

FOOD AND WATERBORNE DISEASES

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See Health Educational Material [on diseases mentioned below](#).

There are various diseases that are transmissible to man via either, contaminated food or water, or possibly both.

The diseases mentioned below, although often uncommon, are prime examples of diseases one may acquire from contaminated food or water, and highlights the potential means of transmission, together with the preventative measures that should be followed at all times.

The Environmental Health section of the City of Cape Town strives to eliminate or minimise the potential risk of these diseases being acquired by the general public, by conducting extensive food control programs within the food retail sector.

It must however be stressed that food prepared for private consumption, and not for sale to the public, is outside the scope, and beyond the control of the Environmental Health section.

The following diseases may be transmitted via contaminated food and water: -

- **Botulism**

What is Botulism?

Botulism is the most severe of the food borne illnesses, but also the most uncommon. Botulism has a case fatality rate of between 15% and 20%. Usually occurs where food products are prepared or preserved by methods

which do not destroy the spores and which permit toxin formation. Botulism is usually associated with incorrect handling of postproduction canned foods and inadequate heat processing. Botulism is characterised by blurred or double vision, dry mouth, sore throat and vomiting and diarrhea, with eventual paralysis of the throat muscles and respiratory system. Unless adequately treated, about one third of patients may die within 3 to 7 days after onset of symptoms.

How does a person get Botulism?

The mode of transmission occurs from the ingestion of toxin, produced by the bacteria called *Clostridium botulinum*, preformed in contaminated food. Occurs predominantly after inadequate heating during the canning process.

Prevention

- Effective control of processing and preparation of commercially canned and preserved foods.
- Avoid rusted, blown, damaged or unlabelled canned foods.
- Always inspect canned foods carefully.
- If one is uncertain of quality of canned foods, boil the contents thoroughly.
- Avoid eating raw and fermented fish.

- **Brucellosis**

What is Brucellosis?

A systemic bacterial disease with sudden onset. Characterised by continued, intermittent or irregular fever, headache, weakness, profuse sweating, chills, depression, weight loss and generalised aching. The disease may last a few days, months or occasionally for a year.

How does a person get Brucellosis?

Brucellosis is an occupational disease and is usually associated with people who have contact with infected animals or their tissues, such as abattoir workers, vets and farm workers. However cases have occurred among consumers of unpasteurised milk (raw) or milk products (especially cheese) from cows, sheep and goats that are infected with brucellosis. The infectious bacteria are called *Brucella abortus*.

Prevention

- Avoid all milk and milk products from cows, sheep or goats that has not been pasteurised.
- Avoid consuming milk or milk products in the raw state.
- If pasteurisation is not possible, boiling the milk is essential.

- **Cholera**

What is Cholera?

Cholera is an acute diarrheal illness caused by infection of the intestine with the bacterium *Vibrio cholerae*. The infection is often mild or without symptoms, but may be severe. Symptoms include watery diarrhea, vomiting, and rapid dehydration. Without treatment a person may die within hours. Often confined to impoverished areas that have poor sanitation, and areas with inadequate treatment of sewerage and drinking water.

How does a person get Cholera?

A person may contract cholera by drinking water or eating food contaminated with the cholera bacterium, via faeces soiled hands or flies. Raw seafoods and shellfish may also be contaminated if from polluted waters. The infection is not likely to spread directly from one person to another.

Prevention

- Drink only water that is treated with chlorine or that you have boiled.
- Eat only foods that have been thoroughly cooked and are still hot, or fruit that you have peeled yourself.
- Avoid raw or uncooked seafood.
- Avoid seafood that has come from sewerage contaminated seawater.
- A simple rule of thumb "**Boil it, cook it, peel it or forget it**".
- Avoid using night soil as fertiliser.
- Active immunisation.

- **Food Poisoning - Bacillus Cereus**

What is Bacillus cereus food poisoning?

A gastrointestinal disorder characterised in some cases by sudden onset of nausea and vomiting and in others by colic and diarrhea. Symptoms tend to occur after 1 - 6 hours after infection. The infectious agent is the *Bacillus cereus* bacteria, an aerobic spore former. The poisoning generally persists for no longer than 24 hours and is rarely fatal.

