

Exotic disease

Infectious pancreatic necrosis**Signs of disease**

Important: Animals with disease may show one or more of the signs below, but the pathogen may still be present in the absence of any signs.

Disease signs at the farm, tank or pond level are:

- sudden and progressive increase in mortality at first feeding of fry, particularly in faster growing individuals
- cumulative mortality rates from 10% to 90%
- low persistent mortality
- fish lying still on the bottom
- fish swimming with a spiralling, corkscrew motion.

Gross pathological signs are:

- long, thin, whitish trailing faecal casts
- swollen abdomen
- darkening body colour
- gills typically pale
- exophthalmos (popeye)
- lesions and ulcers in the pancreas, oesophagus and stomach
- haemorrhages sometimes present in ventral areas, including the ventral fins
- abnormally pale spleen, kidney, liver and heart of fry
- intestines empty or filled with clear mucus.

Microscopic pathological signs are:

- extensive and/or severe necrosis of acinar pancreatic cells
- focal or generalised necrosis of the liver
- sloughing of intestinal mucosa with characteristic 'McKnight' cells in the lumen (eosinophilic and hyaline epithelial cells).

Disease agent

IPN virus is the type species of the genus *Aquabirnavirus* (family *Birnaviridae*). Several serotypes have been identified and these are divided into serogroups A and B. Serotypes are described by their different geographical origins, the most frequently found and highly virulent is the Sp serotype. The signs above are representative of IPN in salmonids.

Infectious pancreatic necrosis in rainbow trout (*Oncorhynchus mykiss*). Note the abdominal distension and darkened body colour



Source: T Håstein

Host range

Species likely to be severely affected by IPN virus are listed below.

Common name ^a	Scientific name
Atlantic salmon	<i>Salmo salar</i>
Brook trout	<i>Salvelinus fontinalis</i>
Brown trout	<i>Salmo trutta</i>
Coho salmon ^a	<i>Oncorhynchus kisutch</i>
Pacific salmon ^a	<i>Oncorhynchus</i> spp.
Rainbow trout	<i>Oncorhynchus mykiss</i>

^a All species listed are naturally susceptible (other species have been shown to be experimentally susceptible).

Presence in Australia

EXOTIC DISEASE—not present in Australia

Other aquabirnaviruses have been identified in farmed Atlantic salmon in Tasmania, Australia, and in diseased turbot and asymptomatic sea-run chinook salmon in New Zealand. The Tasmanian *Aquabirnavirus* is distinct from IPN virus, it is not associated with high mortalities and only occurs in Macquarie Harbour on the west coast of Tasmania.

Epidemiology

- IPN virus is highly contagious and fish that survive following infection are presumed to become carriers. Asymptomatic carrier fish represent a risk for introduction to healthy stocks.
- Viral transmission can occur horizontally; the virus enters fish through the gills or gastrointestinal tract, and vertically; transmitted via eggs of infected carrier broodfish.
- IPN virus is shed in faeces, urine, spawning fluids and external mucus. Spawning favours the transmission of IPN virus with increased levels of virus excreted in spawning fluids.
- Outbreaks of disease are most likely to occur when fish are stressed. Factors raising physiological stress levels include first feeding, high stocking densities, fluctuations in water temperature and salinity and management practices requiring handling of fish. Outbreaks are known to occur at water temperatures as low as 4°C and as high as 18°C.
- The disease can cause high mortalities (70%) in young trout, with cumulative mortalities varying from 10% to 90%.
- The highest mortality rates usually occur in freshwater hatcheries in fry less than 6 months of age. However, IPN is known to affect post-smolt Atlantic salmon after transfer from freshwater to seawater.
- IPN virus can survive in both fresh and salt water environments. It is quite stable and resists destruction by disinfection, thus enabling it to persist in a range of environmental conditions on equipment such as nets and containers.
- Virus may be spread and healthy stocks exposed via contaminated transport water, infected eggs and blood feeding parasites. Piscivorous birds are also known vectors of IPN virus.

Differential diagnosis

The list of similar diseases below refers only to the diseases covered by this field guide. Gross pathological signs may be representative of a number of diseases not included in this guide, which therefore should not be used to provide a definitive diagnosis, but rather as a tool to help identify the listed diseases that most closely account for the gross signs.

Similar diseases

Infectious haematopoietic necrosis, infectious salmon anaemia, viral haemorrhagic septicaemia

Sample collection

Due to the uncertainty in differentiating diseases using only gross pathological signs, and because some aquatic animal disease agents might pose a risk to humans, only trained personnel should collect samples. You should phone your state or territory hotline number and report your observations if you are not appropriately trained. If samples have to be collected, the agency taking your call will provide advice on the appropriate course of action. Local or district fisheries or veterinary authorities may also provide advice regarding sampling.

Emergency disease hotline

The national disease hotline number is 1800 675 888. This number will put you in contact with the appropriate state or territory agency.

Further reading

Further information can be found on the Centre for Environment, Fisheries and Aquaculture Sciences (Cefas) International Database on Aquatic Animal Disease (IDAAD) website at www.cefas.defra.gov.uk/idaad/disoclist.aspx.

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