of the food.

Once plant or animal tissue has died, there is no longer any protection from the attack of bacteria, moulds and yeasts. The rate of decomposition depends on the type of food and/or the way it is handled. The food may be considered spoilt when it is undesirable to eat. When this is may depend upon individual taste – some people like mature cheese, very ripe fruit or game that has been hung for some time.

Not all the changes that take place in food after cropping or slaughtering are undesirable. For example, the conversion of sugars to alcohol enables wine and beer to be made, while other changes impair the acceptability of food and some are dangerous to health.



Common indications of spoilage include change to the food's usual:

- Appearance - for example, discolouration or slime
- Smell
- Texture or
- Taste

Spoilage of food may be caused by:

- Decomposition – due to enzymes and micro-organisms including bacteria, moulds and yeast.
- Pest infection
- Physical damage, including freezer burn or oxidation
- Chemical contamination

Most food spoilage is caused by mould. A network of fine strands, called mycelium, which is formed often visible on foods, particularly when they have been stored in damp conditions.

The activities of enzymes continue after cropping or slaughtering unless the enzymes are inactivated – for instance, by blanching vegetables. (Enzymes are often used deliberately in the food industry to produce special effects, such as tenderising meats.)

The storage of food

While food is stored, it should be protected from taint and contamination. Bacteria and enzymes are inhibited by high and low temperature. Although enzymes are inhibited by freezing, many remain active at -2°C, so vegetables are blanched before freezing to kill enzymes.

Pathogenic bacteria:

These bacteria are responsible for causing illness especially when large numbers of them are present on food. They rarely alter the appearance, taste or smell of food. These bacteria are measured in micrometres (or microns) expressed as um. One um is equal to one thousandth of a millimetre. A bacterium of the *Salmonella* family is just 3um long.

Bacteria also come in a variety of shapes:



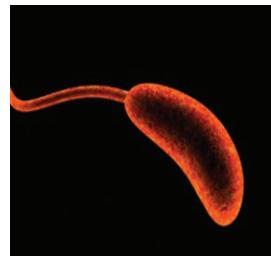
Cocci are spherical. Some such as *Streptococcus faecalis*, form chains. Others, such as *Staphylococcus aureus*, form clusters that look like a little bunch of grapes.



Bacilli, such as the *Salmonella* species, are rod-shaped.



Spirochaetes, such as *Leptospira interorgan*, which can cause Weil's disease in humans, are spiral shaped.



Vibrio, such as *Vibrio cholerae*, are comma-shaped.

Spores

Two types of bacteria, Bacilli and Clostridia, in the food industry Clostridium botulinum and Bacillus cereus, can produce spores capable of surviving adverse conditions including dehydration, disinfection and heat. The spores can remain dormant in soil or dust for long periods and temperatures above 100°C may be required to kill them.

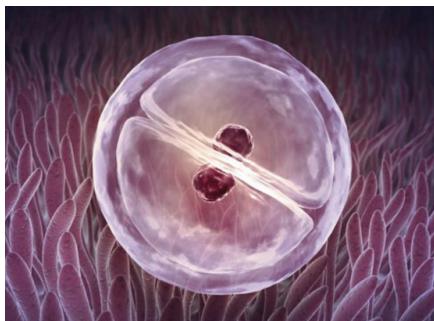
Toxins

Some bacteria produce poisonous substances, called toxins, in food. Toxins that cause any kind of gastro-enteritis are referred to as enterotoxins. This general term covers two specific types of toxin:

Exotoxins – produced during the multiplication of bacteria in food.

Endotoxins – which form part of the cell wall and are released on the death of the bacteria.

Exotoxins can be heat resistant. Examples of bacteria that produce exotoxins are Bacillus cereus and Staphylococcus aureus. Bacteria that produce endotoxins include Clostridium perfringens. These are also toxins that affect the central nervous system and may cause death. Clostridium botulinum produces such a toxin – a neurotoxin.