How does a person get Bacillus cereus food poisoning?

By the ingestion of food that has been kept at room temperatures after cooking, allowing multiplication of the bacteria. Fried rice, vegetables and meat dishes mishandled after cooking are often responsible for the poisoning. Commonly found in raw, dried and processed foods.

Prevention

- Avoid cooked foodstuffs that have been standing at room temperature for some time.
- Serve food dishes as soon as they are cooked, or cool them rapidly until serving time.
- Promptly refrigerate left over foods.
- Avoid inadequately cooked foods.
- Thorough reheating should be performed rapidly to avoid multiplication of bacteria.

- **Food Poisoning - Clostridium Perfringens**

What is Clostridium perfringens food poisoning?

An intestinal disorder characterised by the sudden onset of colic, diarrhea and nausea, but seldom vomiting or fever. Generally a mild disease of short duration. Caused by the toxins elaborated by *Clostridium perfringens* or *Clostridium welchii* bacteria.

How does a person get Clostridium perfringens food poisoning?

Ingestion of food contaminated by soil or faeces that contain *Clostridium perfringens*. Almost all cases are associated with inadequately heated or reheated meats, usually stews, pies or gravies made of beef or chicken. The spores survive normal cooking temperatures, germinate and multiply during slow cooling, storage at ambient temperatures, or inadequate reheating. Often traced back to food catering firms, restaurants and school tuck shops, which

have inadequate cooking and refrigeration facilities for large-scale service, especially if foods are cooked several hours before serving.

Prevention

- Serve meat dishes as soon as they are cooked, or cool them rapidly until serving time.
- Reheating, if necessary, should be thorough (with an internal temperature of no less than 75 degrees C) and rapid, otherwise avoid reheating leftover foods.
- Large cuts of meat should be thoroughly cooked.
- Avoid cooked foodstuffs that have been standing at room temperature for some time.
- A simple rule of thumb "**Boil it, cook it, peel it or forget it**".

- **Food Poisoning - E-coli**

What is E.Coli food poisoning?

The organism can be found on a small number of cattle farms and can live in the intestines of healthy cattle. Meat can become contaminated during slaughter, and organisms can be thoroughly mixed into beef when it is ground. Bacteria present on the cow's udders or on equipment may get into raw milk. Although the bacteria, *Escherichia coli* is a normal inhabitant of the intestinal flora of man and animals, many strains are enteropathogenic and give rise to acute diarrhea in infants. E.Coli is considered to be responsible for a proportion of incidents described as "traveller's diarrhea". Eating meat, especially ground beef, that has not been cooked sufficiently to kill E. coli, can cause infection. Contaminated meat looks and smells normal. Although the number of organisms required to cause disease is not known, it is suspected to be very small.

How does a person get E-Coli food poisoning?

E. coli bacteria and its toxins have been found in the following:-

- Undercooked or raw beef hamburgers.
- Salami.
- Lettuce.
- Unpasteurised milk, apple juice, and apple cider.
- Contaminated well water.
- Unsuspecting swimmers have been infected by accidentally swallowing swimming pool water that has not been chlorinated and contaminated

by human faeces. People also can get infected by swimming in sewerage- contaminated water.

Bacteria in diarrhoeal stools of infected persons can be passed from one person to another if hygiene or hand washing habits are inadequate. This is particularly likely among toddlers who are not yet adequately toilet trained. Family members and playmates of these children are at high risk of becoming infected.

Prevention

- Cook beef meat patties thoroughly.
- Keep raw meat separate from cooked meat.
- Avoid unpasteurised juices.
- Drink only pasteurised milk and milk products.
- Wash fresh fruits and vegetables thoroughly with clean, fresh treated water before eating raw or cooking.
- Eat only thoroughly cooked meat and meat products.
- Wash hands thoroughly, especially after using the toilet.

• **Food Poisoning - Salmonellosis**

What is Salmonellosis?

