Frequently Asked Questions

Q.NO.1 What are food borne diseases and what are their main causative agents?

ANS. Foodborne diseases are wide spectrum of illnesses that result from ingestion of foodstuffs contaminated with microorganisms or chemicals. The contamination of food may occur at any stage in the process from food production to consumption and can result from environmental contamination, including pollution of water, soil or air. The main causative agents are:

1. Bacterial
2. Viral
3. Parasitic
4. Toxic products of these organisms.

Q.NO.2 How is salmonellosis treated?
Ans Salmonella-induced gastroenteritis treatment

Usually, symptoms will last for about 1 week and will resolve without any treatment. It is important to monitor the hydration levels of the patient by making sure they have an adequate fluid intake. If the doctor suspects the bacteria have entered the bloodstream, or are likely to, they may prescribe antibiotics. Antimotility drugs (to stop diarrhea) generally are discouraged, especially in people with bloody diarrhea or diarrhea complicated by a fever.

Typhoid fever treatment

The Salmonella bacteria that causes typhoid can be killed by antibiotics such as ciprofloxacin or ceftriaxone. However, some strains become resistant to antibiotics after long-term use, and antibiotics have known side effects.
Additional treatments for typhoid include drinking fluid to prevent dehydration and eating a healthy diet to ensure the absorption of nutrients.

Q.NO.3 Write short note on Shigellosis?
Ans. Shigellosis is an infectious diarrheal disease caused by a group of bacteria called Shigella. Most who are infected with Shigella develop diarrhea, fever, and stomach cramps starting a day or two after they are exposed to the bacteria. Shigellosis usually resolves in 5 to 7 days. Some people who are infected may have no symptoms at all, but may still pass the Shigella bacteria to others. The spread of Shigella can be stopped by frequent and careful handwashing with soap and taking other hygiene measures. There are four species of Shigella:

- Shigella sonnei (the most common species in the U.S.)
- Shigella flexneri
- Shigella boydii
- Shigella dysenteriae

S. dysenteriae and S. boydii are rare in the United States, though they continue to be important causes of disease in the developing world. Shigella dysenteriae type 1 can cause deadly epidemics.

Q.NO.4 What is Hemolytic uremic syndrome (HUS)?
Ans. Hemolytic uremic syndrome (HUS) usually occurs in children after 5 to 10 days of diarrhea. This infection is caused by certain strains of Escherichia coli (E. coli) bacteria. It can also develop in adults due to E. coli or other types of infection, certain medications, or pregnancy. This illness is associated with the abnormal destruction of red blood cells that in turn clog the filtering system in the kidneys, which can lead to life-threatening kidney failure. HUS is a serious condition. But timely and appropriate treatment leads to a full recovery for most people, especially young children.

Q.NO.5 Write short note on the life cycle of Cryptosporidium?
Ans. The life cycle of Cryptosporidium spp. exist as multiple cell types corresponding to different stages in an infection. (e.g., a sexual and asexual stage). It completes its life cycle in a single host. Infection is initiated by ingestion of oocysts which are hard and thick walled spores and can survive in the environment for months and is resistant to many common disinfectants, particularly

chlorine-based disinfectants. The oocysts activated in the stomach and upper intestines to release 4 infective sporozoites. These motile sporozoites attach to the microvilli of the epithelial cells of the small intestine and become trophozoites that reproduce asexually by multiple fission, a process known as schizogony. The trophozoites develop into Type I meronts that contain 8 daughter cells.

These daughter cells are Type I merozoites, which get released by the meronts. Some of these merozoites can cause autoinfection by attaching to epithelial cells. Others of these merozoites become Type II meronts, which contain 4 Type II merozoites. These merozoites get released and they attach to the epithelial cells. From there they become either macrogamonts or microgamonts. These are the female and male sexual forms, respectively. This stage, when sexual forms arise, is called gametogony.

Zygotes are formed by microgametes from the microgamont penetrating the macrogamonts. The zygotes develop into oocysts of two types. 20% of oocysts have thin walls and so can reinfect the host by rupturing and releasing sporozoites that start the process over again. The thick-walled oocysts are excreted into the environment. The oocysts are mature and infective upon being excreted.

Q.NO.6 What are the causes and symptoms of Trichinosis?