Reproduction or Binary Fission

Bacteria multiply by a process of binary fission, non-sexually dividing in two. The correct conditions must be available before this can happen. Following division, each cell grows to maturity and divides itself. The time between each division (the generation time) varies but is on average 10 – 20 minutes. When binary fission is complete, there will be two separate, identical bacteria.

Conditions required for multiplication

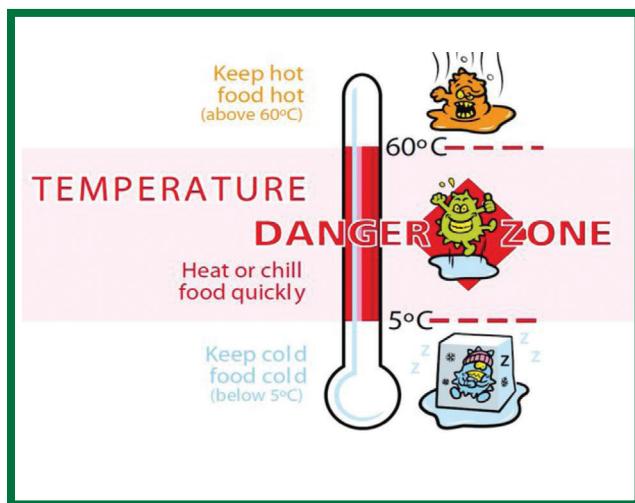
Nutrients

Bacteria need similar nutrients to humans. High protein foods, such as meat, meat products, poultry, eggs, milk, milk products and seafood provide these. Growth is repressed by high concentrations of salt, sugar, acid or fat.

Temperature

Bacteria multiply at temperatures between 5°C - 60°C, the range of temperatures known as the danger zone. Bacteria multiply more slowly if it is cold and become dormant in very cold conditions of -18°C. At temperatures above 60°C most food poisoning bacteria die or create spores if they can.

The average ideal temperature for rapid bacterial multiplication is 37°C (body temperature). However, it is always important to remember that different bacteria can multiply at different minimum and maximum temperatures and each bacterium has an optimum temperature for reproduction



Time

All bacteria need time to multiply in the right conditions. Bacteria divide into two every 10 - 20 minutes by a process of binary fission.

Moisture

Bacteria need moisture to stay alive. Dry products are therefore unsuitable for bacterial multiplication, but spore forming bacteria can survive dehydration. The moisture available to bacteria from food is usually measured as water activity, expressed as aw. The aw of pure water is 1.00, and bacteria generally need 0.95 or above to stay alive.

pH

The pH scale measures how acid or alkaline a substance is. A pH value of 7 is neutral: water is neutral. Acidic foods have a pH below 7, while alkaline foods have a pH above 7. Bacteria prefer a pH of 4.5 to 7.

Atmosphere

Most bacteria require oxygen to grow but some can multiply in low levels of oxygen or do not need oxygen at all:

Aerobes need oxygen e.g. *Bacillus cereus*.

Anaerobes grow without oxygen and tend to cause problems in canning e.g. *Clostridium botulinum*.

Facultative anaerobes grow with or without oxygen – for example, *Salmonella* species and *Staphylococcus aureus*.

Destruction of bacteria

Bacteria may be killed by:

Chemicals – a wide range of additives, including salt, sugar, nitrates and sulphur dioxide are available to prevent bacterial spoilage.

Heat – temperature above 60°C kills bacteria.

Irradiation – which is legal only for certain foods.

Bacterial food poisoning and food borne disease



Bacterial food poisoning is an acute disturbance of the gastro-intestinal tract resulting in abdominal pain, with or without diarrhoea or vomiting. The illness results from consumption of food which has been contaminated by specific pathogenic bacteria or their toxins.

Food borne diseases are often associated with contaminated water sources as well as contaminated food and are responsible for many outbreaks of serious illness. In food-borne disease, the food acts as a vehicle for the pathogen which does not have to multiply in the food before causing illness. Instead, the pathogen multiplies in the person who has eaten the food.

