



## DATASHEET

Microbiological Hazard Series

**Pathogen Name:** Hepatitis A virus (HAV)

**Characteristics:** HAV is a member of the Picornaviridae family and *Hepatovirus* genus. It is an icosahedral, non-enveloped, positive-sense RNA virus and is 27-32 nm in diameter. Although HAV cannot grow in the environment, it can survive refrigeration and freezing for up to two years and is resistant to acid (pH 1 for 2 hours at room temperature). HAV has a higher resistance to many chemicals and drying than other enteroviruses.

**Pathogenicity:** HAV causes acute hepatitis and is not associated with chronic liver disease. Most individuals infected with HAV develop nonspecific constitutional signs and symptoms followed by gastrointestinal symptoms. The virus is primarily spread when an uninfected (and unvaccinated) person ingests food or water that is contaminated with the faeces of an infected person.

**Infectious Dose:** The infective dose for HAV is unknown. However, it is thought that as few as 10-100 virus particles could cause disease.

**Sources (Including High - Risk food groups):** HAV is most commonly spread by direct person to person contact via the faecal-oral route. Food-borne outbreaks can often be traced back to an infected food handler or foods that have come into contact with faecally contaminated water.

Food sources include water, shellfish (such as oysters, cockles and mussels) and milk. Fresh produce such as salads, fruit and vegetables are also sources. These are likely to be consumed raw or lightly cooked and can become contaminated with faecal matter at almost any point during growing, harvesting, transport and packing.

**Onset Period:** Can range between 15-50 days.

**Illness, Symptoms and Complications:** Symptoms usually include fever, nausea, vomiting, diarrhoea, fatigue, poor appetite, abdominal discomfort and often jaundice. The jaundice starts to occur generally 5-7 days after the onset of the gastrointestinal symptoms.

HAV infections can be asymptomatic or symptomatic. When disease does occur, it is usually mild and recovery is complete within 1 to 2 weeks, although it may last up to several months, in which case it is also generally self-limiting.

The severity of disease and fatal outcomes are higher in older age groups. Infected children under 6 years of age do not usually experience noticeable symptoms, and only 10% develop jaundice. Among older children and adults, infection usually causes more severe symptoms, with jaundice occurring in more than 70% of cases.

An atypical, and rare, clinical outcome of acute HAV infection is fulminant hepatitis or fulminant hepatic disease, which occurs in less than 1% to 1.5% of cases. This more severe outcome of acute HAV infection and illness involves massive hepatic necrosis, with acute liver failure, and has a high case-fatality rate (70% to 80%)

### Controls to reduce the risk:

Strategies to reduce the risk of food-borne outbreaks of Hepatitis A should focus on preventing foods from becoming contaminated.

It is always important to make sure only approved suppliers are used when purchasing raw materials. It is also important that clean, treated water should be used for the irrigation, washing and processing of foods.

Food handlers should implement frequent hand washing and the wearing of gloves particularly at points of the food chain where foodstuffs that will receive no further cooking are handled. Any food handlers suffering from Hepatitis A should be removed from food production areas until medical release.

HAV is relatively heat resistant, however thorough cooking at a temperature of 85°C for 1 minute can inactivate the virus.

For shell fish, harvesting should be monitored for sewage contamination.

EXAMPLE OUTBREAKS		
YEAR	LOCATION	DETAILS
2003	USA	Imported green onions contaminated before or during packing on the farm resulted in 601 cases with 3 deaths.
2016	Hawaii	Raw scallops linked to the virus resulted in 206 people becoming ill with 51 requiring hospitalisation.
2017	Denmark	Dates originating from Iran linked to the virus which resulted in 27 people becoming ill.