Salmonellosis is a bacterial disease commonly manifested by sudden onset of headache, fever, abdominal pain, diarrhea, nausea, vomiting and dehydration. Dehydration in infants is often severe.

How does a person get Salmonellosis?

By ingestion of the *Salmonella* bacteria in food derived from infected food animals or contaminated by faeces of an infected animal or person. This includes raw (especially cracked) eggs and egg products, raw milk and milk products, meat and meat products and poultry and poultry products. Infection may also be spread by animal feeds and fertilisers prepared from contaminated meat scraps, fish meal and bones. The faecal oral route of transmission from person-to-person is an important mode of transmission when diarrhea is present (infants pose a greater risk). Usually a great number of *Salmonella* bacteria need to be ingested before illness develops. Epidemics of *Salmonella* infection can usually be traced back to foods such as commercially processed meat products, inadequately cooked poultry products, raw sausage, lightly cooked foods containing eggs or egg products,

unpasteurised milk, or foods contaminated by an infected person. The infection often starts with contaminated food and continues by person-to-person transmission via the hands of food handlers.

Prevention

- Avoid all cooked foods that have been prepared several hours before serving.
- Avoid cooked food that has been stored at room temperature for extended periods of time.
- Avoid inadequately cooked foods, especially poultry products.
- Strict personal hygiene.
- Washing of the hands, especially after using the toilet.
- Always cook poultry products thoroughly.
- Avoid reheating poultry product leftovers.
- Avoid unpasteurised milk and milk products.

- **Food Poisoning - Staphylococcal**

What is Staphylococcal food poisoning?

Staphylococcal food poisoning is an intoxication (not an infection) of abrupt and sometimes violent onset, with severe nausea, cramps, vomiting and diarrhea. The illness does not last longer than a day or two. Onset of symptoms is usually soon after eating contaminated food, between 30 minutes and 4 hours. Infection is caused by the enterotoxins of *Staphylococcus aureus*.

How does a person get Staphylococcus food poisoning?

By ingestion of a food product containing *Staphylococcus enterotoxin*. Foods involved are usually those, which are in contact with food handler's hands either without subsequent cooking or with inadequate heating or refrigeration, such as pastries, custards, salad dressings, sandwiches and cold meats. When these foodstuffs remain at room temperature for several hours before being eaten, toxin producing *Staphylococci* multiply and elaborate the toxin. The bacteria may be from an infected cut on the hand of a food handler or from their nose or eyes.

Prevention

- Strict food handling and hygiene.
 - Strict cleanliness of kitchens.
 - Strict personal hygiene of food handlers.
 - A simple rule of thumb "**Boil it, cook it, peel it or forget it**".
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- **Gastroenteritis - Diarrhea**

What is Gastroenteritis?

Gastroenteritis is an acute illness characterized by three or more watery or loose stools, cramps, nausea, urgency, bloating, fever, and malaise usually lasting 3 to 7 days, sometimes longer. Diarrhea is seldom life threatening. Outbreaks are common in areas with poor sanitation. Most of the time diarrhea is self-limiting and requires replacement of fluids and electrolytes (body salts) lost in loose stools. Sufferers should begin treatment by oral re-hydration by drinking large amounts of bottled or fruit juices, caffeine-free soft drinks, and Sports drinks. Avoid drinking iced or non-carbonated bottled fluids made from water of uncertain quality and dairy products. When in doubt of water purity use boiled or bottled water. Foods easily digested such as rice, bananas, gelatine, dry toast, and salty crackers can also be consumed to aid in re-hydration. Sufferers should always consult a doctor rather than attempt self-medication if the diarrhea is severe or does not improve within several days; if there is blood and/or mucus in the stool; if fever occurs with shaking chills; or if there is dehydration with persistent diarrhea.

How does a person get Gastroenteritis?

Gastroenteritis is usually contracted through ingestion of food or water contaminated by *Bacillus cereus* bacteria, or the faecal oral route.

Prevention

- Sanitary disposal of human faeces.
- Good personal hygiene.
- Maintenance of fly control.
- Regular hand washing.

