

## EVENT ABSTRACT

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# Epidemiological investigations into infectious hematopoietic necrosis in South Germany

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Infectious hematopoietic necrosis (IHN) is a disease of salmonids, which can cause high mortality in freshwater aquaculture farms. IHN virus has first been recognised in the USA in the 1950s and spread across North America. In 1987 it was first found in Europe in France and Italy and in 1992 in Germany (Bovo et al., 1987; Enzmann et al., 1992). Most salmonid species are susceptible to IHN virus, with younger animals (fry and fingerlings) being more susceptible than adults. The virus can be spread in faeces, urine and external mucus, especially in young fish. The exhibition of clinical signs depends on the water temperature. If the temperature is between 8°C and 15°C, clinical signs are more likely. Such signs are mostly lethargy, dark skin with pale gills and haemorrhaging at the base of the fins. Necrosis can be found in the hematopoietic organs like kidney and spleen. The mortality described in young fish can be up to 100%. Transmission of the disease can be directly by contact of fish or via water, contact with untreated waste material and through equipment or persons.

IHN is listed as a notifiable list II disease with the OIE and as a non-exotic fish disease in Council Directive 2006/88/EC by the EU (European Commission, 2006; OIE, 2011). According to the health status of the fish farms (compartments) or water catchment areas (zones) are classified into different categories (I to V).

In Germany, especially in the Southwest, control of IHN and VHS has started early on and the federal state Baden-Württemberg has the highest number of EU-approved compartments free of VHS and IHN (category I). In such areas extended biosecurity measures apply, and only fish from other farms with category I health status for VHS and IHN can be brought into the farm.

In 2015 several cases of IHN were reported in the Southwest of Germany. From May to November there were in total 15 cases in 12 farms. Epidemiological investigations were started to identify the connections between the farms and the source of infection. For this reason, all contacts were traced backwards and forwards for extended periods of time on each of the affected farms. Samples were taken from the farms and examined for the presence of IHN virus and the isolates were sequenced to obtain epidemiological molecular data. Farms were visited and detailed questionnaires were filled in together with the farm managers.

Identifying the high-risk period for tracing back and forwards posed several difficulties, due to the fact that the water temperatures rose during summer, thus providing opportunities for the virus to be present on the farm without showing clinical signs. Combining the epidemiological investigations with the data on the virus sequences, several links between the farms could be identified. Mostly the direct transport of fish was identified as the source of infection. On other farms separate farm units were infected subsequently, indicating that indirect contact, despite high biosecurity measures were responsible for the transmission. Other farms bought fish from Denmark, a Member State declared free of IHN, thus only providing the speculation of being contaminated during the transport. Despite extended epidemiological investigations, the original source could not be identified.

Nevertheless, several potential gaps in the biosecurity measures could be recognised on some of the farms, like the collection of dead fish, the unloading of fish brought onto the farm or the disinfection of sport fishing gear.

All farms have been cleared and disinfected before restocking them. Epidemiological investigations will continue into these cases.

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