SUMMARY TABLE	
<b>Source</b>	<ul style="list-style-type: none"> <li>Person to person (via faecal oral route)</li> <li>Water</li> <li>Shellfish</li> <li>Fruits and vegetables</li> </ul>
<b>Growth Temperature</b>	<ul style="list-style-type: none"> <li>Not specified – However it is heat resistant at 70°C for up to 10 minutes.</li> </ul>
<b>Growth pH range</b>	<ul style="list-style-type: none"> <li>Resistant to acidic conditions (pH as low as 1 for 2 hours)</li> </ul>
<b>Onset period</b>	<ul style="list-style-type: none"> <li>Range between 15-50 days</li> </ul>
<b>At risk groups</b>	<ul style="list-style-type: none"> <li>Anyone who have not been vaccinated or been previously infected</li> <li>Anyone who resides in areas where the virus is widespread (high endemicity)</li> <li>More severe in older groups</li> </ul>
<b>Illness, Symptoms, Complications</b>	<ul style="list-style-type: none"> <li>Fever</li> <li>Vomiting</li> <li>Abdominal Pain</li> <li>Poor appetite</li> <li>Jaundice</li> </ul>
<b>Controls</b>	<ul style="list-style-type: none"> <li>Ensure safe water supplies</li> <li>Heat treatment of food and liquids to 85°C for 1 minute.</li> <li>Personal hygiene e.g. regular hand washing for food handlers</li> <li>Food handlers suffering from Hepatitis A should be removed from food production areas.</li> <li>Gloves</li> <li>Personal Protective Clothing</li> </ul>
<b>Published Risk Assessments</b>	<ul style="list-style-type: none"> <li>American Society for Microbiology: Risk Assessment in Shellfish-Borne Outbreaks of Hepatitis <a href="http://aem.asm.org/content/75/23/7350.full">http://aem.asm.org/content/75/23/7350.full</a></li> <li>Science Direct: Quantitative farm-to-fork risk assessment model for norovirus and hepatitis A virus in European leafy green vegetable and berry fruit supply chains <a href="https://www.sciencedirect.com/science/article/pii/S0168160514006187">https://www.sciencedirect.com/science/article/pii/S0168160514006187</a></li> <li>EFSA: Outbreak of hepatitis A virus infection in Italy and Ireland <a href="https://ecdc.europa.eu/sites/portal/files/media/en/publications/Publications/ROA-update_HAV_Italy_Ireland-final.pdf">https://ecdc.europa.eu/sites/portal/files/media/en/publications/Publications/ROA-update_HAV_Italy_Ireland-final.pdf</a></li> </ul>

## References

- Lawley, R., 2018. *The Food Safety Hazard Guidebook*. Royal Society of Chemistry
- Bad Bug Book (Second Edition). 2018. *Bad Bug Book (Second Edition)*. [ONLINE] Available at: <https://www.fda.gov/downloads/Food/FoodbornenessContaminants/UCM297627.pdf> [Accessed 20 March 2018]
- Public Health Agency of Canada. 2018. *Pathogen Safety Data Sheets: Infectious Substances – Hepatitis A virus (HAV) - Canada.ca*. [ONLINE] Available at: <https://www.canada.ca/en/public-health/services/laboratory-biosafety-biosecurity/pathogen-safety-data-sheets-risk-assessment/hepatitis-a-virus.html>. [Accessed 20 March 2018].
- Foodqualitynews.com. 2018. *Dates from Iran linked to Hepatitis A outbreak in Denmark*. [ONLINE] Available at: [https://www.foodqualitynews.com/Article/2018/03/19/Dates-from-Iran-linked-to-Hepatitis-A-outbreak-in-Denmark?utm\\_source=newsletter\\_daily&utm\\_medium=email&utm\\_campaign=19-Mar-2018&c=9ZV9gavqyCnVCV2VuT%2FOftxsl9eF6uPh&p2=](https://www.foodqualitynews.com/Article/2018/03/19/Dates-from-Iran-linked-to-Hepatitis-A-outbreak-in-Denmark?utm_source=newsletter_daily&utm_medium=email&utm_campaign=19-Mar-2018&c=9ZV9gavqyCnVCV2VuT%2FOftxsl9eF6uPh&p2=). [Accessed 20 March 2018].
- Foodqualitynews.com. 2018. *Imported scallops sicken 200 in Hawaii*. [ONLINE] Available at: <https://www.foodqualitynews.com/Article/2016/08/22/Imported-scallops-sicken-200-in-Hawaii>. [Accessed 20 March 2018].
- World Health Organization. 2018. *WHO | Hepatitis A*. [ONLINE] Available at: <http://www.who.int/mediacentre/factsheets/fs328/en/>. [Accessed 20 March 2018]
- A., R., 2008. *Supervising Food Safety: Level 3: A Text for Level 3 Food Safety Courses and a Reference for supervisors*
- <https://www.foodsafety.gov/poisoning/causes/bacteriaviruses/hepatitisa/index.html> [Accessed on 20<sup>th</sup> March]
- Foodstandards.gov.au <https://www.foodstandards.gov.au/publications/Documents/Hepatitis%20A%20virus.pdf> [Accessed on 20<sup>th</sup> March]