

## Hepatitis E: A foodborne zoonotic threat in the US and abroad

Hepatitis is inflammation of the liver, a condition caused by several viruses including Hepatitis A, B, C, and E. Hepatitis E virus (HEV) is a pathogen found in several agriculturally important animal species and in humans. Humans can acquire some strains of HEV from animals. HEV is endemic in many U.S. swine herds without producing detectable disease and has been detected in pork products sold in grocery stores [1]. Avian HEV does not infect humans but causes big liver and spleen disease and hepatitis-splenomegaly syndrome in poultry, negatively affecting commercial broiler/breeder and laying flocks. People can become infected by consumption of undercooked pork or other meat products, via tainted drinking water, or through produce irrigated with feces from infected swine herds.

### **Symptoms of illness**

Symptoms of hepatitis E are similar to those of other types of acute viral hepatitis and liver injury. They include fever, fatigue, loss of appetite, nausea, vomiting, abdominal pain, jaundice, dark urine, clay-colored stool, and joint pain. Many cases of hepatitis E are asymptomatic and most resolve on their own [2].

### **Public health consequences**

The exact number of Hepatitis E cases that occur each year is difficult to determine. Many cases do not have symptoms, the symptoms often occur weeks after exposure and spontaneously self-resolve making accurate diagnoses difficult. Symptomatic hepatitis E commonly occurs among teens and young adults (people aged 15–44 years). Pregnant women are more likely to experience severe illness, including fulminant hepatitis and death [3]. Immunocompromised individuals can progress to chronic infection that affects many parts of the body including kidneys, nerves, and brain[4].

### **Risk factors**

Anyone can get Hepatitis E, but persons who have lowered immune function due to underlying factors like organ transplantation, cancer, or AIDS are more likely to develop chronic and severe infections. People with underlying liver issues are also at higher risk of severe disease. Finally, pregnant women in their third trimester are more susceptible to severe disease for unknown reasons. A higher exposure rate has been noted in swine workers and veterinarians [5].

### **Foods implicated**

In developing countries drinking unsanitary water is the primary cause of HEV infection. In developed countries eating improperly cooked animal meats including pork (liver, sausage), boar, deer, camel, rabbit, and others can lead to infections. In the United States 6.5% of pigs at slaughter have been shown to have the virus [6, 7]. Live virus survives meat processing procedures and can be found in pork products for sale in the supermarket [1, 5]. HEV has been detected in shellfish such as oysters and on strawberries that were fertilized with infected pig manure [8]. Avoid uncooked and unwashed foods.

### **How to prevent infection**

1. Use a thermometer to make sure that raw foods are cooked to safe temperatures; at least 71°C (159.8°F) for 5 minutes to destroy HEV [9].

The only way to be sure food is to 159.8°F is to check with a food thermometer.

2. Wash fruits and vegetable before eating them.
3. Wash hands with warm soapy water before and after handling raw foods and if coming into contact with live animals such as pigs or rabbits.
4. If traveling in countries with poor sanitation only consume bottled water without ice.

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