Non-bacterial food poisoning

Bacteria are the main cause of food poisoning, but illness can also be caused by chemical, metal, poisonous plants and fish, viruses and mycotoxins.

Chemical food poisoning



Chemical food poisoning is rare but when it does occur the consequences can be serious. The symptoms may be acute or chronic. Acute symptoms which have an onset of less than one hour, include vomiting, diarrhoea and a burning sensation in the chest, neck and abdomen. With chronic poisoning the chemical builds up in the body over a period, causing a variety of problems such as cancer and damage to the nervous system.

The causes of chemical food poisoning, which may be due to negligence or deliberate fraud, include:

- Excessive quantities of pesticide sprayed onto fruit and vegetables as they grow.
- Misuse of antibiotics during rearing of animals.
- Environmental contamination of soil and water.
- Misuse of cleaning materials at food premises.
- Incorrect storage of weed killer or pesticides – for example – storage of chemicals near food or feed or storage of chemicals in unlabelled food containers.
- Food fraud - for example, olive oil sold in Spain was contaminated by a toxic substance and Austrian wine was contaminated by anti-freeze type chemicals.

Metal food poisoning

Metals can enter the human food chain from the soil if they are absorbed by animals as they graze or by vegetables, fruit and cereals as they grow. Fish caught in polluted waters may be contaminated by metals. Problems may also occur in food, especially very acidic food, when it encounters metals such as:

- Antimony - typically from the enamel coating of cooking pots.
- Cadmium - from cookers, refrigerators shelves and some types of earthware pots and dishes.
- Copper - usually from cooking utensils and some instances where copper pipes have contaminated cold soft drinks or milk dispensed by machines.
- Lead - from some type of earthware, lead crystals or ceramics.
- Tin and iron - usually found in cans.
- Zinc - typically from galvanised equipment.

Plant and fish food poisoning

Plant poisoning

Across the globe the main poisoning caused by plants is:

- Poisonous plants and fungi eaten accidentally - such as poisonous mushrooms, rhubarb leaves and plants including deadly nightshade and members of the nightshade family, such as bittersweet.
- Incorrectly processed beans, such as red kidney beans and haricot beans. The problem occurs when the bean is not cooked at a high enough temperature to destroy the naturally occurring haemagglutinin which causes the poisoning. All beans need to be properly cooked and the use of canned kidney beans, which have already been processed, is recommended.

Poisonous fish

• Scombrotoxic fish poisoning

This illness is caused by toxins produced in some dark fleshed fish, such as mackerel, tuna and sardines, during storage. Refrigerating the fish as soon as it is caught reduces this problem, but once spoilage has occurred, the toxin cannot be destroyed whether the fish is smoked, soured or canned. The typical average onset period varies from 10 minutes to three hours. The symptoms which last up to eight hours, include headaches, nausea, vomiting, abdominal pain, diarrhoea, rashes and a burning sensation in the mouth.

• Ciguatera poisoning

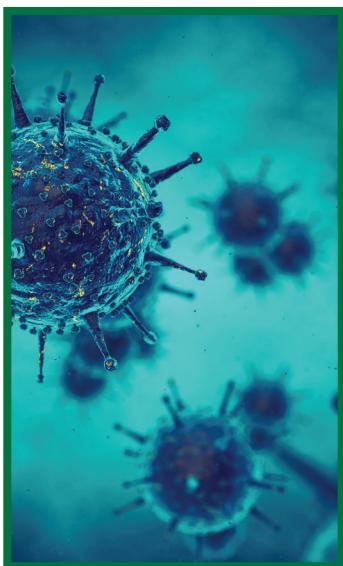
This life-threatening illness arises from eating reef-dwelling fish, such as barracudas, sea basses, groupers and eels, which have fed on types of marine algae (on other algae-eating marine creatures) that produce a toxin. The fish are unaffected by the toxin but about 300 varieties of fish caught in the Pacific and Caribbean can poison humans. The symptoms include sickness, diarrhoea, throat and respiratory problems and may be fatal. The onset time is one to six hours.