Ans. Causes

The main causes are consuming raw or undercooked meats such as pork, wild boar, bear, bobcat, cougar, fox, wolf, dog, horse, seal or walrus infected with trichinella larvae. The illness does not spread directly from person to person.

Symptoms

The symptoms that appear first are nausea, diarrhea, vomiting, fever, fatigue and abdominal pain followed by headaches, eye swelling, aching joints and muscles, weakness and itchy skin. Severe infections are associated with heart and breathing problems. Death may occur in severe cases.

Q.NO.7 How does Cysticercosis occur?

Ans Cysticercosis occurs by the following ways:

- By consuming food or water contaminated with the eggs of T. solium (pork tapeworm). Worm eggs hatch and the larvae then

migrate to various parts of the body and form cysts called cysticerci. This can be a serious or fatal disease if it involves organs such as the central nervous system, heart, or eyes.

- By putting anything into your mouth that has touched the stool of a person infected with T. solium.
- Some persons with intestinal tapeworms may infect themselves with eggs from their own feces as a result of poor personal hygiene.

Q.NO.8 Write short note on viruses as food borne causative agents?
Ans. Viruses are small infectious agents that contain genetic material and replicate inside living cells of other organisms. Viruses cannot grow on or in foods like bacteria. Foodborne illnesses are associated with viruses due to contamination of the fresh produce or processed food by virus-containing fecal matter. The most commonly reported viruses responsible for causing foodborne illnesses are Noroviruses, hepatitis A and E viruses, rotaviruses and astrovirus. Recent studies show that almost 67% of foodborne illnesses are caused by viruses alone. These microorganisms are highly infectious and can survive under drastic conditions such as high acidic pH and low temperatures hence immunization is performed in order to prevent illness and disease outbreaks caused by viruses. With an increased recognition of the clinical significance and impact of acute viral illness associated with food and water in humans of all ages, there has been a recent surge in developing prophylactic vaccines against such viruses. So far, there are no vaccines available to prevent illness associated with foodborne viruses except for hepatitis A virus. The widespread immunization of some risk group has helped in significantly reducing the outbreaks of hepatitis A. Novel strategies are currently in development for the production of vaccines against noroviruses and rotaviruses. In the near future, such vaccines will significantly reduce the burden associated with foodborne illnesses associated with these viruses.

Q.NO.9 How are viruses detected in food?
Ans. Detection of viruses in food has not been considered possible in a routine laboratory because of their requirement for a living host or animal tissue for growth. In addition, the level of virus particles in a contaminated food is usually very low. Specialist laboratories

may achieve detection using cell culture and complex extraction methods but techniques previously available are not suitable for routine application and recovery rates remain poor. The use of the polymerase chain reaction (PCR) is being developed for detection of norovirus in foodstuffs implicated as the source of outbreaks. A recent method, said to give results in under 4 hours, involves recirculating-IMS linked to PCR (paper on inter-laboratory trials awaiting publication).

Methods currently used for routine detection of NLVs in faeces are based on immunoassays and PCR. Ideally, samples should be collected within 48 hours of the onset of symptoms since these contain the greatest levels of the virus. Use of this PCR test enables the detection of more than 90% of NLV infections and also allows characterization of the strains.

Detection of Hepatitis A virus in faeces is not usually possible because, by the time jaundice occurs, the peak of excretion of virus particles has passed. Diagnosis is based on detection of specific IgM and IgG antibodies in the blood serum or saliva

Q.NO.10 Write note on Norovirus in food borne illness?

Ans. Illness caused by norovirus is usually sudden in onset and characterised by vomiting, diarrhoea and abdominal pain. Vomiting frequently occurs without warning and may be projectile and uncontrollable, whilst diarrhoea may be explosive. The incubation period is usually 24 - 36 hours after eating an implicated food but may be from 15 - 72 hours, depending on the number of virus particles consumed. The duration of the symptoms varies from 12 - 72 hours but, after the initial uncontrollable onset, the symptoms may be relatively mild. Despite this, sufferers may feel debilitated for 2-3 weeks. Very few virus particles are needed to cause illness, so the attack rate in an outbreak can be very high, with the majority of people who ate the contaminated food becoming ill. Because the viruses multiply in the gut, a very large number of virus particles are excreted during the illness (often more than 10 million per gram of faeces or vomitus). As a result of the uncontrollable nature of the symptoms, food can easily become contaminated by infected food handlers and secondary person-to-person spread is also common.