# Koi herpesvirus (KHV)

## What is KHV?

Koi herpesvirus (KHV) is a virus that infects common carp (*Cyprinus carpio*) and its ornamental varieties, such as koi and ghost carp. Since being first reported from Israel and the USA in 1998, KHV has spread rapidly through the international fish trade, and it is now one of the most important viral diseases of carp worldwide.

*The gills of a common carp showing white patches of necrosis that are characteristic of KHV, and secondary fungal infections*

KHV disease was confirmed in English carp fisheries in 2002, following mortality investigations at a still water. The virus has since spread throughout England. To date, National Fisheries Services (NFS, Brampton) have investigated over 100 cases of KHV, providing support and advice to avoid future losses and get fisheries back on track. The virus is now widespread in England and often triggered by intensive fishery management practices.

## What does KHV do?

KHV is an important pathogen of carp, capable of causing large scale mortality. Fish with KHV disease typically show signs of lethargy, respiratory distress and erratic behaviour. Fish may linger at the water surface, congregate in the margins or collect around water inlet points. Clinical signs of KHV can vary but include severe gill pathology, such as patches of necrosis (cell death) and erosion. These are frequently accompanied by fungal, bacterial and parasitic infections. Other signs of KHV disease include sunken eyes and changes to the internal organs.

## What triggers KHV in your fishery?

KHV is usually triggered by two main factors, temperature and stress. Viruses often have temperature ranges in which they become more active and pathogenic. Outbreaks of KHV generally occur in late spring and summer when water temperatures are between 16°C and 28°C. Outside of these temperatures, the virus may lie dormant without causing problems.

Stress is also a key factor that triggers KHV. There are many factors that can increase stress within the fish population including poor environmental conditions, overcrowding and excessive handling. When temperatures are favourable any increase in stress can trigger a disease outbreak. KHV outbreaks most commonly occur in intensively managed carp fisheries with very high stock densities. Recent stocking can also increase disease risks, although the virus can be present in a fishery for some time before causing problems.

## How is KHV spread?

KHV has spread rapidly following the import of infected fish and is now widespread in England. Fish stocking poses the greatest risk of introducing the disease to your fishery. The difficulty is detecting the virus in healthy fish, as carp may carry the virus without showing signs of disease. It is also possible to transfer the virus on wet fishing tackle, nets and boots, or by the transfer of infected water. Good fishery management and biosecurity are critical in minimising the risk of transferring KHV.

## How is KHV confirmed?

KHV disease can only be confirmed through specific laboratory tests. It is not possible to confirm KHV from the bank side or by external examinations alone. Lethargy and gill necrosis can be caused by many different factors including poor water quality, toxins, algae and diatom blooms, parasites, bacteria and fungi. It is not uncommon to find a range of different infections and problems during KHV outbreaks. Confirming the cause of any disease outbreak requires detailed post mortem examinations combined with assessments of environmental conditions and fishery management practices.

## Is KHV a controlled disease?

Since the detection of KHV in carp fisheries in 2002, control measures have been in place to limit the spread of the virus in England. These were initially placed by the Environment Agency under Section 30 of the Salmon and Freshwater Fisheries Act, 1975. This involved movement restrictions on all waters where the virus was confirmed.

In 2007 KHV became a Notifiable disease under the Aquatic Animal Health (England and Wales) Regulations. This made it a legal obligation to report suspicion of the disease in any farmed or wild fish to the Fish Health Inspectorate (FHI). We support the FHI in controlling notifiable diseases and ensure that all carp mortalities investigated at NFS, Brampton are tested for KHV.

## What about other viruses?

There are many different viruses that can cause disease in fisheries. Examples include the notifiable disease Spring Viraemia of Carp (SVC) and the recently detected Carp Edema Virus (CEV). CEV is a non-notifiable disease that poses additional risks to our carp fisheries. For more information on CEV and

our controls to protect fisheries please see our factsheet 'Carp Edema Virus and other viral diseases of carp'.

## What happens if KHV is found at your fishery?

If KHV is confirmed at your fishery a member of the FHI will contact you and may place movement controls on your water and enforce specific biosecurity measures. You will be fully informed of any actions or restrictions and we will work with you to ensure the best outcome for your fishery. As most KHV outbreaks are triggered by environmental conditions and intensive fishery management, there are things that can be done to limit losses and prevent a re-occurrence of disease.

## This factsheet has been produced by:

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