



Foodborne Viruses

Food contaminated with bacteria, parasites, toxins, and/or viruses can cause foodborne illness. Foodborne viral infections are common, and are often under-diagnosed. Some alternative names for foodborne viral infections are: stomach flu, 24-hour flu, gastroenteritis, and human enteric pathogenic virus infections.

For most enteric viruses (enteric means affecting the stomach or the intestinal tract), the symptoms appear suddenly and strongly, and last for 24 to 48 hours, but they can leave the afflicted person feeling weak for days. The symptoms of foodborne viruses include; vomiting, diarrhea, stomach or abdominal cramps, with the possibility of fever and malaise. Some specific viral infections can have more severe complications and are discussed below.

Most infections are self limiting and do not require medical treatment. A common complication is dehydration caused by a loss of bodily fluids, with resulting electrolyte imbalances. This can quickly become a severe complication, especially in children, elderly, or other **PEOPLE AT RISK**

Foodborne viral infection outbreaks are often reported by the media. Viruses involved in foodborne illness are highly contagious, and are usually affecting large numbers of people, such as on cruise ships, in nursing homes, day care facilities, and at banquets.

Viruses can not grow in food; they require a host; i.e. human, animal, plant, etc. Food is commonly contaminated with viruses through an infected person preparing the food. Food items and hands can also be contaminated by washing with contaminated water, or through **cross-contamination**. Shellfish and other seafood can harbour viruses in their muscles if they were exposed to (fresh or sea) water contaminated with sewage.

Because human hands are the most common source for spreading the viruses, adequate hand washing is **KEY** to minimizing their spread (**Handwashing Fact Sheet**). Rotavirus for example has been shown to remain active for more than 20 minutes from the time it leaves the body; astravirus can survive 60 days on paper under favourable conditions. This creates huge potential for cross-contamination and spread of infection.

With some foodborne viral infections a person may shed viruses for days before symptoms appear, and some people never show symptoms. The response to an infection with a foodborne or enteric virus is dependent on: the individual, the number of viruses consumed and the type of virus. Some viruses stimulate immunity, so once a person has had an infection with the virus and recovered, this person becomes immune and will not develop symptoms again.



Cross-contamination occurs for example, when an infected person transmit the virus by touching surfaces and handling utensils (counter top, utensil, refrigerator handle, toilet lever) thus exposing food and unaffected persons to the virus.

Following are the common and emerging viruses transmitted by food and food environments.

Adenovirus causes vomiting and diarrhea sometimes accompanied by respiratory tract syndromes (coughing) in young children. It takes 1 to 3 days for signs of an infection to appear.

Astrovirus causes gastrointestinal symptoms. It is responsible for 9% of children hospitalized with diarrhea in the United States. In children under 4 years, symptoms usually appear within 1 to 3 days of infection. Most children develop immunity to the virus. Symptoms are the same as for **Rotavirus**; vomiting for up to 48 hours which is generally followed by 24 hours of diarrhea. This can be fatal if dehydration and electrolyte imbalances occur.

Rotavirus is highly contagious, requiring only 10 – 100 virus particles to cause an infection. It affects mainly children age 6 to 24 months, and is responsible for 50% of the children hospitalized due to diarrhea in the United States. It is more prevalent in the winter months and can also infect adults, especially, **PEOPLE AT RISK**.

Avian Influenza is not a current concern in North America because there have not been any reported human cases. Caution should be used when travelling to countries where the disease is prevalent. Do not consume undercooked or raw chicken or other fowl. Follow the guidelines for safe cooking of fowl; cook until the internal temperature reaches a minimum of 74°C or 165°F; higher temperatures may be used to achieve the desired texture/quality (**Cooking Temperatures Fact Sheet**).

The people who are at highest risk for the disease in North America are hunters and those working in slaughter facilities or anyone who is in close contact with secretions, excretions, and viscera of birds, because the disease is believed to be passed mainly through ingestion of these. Poultry farmers should also take special precautions.

Hepatitis A is a common water contaminant particularly in developing countries. It can be present in food when contaminated water is used to rinse the food, or if the item is prepared by an infected handler. Shellfish can also harbour the virus. Shellfish can remain contaminated for up to 6 weeks after they have been exposed to contaminated water. The virus is resistant to environmental stresses including pressure treatments commonly used to “treat” oysters at harvest.



A person infected with the virus can shed the virus in the feces for 2 to 4 weeks before symptoms appear and up to 3 months after the symptoms have receded. Symptoms include: jaundice, decreased appetite, dark coloured urine, fatigue, and abdominal cramps. A vaccine is available, and immunity is also achieved once a person has been infected by the virus. For more information see **Hepatitis A Fact Sheet**.

Hepatitis E is a major concern in developing countries. In North America, it is considered an emerging issue; even though no known cases have originated from this area. Hepatitis E has been isolated in swine and rats, and in pig livers sold in the grocery stores in the United States. (Feagins, et. al, 2007) Major outbreaks in Japan implicated undercooked pork and deer meat as sources of infection. (Feagins, et. al, 2007) The virus mainly affects adults and causes hepatitis, with symptoms identical to Hepatitis A. The virus can be detected in the feces of persons one week before symptoms appear. The illness can last for up to 6 months. Vaccines are not available. The main concern is for pregnant women, as infected individuals have a 25% death rate. The virus causes no long term liver dysfunction.

Caliciviruses affect mainly children from age 6 to 24 months. Most children develop immunity to the virus. The main symptom is diarrhea. A special calicivirus called norovirus causes the majority of foodborne viral infections.

Norovirus was previously called Norwalk-like virus. Noroviruses account for most foodborne viral infections. They are highly contagious with symptoms occurring 24 to 48 hours after infection and continuing for 24 to 48 hours. Noroviruses affect all age groups, and no immunity is developed after infection. Outbreaks commonly occur where large numbers of people gather, such as cruise ships, nursing homes, nursery schools, etc.

The virus is passed to food mainly from infected food handlers or by **cross-contamination**, but can be passed in swimming water and drinking water contaminated with human feces. Symptoms last usually only 24 to 48 hours and the most common complication is the loss of bodily fluids (dehydration) resulting in imbalances in the body's electrolytes. Symptoms include: nausea, vomiting, diarrhea, fever, and general malaise. For more information see **Norovirus Fact Sheet**.

Parvovirus can also be spread by food; shellfish can harbour the virus. It causes mild, flu-like symptoms with the possible complications of anemia and joint pain. It is a particular concern for pregnant women and other **PEOPLE AT RISK**. Symptoms appear 4 to 14 days after infection.



PEOPLE AT RISK

People at risk are those individuals who have a weakened body defense system (immune system) and are referred to as immunocompromised. For various reasons,

the immune system of the individual is lower than that of the average person. People at risk are more vulnerable to infections from pathogens or at risk for greater health complications from an infection.

Examples of people in this group include; pregnant women, people over 65 years old, children, people receiving cancer treatment, people with HIV/AIDS infections, and people with chronic health conditions such as diabetes.

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For more information on Foodborne Viruses or other Food Safety topics, please call the Food Safety Network toll-free at 1-866-50-FSNET (37638) or visit www.foodsafetynetwork.ca

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