- Only drink from safe water supplies that are regularly chlorinated, or alternatively, boiled.
- A simple rule of thumb **"Boil it, cook it, peel it or forget it"**.
- By not eating cooked foods that have been stored at room temperature for several hours.
- Prophylaxis.

- **Hepatitis A**

What is Hepatitis A?

Hepatitis A is a highly contagious viral disease that attacks the liver. Although hepatitis A is found throughout the world, its incidence is highest in developing countries, such as South Africa. Within 3 to 5 weeks after infection, an onset of symptoms that range from mild to severe fever, vomiting, abdominal pain, fatigue, jaundice, and lack of appetite, may occur. All people who have not had hepatitis A infection or vaccination for hepatitis A are at risk of developing the infection. Outbreaks commonly occur in institutions, day care centres, sub economic housing projects and rural areas, where environmental sanitation is poor or lacking. Infection is common and may occur at an early age.

How does a person get Hepatitis A?

Hepatitis A is most commonly spread from person to person and through food and water contaminated with the Hepatitis A virus, or by the faecal oral route.

Prevention

- Good personal hygiene.
- Good sanitation hygiene.
- Regular and careful hand washing, especially after going to the toilet.
- Prophylactics.
- Do not allow infected persons to prepare or handle food.
- Avoid inadequately cooked foods.
- Avoid eating shellfish from sewerage contaminated seawater.
- A simple rule of thumb **"Boil it, cook it, peel it or forget it"**.

- **Hepatitis E**

What is Hepatitis E?

Hepatitis E, is very similar to Hepatitis A, and is clinically indistinguishable from Hepatitis A. HEV is an viral transmitted disease that can be distinguished from other forms of acute viral hepatitis only by using specific serological testing. This disease is most often seen in young to middle age adults, and pregnant women appear to be exceptionally susceptible to severe symptoms and mortality. Symptoms include malaise, anorexia, abdominal pain and fever.

How does a person get Hepatitis E?

HEV is usually associated with faecal contaminated drinking water. The potential for HEV transmission from contaminated food is still under investigation, and there is no evidence of transmission by sexual exposures. There is no vaccine to prevent HEV.

Prevention

- Good sanitation practices.
- Good personal hygiene practices.
- The best prevention of infection is to avoid potentially contaminated water (and food), as with hepatitis A and other enteric infections.

- **Listeriosis**

What is Listeriosis?

Listeriosis is a serious infection caused by eating food contaminated with the bacterium *Listeria monocytogenes*. The disease affects primarily pregnant women, newborns, and adults with weakened immune systems. Listeria infection is not usually dangerous for healthy adults and children. Pregnant women are 20 times more likely than other healthy adults to get Listeriosis. In pregnancy, the listeria bacteria can cross the placenta and cause serious illness for the fetus or newborn and may lead to miscarriage, premature birth or stillbirth. In newborns, listeriosis can cause breathing problems, chest infections or meningitis, an inflammation of the lining of the brain. Listeriosis can be easily missed as it often presents with vague symptoms such as headache, nausea, vomiting, sudden fever, muscle and joint aches and pains or loss of balance. Severity of the symptoms varies. These symptoms usually appear within 2 to 30 days but can take up to 90 days after eating contaminated food. Symptoms vary from person to person, and the diagnosis is confirmed by a blood test. Listeria can be safely treated during pregnancy

with antibiotics. Such treatment prevents infection of the fetus or newborn. Infected newborns are also treated with antibiotics.

How does a person get Listeriosis?

Listeria monocytogenes is found naturally in soil, dust, ground water and animal feces (including those from pets), and may also be on unwashed raw produce, raw meats, processed foods, prepared meats (i.e. hot dogs, deli meats, etc.)

