

# iMIS Food -Biological Hazards - Viruses Table

| Name                                              | Morphology                                   | Origin                                                                                      | Food Products                                                          | Health Effects                                                                                                                | Regulation (EU)                                                                                                                                            | Prevention                                                                                                                                                                           | Inactivation Parameters                                                                                                                                          | Comments                                                                    |
|---------------------------------------------------|----------------------------------------------|---------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| <b>Hepatitis A Virus</b><br>(HAV)                 | Picornaviridae<br>ssRNA (+)<br>Non-enveloped | Human intestinal tract.<br>Route: Faecal-oral (infected handlers, contaminated water/food). | RTE foods, bivalve molluscs (oysters, clams), fresh produce (berries). | <b>Infectious hepatitis:</b> Fever, malaise, nausea, jaundice.<br>Onset: ~28 days.                                            | <ul style="list-style-type: none"> <li>· Reg. (EC) No 852/2004: GHP.</li> <li>· Reg. (EC) No 853/2004 &amp; (EU) 2019/627: Rules for shellfish.</li> </ul> | <ul style="list-style-type: none"> <li>· Strict personal hygiene.</li> <li>· Exclusion of ill staff.</li> <li>· Safe sourcing (water, shellfish).</li> <li>· Vaccination.</li> </ul> | <b>Inactivation:</b> High-concentration chlorine, high heat ( $\geq 90^{\circ}\text{C}$ ).<br><b>Resistance:</b> Alcohol, low pH, drying, freezing. Very stable. | Does not cause chronic disease. Outbreaks often linked to imported produce. |
| <b>Hepatitis E Virus</b><br>(HEV; Genotype 3 & 4) | Hepeviridae<br>ssRNA (+)<br>Non-enveloped    | Zoonotic reservoir (pigs, wild boar).<br>Route: Consumption of undercooked meat/offal.      | Raw or undercooked pork (liver, sausages), wild boar, deer meat.       | <b>Infectious hepatitis:</b> Fever, fatigue, jaundice. Often asymptomatic. Severe for pregnant women.<br>Onset: ~40 days.     | <ul style="list-style-type: none"> <li>· Reg. (EC) No 852/2004: GHP.</li> <li>· Reg. (EC) No 853/2004: Hygienic handling of meat.</li> </ul>               | <ul style="list-style-type: none"> <li>· Thorough cooking of pork and game meat.</li> <li>· Avoid cross-contamination.</li> </ul>                                                    | <b>Inactivation:</b> High heat ( $\geq 71^{\circ}\text{C}$ ).<br><b>Resistance:</b> Alcohol, low pH, drying, freezing. Very stable.                              | Recognized foodborne pathogen in Europe, linked to pork.                    |
| <b>Rotavirus</b><br>(Groups A, B, C)              | Reoviridae<br>dsRNA<br>Non-enveloped         | Human intestinal tract (children).<br>Route: Faecal-oral (handlers, water, food).           | RTE foods, bivalve molluscs, fresh produce.                            | <b>Viral gastroenteritis:</b> Severe watery diarrhoea, vomiting. Major cause of dehydration in children.<br>Onset: ~48 hours. | <ul style="list-style-type: none"> <li>· Reg. (EC) No 852/2004: GHP.</li> </ul>                                                                            | <ul style="list-style-type: none"> <li>· Strict personal hygiene.</li> <li>· Exclusion of ill staff.</li> <li>· Sanitation.</li> </ul>                                               | <b>Inactivation:</b> Alcohol, heating.<br><b>Resistance:</b> QACs, phenolics, low pH, drying, freezing. Very stable.                                             | Mainly concerns children. Vaccines are available.                           |
| <b>Sapovirus</b><br>(SaV)                         | Caliciviridae<br>ssRNA (+)<br>Non-enveloped  | Human intestinal tract.<br>Route: Faecal-oral (handlers, water, food).                      | RTE foods, bivalve molluscs, fresh produce.                            | <b>Viral gastroenteritis:</b> Diarrhoea, vomiting, pain.<br>Onset: ~1-3 days.                                                 | <ul style="list-style-type: none"> <li>· Reg. (EC) No 852/2004: GHP.</li> <li>· Reg. (EC) No 853/2004 &amp; (EU) 2019/627: Rules for shellfish.</li> </ul> | <ul style="list-style-type: none"> <li>· Strict personal hygiene.</li> <li>· Exclusion of ill staff.</li> <li>· Safe sourcing (water, shellfish).</li> </ul>                         | <b>Inactivation:</b> Chlorine, high heat ( $\geq 90^{\circ}\text{C}$ ).<br><b>Resistance:</b> Alcohol, low pH, drying, freezing. Very stable.                    | Less common than Norovirus; affects children/elderly.                       |