• Paralytic shellfish poisoning and diarrhetic shellfish poisoning

The sources of these potentially fatal illnesses are mussels and other bivalve molluscs which have fed on plankton that produce neurotoxins. The toxins can survive cooking. Symptoms of paralytic shellfish poisoning appear immediately and progress within 12 hours to numbness of the mouth, the neck, arms and legs, to respiratory paralysis which often leads to death. Diarrhetic shellfish poisoning may occur in a similar manner, but symptoms include diarrhoea and vomiting which last only a few days.



Viruses



Outbreaks of gastro-intestinal illness are increasingly being attributed to these microscopic pathogens. They are a result of a small, round structured virus, of which the Norwalk virus is a common example. Typical symptoms include vomiting, diarrhoea and abdominal pain. (Faecal contamination by a carrier may be responsible and the infective dose is small). Viral carriers have contaminated a wide variety of foods, and shellfish harvested in sewage contaminated water have been associated with viral food poisoning even when they have been correctly cleaned before consumption.

Unlike food poisoning bacteria, which need certain types of food to thrive, viruses do not depend upon any kind of food for their survival. This means that all food is susceptible to contamination by viruses. It is only after a virus has been eaten that it can multiply, and it does so in human tissue. A typical incubation period is 24 - 48 hours with symptoms lasting 24 - 48 hours. Person to person spread is common while people portray symptoms such as vomiting or diarrhoea. Secondary cases frequently occur among close family contacts.

Mycotoxins

These poisons are produced by certain types of mould, such as Aspergillus, which grow on food. They may cause vomiting and diarrhoea or may be carcinogenic (cancer causing). Foods that have been contaminated by mycotoxins include cereals, nuts, apple juice, herbs, spices, milk and milk powder.



A note about food Allergens:

A food allergen is an identifiable immunological response to food or food additives. There may be some symptoms, such as vomiting and diarrhoea that are like those of food poisoning. However, food allergens should not be confused with any food borne illness.

Other symptoms of food allergies may include a migraine, difficulty in breathing, collapse and unconsciousness. Various foods are known to trigger an allergic response in certain individuals for example, gluten, milk, shellfish, food colourants and nuts.

Bacillus cereus



Source

Bacillus cereus is an aerobic, spore-forming bacteria that produces an exotoxin.

Uncooked rice can contain spores and endospores of Bacillus cereus. The spores can survive when rice is cooked. If rice is left standing at room temperature, the bacteria produces spores. Bacillus cereus is responsible for a minority of foodborne illnesses. Bacillus cereus foodborne illnesses occur due to the survival of the bacterial endospores when food is improperly cooked. Cooking temperatures less than or equal to 100°C (212°F) allow some Bacillus cereus spores to survive.

Food commonly involved

The main source is found in raw plant foods such as rice, potatoes, peas, beans and spices. Also found in soya sauce and products containing cornflour, such as vanilla slices.

Symptoms

The estimated onset time is 1 - 5 hours after eating contaminated food. Symptoms include diarrhoea, abdominal pain, nausea and vomiting. The duration can be up to 24 hours.

Control measures

- ✓ Thorough cooking and rapid cooling of food. Try to only cook the quantity of rice needed. If large volumes of rice are cooked, then rapid cooling is required. Never reheat rice more than once.
- ✓ Best practice is to keep cooked rice in the fridge (but for no more than one day) before reheating.
- ✓ Storage at correct temperatures.
- ✓ Avoidance of re-heating where possible.
- ✓ Prevent cross-contamination.
- ✓ Food handlers to maintain a high standard of personal hygiene, especially hand washing.
- ✓ Use of approved cleaning chemicals.