Prevention

- Use pasteurized milk and dairy products only.
- Cook raw foods from animal sources thoroughly (i.e. beef, pork, poultry).
- Be sure to wash all produce thoroughly under running water before eating.
- Wash hands, knives and cutting boards with hot soapy water after handling uncooked foods.
- Store raw meats separate from cooked and ready-to-eat foods.
- Make sure your refrigerator always stays at 5°C or below (*Listeria* can grow at refrigeration temperatures).
- Use all perishable foods that are precooked or ready-to-eat as soon as you can.
- Be sure to clean refrigerators on a regular basis.
- Try to eat freshly cooked or freshly prepared foods only.
- A simple rule of thumb "**Boil it, cook it, peel it or forget it**".

- **Shigellosis - Dysentery**

What is Shigellosis?

Shigellosis, also known as Bacillary dysentery, is an acute bacterial disease caused by the *Shigella* bacteria and involves the large and small intestine. Symptoms of the disease include diarrhea accompanied by fever, nausea and sometimes vomiting and cramps. In typical cases the faeces contain blood, mucous and pus (dysentery). The severity of the illness depends on the age and state of nutrition of the patient.

How does a person get Shigellosis?

By direct or indirect faecal-oral transmission from a patient or carrier. Infection may occur after an individual who fails to clean their hands thoroughly after using the toilet, transmits the infection by direct contact or

indirectly by contaminating food. Water, milk, cockroach and fly transmission may occur as a result of direct faecal contamination.

Prevention

- Sanitary disposal of human faeces.
- Regular hand washing, especially after using the toilet.
- Avoid inadequately cooked or reheated foods.
- Only drink from safe water supplies that are regularly chlorinated, or alternatively, boiled.
- Wash fruit and vegetables in clean chlorinated water or water that has been boiled.

- **Taeniasis - Beef Tapeworm**

What is Taeniasis? (Beef)

Taeniasis (beef) is an intestinal infection with the adult stage of the large beef tapeworm, called *Taenia saginata*. Infected persons pass the eggs to the soil through their faeces and cattle become infected after ingesting the eggs together with their food, resulting in an adult tapeworm developing in the intestine of the cattle and infecting their meat. Symptoms include nervousness, insomnia, anorexia, loss of weight, abdominal pain and digestive disturbances, but often the infection has no symptoms, except for worm segments emerging out of the anus. Taeniasis (beef) is usually a non-fatal infection. *Taenia saginata* is not directly transmitted from person to person.

How does a person get Taeniasis? (Beef)

Occurs frequently where beef is eaten raw or insufficiently cooked, and the cysts (larval stage) in the meat are ingested, with subsequent development of an adult tapeworm in the intestine.

Prevention

- Cook beef thoroughly before eating.
 - Prevent contamination of the soil, water and food with human faeces.
 - Avoid eating foods that have been irrigated by sewerage effluents.
 - Adequate inspection of beef carcasses.
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- **Taeniasis - Pork Tapeworm**

What is Taeniasis? (Pork)

Taeniasis (Pork) is an intestinal infection with the adult stage of the large pork tapeworm, called *Taenia solium*. Symptoms include nervousness, insomnia, anorexia, loss of weight, abdominal pain and digestive disturbances, but often the infection has no symptoms, except for worm segments emerging out of the anus. Taeniasis (Pork) is usually a non-fatal infection, but the larval infection called cysticercosis may be serious. Cysticercosis occurs when eggs of the pork tapeworm are swallowed and hatch in the intestines and the larvae then migrate to other organs and parts of the body to form cysts. The consequences may be serious if these cysts lodge themselves in the eye, central nervous system or the heart.

How does a person get Taeniasis? (Pork)

Occurs frequently where pork is eaten raw or insufficiently cooked, and the tapeworm or a part thereof is ingested, with subsequent development of an adult tapeworm in the intestine. Cysticercosis may occur by direct transfer of the *Taenia solium* eggs from the faeces of a person harbouring an adult worm to his own or another's mouth, or indirectly by ingestion of food or water contaminated with eggs.

Prevention

- Cook pork thoroughly before eating.
- Prevent contamination of the soil, water and food with human faeces.
- Avoid eating foods that have been irrigated by sewerage effluents.
- Adequate inspection of pork carcasses.

- **Toxoplasmosis**

What is Toxoplasmosis?