| Name                                                            | Morphology                                   | Origin                                                                        | Food Products                                          | Health Effects                                                                                                                                  | Regulation (EU)                                                                                                                                                          | Prevention                                                                                                                                                                | Inactivation Parameters                                                                                                                               | Comments                                                   |
|-----------------------------------------------------------------|----------------------------------------------|-------------------------------------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|
| <b>Astrovirus</b><br>(AstV)                                     | Astroviridae<br>ssRNA (+)<br>Non-enveloped   | Human intestinal tract.<br>Route: Faecal-oral (handlers, water, food).        | RTE foods, bivalve molluscs, fresh produce.            | <b>Viral gastroenteritis:</b><br>Diarrhoea, nausea, vomiting, fever.<br>Onset: ~1-4 days.                                                       | <ul style="list-style-type: none"> <li>• <b>Reg. (EC) No 852/2004:</b> GHP.</li> <li>• <b>Reg. (EC) No 853/2004 &amp; (EU) 2019/627:</b> Rules for shellfish.</li> </ul> | <ul style="list-style-type: none"> <li>• Strict personal hygiene.</li> <li>• Exclusion of ill staff.</li> <li>• Safe sourcing (water, shellfish).</li> </ul>              | <b>Inactivation:</b> Chlorine, alcohol, heating ( $\geq 60^{\circ}\text{C}$ ).<br><b>Resistance:</b> QACs, low pH, freezing, drying. Very stable.     | Common cause of gastroenteritis in children/elderly.       |
| <b>Tick-borne Encephalitis Virus</b><br>(TBEV)                  | Flaviviridae<br>ssRNA (+)<br>Enveloped       | Zoonotic reservoir (rodents).<br>Route: Ticks infect ruminants; shed in milk. | Unpasteurised (raw) dairy products from endemic areas. | <b>Tick-borne encephalitis:</b><br>Biphasic illness, initial flu-like phase, can progress to severe neurological disease.<br>Onset: ~7-14 days. | <ul style="list-style-type: none"> <li>• <b>Reg. (EC) No 852/2004:</b> GHP.</li> <li>• <b>Reg. (EC) No 853/2004:</b> Requires milk pasteurisation.</li> </ul>            | <ul style="list-style-type: none"> <li>• Pasteurisation of milk (critical control).</li> <li>• Avoid raw dairy from endemic areas.</li> </ul>                             | <b>Inactivation:</b> Alcohol, detergents, pasteurization.<br><b>Resistance:</b> Low pH, freezing. Not stable on dry surfaces.                         | Rarer than tick bites.<br>Pasteurisation eliminates risk.  |
| <b>Enteric Adenovirus</b><br>(Serotypes 40, 41)                 | Adenoviridae<br>dsDNA<br>Non-enveloped       | Human intestinal tract.<br>Route: Faecal-oral (handlers, water, food).        | RTE foods, bivalve molluscs.                           | <b>Viral gastroenteritis:</b><br>Prolonged diarrhoea, vomiting, fever.<br>Onset: ~3-10 days.                                                    | <ul style="list-style-type: none"> <li>• <b>Reg. (EC) No 852/2004:</b> GHP.</li> </ul>                                                                                   | <ul style="list-style-type: none"> <li>• Strict personal hygiene.</li> <li>• Exclusion of ill staff.</li> <li>• Safe sourcing (water, shellfish).</li> </ul>              | <b>Inactivation:</b> Chlorine, UV, heating ( $\geq 56^{\circ}\text{C}$ ).<br><b>Resistance:</b> Alcohol, QACs, low pH, freezing, drying. Very stable. | Significant cause of childhood diarrhoea.                  |
| <b>Enteroviruses</b><br>(Poliovirus, Coxsackievirus, Echovirus) | Picornaviridae<br>ssRNA (+)<br>Non-enveloped | Human intestinal tract.<br>Route: Faecal-oral (water, food).                  | RTE foods, bivalve molluscs.                           | Variable:<br>Asymptomatic to severe disease (polio, meningitis, hand-foot-mouth).<br>Onset: Variable.                                           | <ul style="list-style-type: none"> <li>• <b>Reg. (EC) No 852/2004:</b> GHP.</li> <li>• <b>Reg. (EC) No 853/2004 &amp; (EU) 2019/627:</b> Rules for shellfish.</li> </ul> | <ul style="list-style-type: none"> <li>• Strict personal hygiene.</li> <li>• Exclusion of ill staff.</li> <li>• Safe sourcing.</li> <li>• Vaccination (Polio).</li> </ul> | <b>Inactivation:</b> Chlorine, UV, heating ( $\geq 60^{\circ}\text{C}$ ).<br><b>Resistance:</b> Alcohol, QACs, low pH, freezing. Very stable.         | Often spread person-to-person.<br>Polio nearly eradicated. |