Clostridium botulinum



Source

Clostridium botulinum is an anaerobic, gram-positive, rod-shaped, spore-forming bacteria. Clostridium botulinum is found in soil and untreated water. It produces spores that survive in improperly preserved or canned food, where they produce a toxin. The spores can survive cooking and other processes such as canning. **Normal thorough cooking (pasteurisation)** at 70°C for 2min or equivalent will kill Clostridium botulinum bacteria but not its spores. To kill the spores of Clostridium botulinum a sterilisation process equivalent to 121°C for 3 min is required. The botulinum toxin itself is inactivated (denatured) rapidly at temperatures greater than 80°C.

Food commonly involved

The source of foodborne botulism is often home-canned foods that are low in acid, such as fruits, vegetables and fish. However, the disease has also occurred from spicy peppers (chillies), foil-wrapped baked potatoes and oil infused with garlic. Other products to look out for are canned foods including: vegetables, meat, fish (tuna, salmon and smoked fish) and soup. Vacuum packed meat, bottled vegetables and herbs in oil.

Symptoms

The estimated onset time is 12 - 36 hours after eating contaminated food. Symptoms include fatigue, headache and diarrhoea at first followed by (Botulism) weakness, double vision, vertigo, difficulty swallowing or speaking, dry mouth, drooping eyelids, constipation and paralysis. Death occurs within 8 days of the onset of symptoms unless an anti-toxin is given.

Control measures

- ✓ High standards achieved in the preservation of food, especially canning, bottling and vacuum packing.
- ✓ Avoiding eating raw and fermented fish.
- ✓ Inspect cans and their contents before use and discard damaged cans or unsatisfactory contents.
- ✓ Beware of dented/rusted cans.
- ✓ Use of approved cleaning chemicals.

Clostridium perfringens



Source

Clostridium perfringens are rod-shaped anaerobic bacteria which form spores and an endotoxin. Clostridium perfringens can survive high temperatures. During cooling and holding of food at temperatures from 12°C – 60°C the bacteria grows. It can grow very rapidly between 43°C – 47°C. If the food is served without reheating to kill the bacteria, live bacteria may be eaten. The bacteria produce a toxin inside the intestine that causes illness. The bacteria can exist as a cell in the dormant spore form in food.

Food commonly involved

Raw and cooked meat products such as stews, casseroles and gravy. Poultry, prepared foods and vegetables such as potatoes and carrots.

Symptoms

Onset time is 8-24 hours after eating contaminated food. Symptoms include abdominal pain and stomach cramps followed by diarrhoea. Nausea is also a common symptom, while vomiting is unusual. The illness can be fatal to infants, young children and the elderly.

Bacteria grow rapidly in meat that is cooked slowly or in cooked meat that is stored at an ambient temperature. Spores form in adverse conditions such as high temperatures. Once conditions are more favourable, the spores regenerate into bacteria. Toxins are released when the bacteria die.

Control measures

- ✓ Strict temperature control
- ✓ Cut meat into small joints or portions before cooking.
- ✓ Cool hot food rapidly.
- ✓ Cook and keep food at the correct temperature.
- ✓ Refrigerate leftovers and reheat them properly.
- ✓ Use of approved cleaning chemicals.
- ✓ Separation of raw and cooked foods.
- ✓ Regular removal of all dirt from food areas.
- ✓ Careful washing of vegetables.
- ✓ Food handlers to maintain high standards of personal hygiene.

Escherichia coli (E. coli) and E.coli O157:H7



Source

E. coli bacteria normally live in the intestines of people and animals. Most E. coli are harmless and make up an important part of a healthy human intestinal tract. However, some E. coli are pathogenic causing illness outside of the intestinal tract. The harmful strain can cause food poisoning and is responsible for 'travellers' diarrhoea. A strain known as E. coli O157:H7 produces an extremely serious toxin which causes food poisoning in humans and may result in death.

The presence of E. coli in food is generally an indicator of possible faecal (faeces) contamination. This occurrence in high numbers may indicate poor hygiene handling and/or inadequate storage. E. coli is aerobic, rod shaped and destroyed at 70°C and above.