Toxoplasmosis is a systemic protozoal disease, caused by the protozoan *Toxoplasma gondii*. Toxoplasmosis occurs worldwide in mammals, birds and man. Infection in man is common, although not directly transmitted from person to person, except in utero. Primary infection is frequently asymptomatic, acute disease may occur with fever, lymphadenopathy and lymphocytosis persisting for days or weeks.

How does a person get Toxoplasmosis?

By eating raw or under cooked infected meat (pork or mutton, more rarely beef) containing cysts or by the ingestion of infective oocysts in food, water or dust contaminated with feline (cat) faeces. Cats acquire the infection as a faeces-borne infection from other cats, or from eating infected mammals, especially rodents or birds. Cats carry the parasite in their intestinal tract, with the oocysts being excreted in their faeces 10 - 20 days later, where the cysts can remain infective in water or moist soil for months or years. Transplacental infection in humans may occur if the pregnant woman has a primary infection. Children are often at risk from ingesting infective oocysts in play sand boxes in which cats has defaecated. Cysts in the flesh of an infected animal remain infective as long as the meat is edible and uncooked.

Prevention

- Cook meat thoroughly.
- Feed cats dry, canned or boiled food and discourage them from hunting or scavenging.
- Dispose of cat faeces and litter daily. Faeces can be flushed down the toilet, and dried litter should be disposed of without shaking, to avoid dispersal of oocysts in the air.
- Pregnant woman should avoid cleaning litter trays or contact with cats of unknown feeding history, unless the woman is known to have antibodies to *Toxoplasma gondii*.
- Wear gloves while gardening and thoroughly wash hands afterwards.
- Children's play sand boxes should be covered when not in use.
- Wash hands thoroughly after handling raw meat or contact with soil possibly contaminated with cat faeces.

- **Trichinellosis**

What is Trichinellosis?

A disease caused by an intestinal roundworm (nematode) *Trichinella spiralis*, whose larvae migrate to and become encapsulated in the muscles. Sudden appearance of muscle soreness and pain, and edema of upper eyelids is a common early and characteristic sign of infection. Other symptoms include thirst, profuse sweating, chills, weakness, prostration and high fever. Gastrointestinal symptoms, such as diarrhea, due to the intractintestinal activity of the adult worms, may occur.

How does a person get Trichinellosis?

By eating raw or insufficiently cooked meat of animals containing viable encysted larvae, especially pork and pork products, and "beef products" such as hamburger patties mixed either intentionally or inadvertently with raw pork. Once in the small intestine, the larvae develop into adult worms, with the female worms producing further larvae, which penetrate the lymphatic system and are then spread through the body via the bloodstream, eventually becoming encapsulated in the skeletal muscle of the body.

Prevention

- Cook all fresh pork and pork products at sufficiently high temperatures for long time duration.
- Avoid feeding pigs with garbage or offal.
- Pork should always be handled separately from other meats and foodstuffs, to avoid cross contamination.

- **Typhoid Fever**

Typhoid Fever is a severe systemic bacterial infection and is characterised by the onset of fever, headache, malaise, anorexia, rose spots on the trunk, non-productive cough, constipation more commonly than diarrhea. The infectious bacteria are *Salmonella typhi*.

How does a person get Typhoid fever?

By food or water contaminated by faeces or urine of an infected person or carrier during the food preparation process. Shellfish taken from sewerage contaminated beds and raw fruits, vegetables, milk and milk products contaminated by the hands of infected persons or carriers.

Prevention

- Sanitary disposal of human faeces.
- Regular hand washing.
- Only drink from safe water supplies that are regularly chlorinated, or alternatively, boiled.
- Wash fruit and vegetables in clean chlorinated water or water that has been boiled.
- If uncertain of sanitary practices when buying food, then select food that is cooked and hot.
- Fly control.
- Typhoid vaccine is currently available.
- It is important to follow food and water precautions.



For You and Planet Blue.



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- Immunization is recommended for all persons living in areas where sanitation is inadequate or under developed.
- A simple rule of thumb "**Boil it, cook it, peel it or forget it**".