Food commonly involved

Raw and undercooked ground meat products, undercooked beef burgers, gravy, raw milk, vegetables grown in cow manure, contaminated raw vegetables and sprouts and fruit juice that is not pasteurised.

Symptoms

E. coli O157:H7 infection typically begins 12-24 hours after eating contaminated food however symptoms can also appear 3 to 4 days after exposure to the bacteria.

Symptoms usually include abdominal pain, chills, fever, watery diarrhoea (which can result in dehydration) and vomiting. The more severe consequences can cause kidney failure and even death. People with mild symptoms usually recover on their own without treatment. Antibiotics are not helpful for treating E. coli O157:H7 infections.

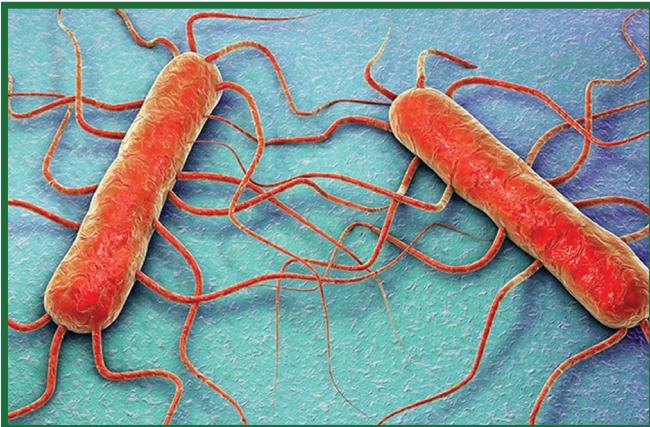
For most people, treatment includes: rest and fluids to help prevent dehydration and fatigue.

Control measures

- ✓ Separation of raw and high-risk foods and different work areas to prevent cross contaminations.
- ✓ Adequate temperature control.
- ✓ Food handlers to maintain a high standard of personal hygiene, especially hand washing.
- ✓ Safe sourcing of drinking and cooking water and safe disposal of sewage.
- ✓ Use of approved cleaning chemicals.
- ✓ 'Clean as you go' concept and regular deep cleaning.

- ✓ Wash fruits and vegetables well under running water to remove visible dirt and any loose soil, even if the product is going to be peeled. Bacteria can move from the outside of the peel onto the inside as you cut and peel them. Vegetables such as spinach and butternut are always high risk due to the cooking times and the way the product is prepared. Ensure that a core temperature of 70°C is achieved.

Listeria monocytogenes



Source

Listeria monocytogenes is a type of bacteria that causes the infection listeriosis. Humans become infected from contact with products that contain or are contaminated with Listeria monocytogenes e.g. deli meats that aren't processed correctly or from dairy products made from milk that has not been pasteurized.

Unlike most other bacteria, Listeria can grow at cold temperatures and are not killed in the fridge or freezer.

Food commonly involved

Ready-to-eat deli meats and hot dogs, refrigerated pates and meat spreads, unpasteurised milk and dairy products, soft cheese made from unpasteurized milk such as brie, camembert and feta, refrigerated smoked seafood, raw sprouts and cantaloupe melons.

Symptoms

Onset may begin a few days after eating the contaminated food, but it may take as long as 30 days or more before the first signs and symptoms of infection begin. The flu-like symptoms include muscles aches, fever, nausea and diarrhoea.

Listeria monocytogenes may infect many different sites in the body, such as the brain, spinal cord membranes or the blood stream. The elderly, pregnant woman, unborn babies and people with weakened immune systems have a higher risk of getting a more severe form of listeriosis which, if not caught in time and treated, may result in death.

Control measures

- ✓ Cooking temperatures higher than 65°C kills the bacteria.
- ✓ Do not consume unpasteurized dairy, dairy products and fruit juice.
- ✓ Keep deli meats refrigerated between 1-5°C and use within 3-5 days after opening.
- ✓ Listeria likes living in drains and gullies, ensure that an effective cleaning schedule is in place and being actioned timelessly with correct use of chemicals.
- ✓ Use of approved cleaning chemicals.

Salmonella.spp



Source

Salmonella is found in human and animal intestines and excreted stools. The route into food areas is in raw foods of animal origins – meat, poultry, sausages, milk, eggs and egg products – or in animal excreta and fertilisers – for instance, on vegetables. Insects, birds and domestic pets can also be sources.

Salmonella bacteria are destroyed at temperature of 70°C and above, the bacteria do not form spores and is a gram-negative facultative rod-shaped bacterium.

Food commonly involved

Raw and undercooked meat and poultry, raw and uncooked eggs, raw milk, peanuts and peanut butter.

Symptoms

The incubation period varies between 12 – 72 hours after eating contaminated food. Typical symptoms include headache, abdominal pain, nausea, temporary or persistent diarrhoea, fever and vomiting. Symptoms usually last for four to seven days and most people recover without treatment however the illness can be fatal especially to vulnerable groups such as the young, old, ill and convalescing.

Animals and people can carry the bacteria long after they have been ill. Salmonella can live in someone's gut for more than 10 years after the person has suffered from Salmonellosis. Human carriers must not handle, prepare or help to serve food.

Control measures

- ✓ Separation of raw and high-risk foods and work areas.
- ✓ Thorough cleaning and disinfecting.
- ✓ Adequate temperature control.
- ✓ Effective personal hygiene.
- ✓ Effective pest control.
- ✓ Thaw food fully before cooking. If not thawed completely, the food stays frozen in the centre. During cooking, the centre does not reach high enough temperature to kill Salmonella.
- ✓ When cooking poultry, one must ensure that the centre of the poultry is cooked to a high enough temperature to kill bacteria.
- ✓ Use of approved cleaning chemicals.

Shigella.spp



Source

Shigella is a non-spore forming rod shaped bacteria genetically closely related to E. coli. Shigella bacteria produce toxins that can attack the lining of the large intestine, causing swelling, ulcers on intestinal walls and bloody diarrhoea.

Shigellosis, is caused by an infection of the Shigella bacteria and is highly contagious and can be spread from an infected person to another by contaminated water, food or direct contact.

Outbreaks for Shigellosis are associated with poor sanitation, contaminated food, water and crowded living conditions. Shigellosis is common amongst travellers in developing countries.

Food commonly involved

Foods that come into contact with human or animal waste can transmit Shigella. A wide variety of foods may be contaminated e.g. salads, macaroni, fruit, turkey, beans, strawberries, spinach, raw oysters, luncheon meat and milk.

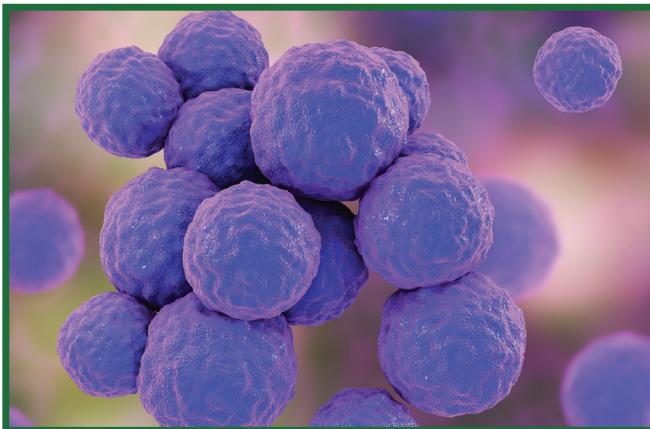
Symptoms

The estimated onset time is 1 - 7 days with an average of 3 days. Shigella has a wide range of symptoms including diarrhoea, cramping, vomiting and nausea. In very severe cases, a person may have convulsions, a stiff neck, a headache, extreme tiredness and confusion. It can also lead to dehydration and in rare cases, other complications like arthritis, skin rashes and kidney failure. Shigella bacteria infected cells line the inside of the intestine and often produce a toxin. The toxin affects both the intestines and nervous system. The illness is most commonly seen in child-care settings and pre-primary schools.

Control measures

- ✓ High standards of personal hygiene with food handlers.
- ✓ Proper handling, storage, and preparation of food.
- ✓ High standards of hygiene in the preparation area/s.
- ✓ Strict temperature control.
- ✓ Dispose of soiled diapers properly.
- ✓ Disinfect diaper changing areas after using them.
- ✓ Do not prepare food for others while ill with diarrhoea.

Staphylococcus aureus



Source

Staphylococcus aureus is a round-shaped (cocci) bacteria and are facultative anaerobically. It is found in grape-like clusters which tolerates salt and produces an exotoxin. The infections can range from mild to life threatening. Once in the human system, it can travel through the blood stream and infect the entire body.

Humans are the most common source of toxic-producing staphylococci. Most outbreaks have been tracked back to food handlers who carry and transmit the bacteria. Commonly found on humans – from the skin, nose, hands and hair. Also found in boils, carbuncles, sty, septic lesions, burns and scratches. Infected persons must not be allowed to handle food.

The bacteria are relatively high to heat resistance of 10°C for 30 minutes. The bacteria grow and produce toxins between 20°C - 40°C. Staphylococci are present in the air and on surfaces exposed to the air.

Food commonly involved

Raw milk from goats and cows – the bacteria and its toxin can also be found in cream and cheese. Cream filled pastries or desserts.

Symptoms

The estimated onset time of 3 - 6 hours after eating contaminated food. Symptoms include acute vomiting, abdominal pain, diarrhoea and sometimes collapse.

Control measures

- ✓ All food handlers must maintain high standards of personal hygiene.
- ✓ Adequate temperature control. Do not allow food to cool slowly from 40°C to 20°C, cool food quickly in a blast chiller and place into the fridge.
- ✓ Food must be handled as little as possible.
- ✓ Food handlers must report illness and must not be allowed to work while sick.
- ✓ Milk and milk products used in food preparation must be pasteurized.
- ✓ Effective food hygiene.
- ✓ Use of approved cleaning chemicals.

Vibrio cholerae



Source

Vibrio cholerae is a gram negative, comma shaped bacterium whose natural habitat is brackish or saltwater. Cholera is an infectious disease that causes severe watery diarrhoea, which can lead to dehydration and even death if untreated. It is caused by eating food or drinking water contaminated by faeces from a person infected with Vibrio cholerae.

Cholera has been nicknamed the “blue death” because a person dying of cholera may lose so much body fluid that their skin turns a blueish-grey. Boiling water is a very effective way to disinfect water, however it will not kill Vibrio Cholerae, the bacteria that causes cholera.

Cholera is highly contagious and can be transmitted from person to person by infected faecal matter entering a mouth or by water or food contaminated with the bacteria.

Food commonly involved

Contaminated water, seafood such as molluscan shellfish and crustaceans. Seafood can be contaminated in its natural environment or during preparation.

Symptoms

The symptoms generally appear 2 - 3 days after exposure and can range anywhere from 6 hours to 5 days. Cholera is caused by poisonous bacteria which multiply rapidly in the small intestine. The bacteria produce a toxin which causes a watery and/or bloody diarrhoea, abdominal pains, massive dehydration and eventually death if left untreated.

These bacteria can be found in faeces for up to 50 days and in soil or dust for up to 16 days. Bacteria survive well in water.

Control measures

- ✓ Drink and use safe water in clean preparation areas.
- ✓ Treat water with a chlorine product to disinfect.
- ✓ Excellent personal hygiene for food handlers - wash and sanitise hands.
- ✓ Use latrines or bury your faeces, do not defecate in any body of water.
- ✓ Cook food well (especially seafood), keep it covered, eat it hot and peel fruits and vegetables.
- ✓ Wash yourself, your children, diapers and clothes a minimum of 30 metres away from drinking water sources.