

# fish health ADVISORY

## VIRAL HEMORRHAGIC SEPTICEMIA



MAY 2007

Wisconsin Department of Agriculture, Trade and Consumer Protection ■ Division of Animal Health

### Report of Viral Hemorrhagic Septicemia in Wisconsin

Anyone who raises, transports, and/or fishes in Wisconsin needs to be aware of the following information provided by the Wisconsin Department of Agriculture, Trade and Consumer Protection's (DATCP) Division of Animal Health. For more information, contact Dr. Myron Kebus, 608-224-4876, [myron.kebus@datcp.state.wi.us](mailto:myron.kebus@datcp.state.wi.us)

Where has viral hemorrhagic septicemia been found?

Viral hemorrhagic septicemia has been reported for the first time in Wisconsin, following the 2005 discovery of the disease in the Great Lakes. On May 11, the Department of Natural Resources and Wisconsin Veterinary Diagnostic Laboratory reported finding the disease in freshwater drum, or sheepshead, in Little Lake Butte des Morts, part of the Lake Winnebago system. Great Lakes waters where VHS has been detected are:

- Lake Huron
- Lake Ontario
- Lake St. Clair
- St. Lawrence River
- Lake Erie

What is viral hemorrhagic septicemia?

VHS is a very serious virus-caused disease of world-wide concern. Fish bleed internally and the majority of infected fish die. While many believed for years that it was mainly a concern for trout, the current outbreak is killing other species. This is apparently a new strain of the virus. *There is no evidence of human health risk from eating infected fish.*

What species are susceptible?

45 species of fish are known to be susceptible to VHS, including these species that are important in Wisconsin:

- Black crappie
- Bluegill
- Bluntnose minnow
- Brown bullhead
- Brown trout
- Burbot
- Channel catfish
- Chinook salmon
- Coho salmon
- Chum salmon
- Emerald shiner
- Freshwater drum
- Gizzard shad
- Grayling
- Haddock
- Herring
- Japanese flounder
- Largemouth bass
- Muskellunge
- Pike
- Pink salmon
- Pumpkinseed
- Rainbow trout
- Redhorse sucker
- Rock bass
- Round goby
- Smallmouth bass
- Turbot
- Walleye
- White bass
- White perch
- Yellow perch
- Rainbow trout

What are the signs of viral hemorrhagic septicemia?

Some fish that die from VHS show no external signs. Others show signs that include bulging eyes, bloated abdomen, inactive or overactive behavior, and hemorrhaging in the eyes, skin, gills, and at the base of the fins. Infected fish may also have lesions that look like those caused by many other fish diseases, so it's necessary to test. Mortality is highest at low water temperatures (37-54 F).

VHSV transmits easily between fish at all ages. The virus is secreted through bodily fluids including urine and blood. It may travel with fish or in water, and may survive for years in fish and days in water. Surviving fish can become lifelong carriers.

VHS requirements for fish farmers

If you import live fish or fish eggs to Wisconsin from any of the other seven Great Lakes states (Michigan, Minnesota, Illinois, Indiana, Ohio, Pennsylvania, New York), they must be accompanied by a veterinary health certificate that includes negative VHS test results within the past year. The USDA sets standards for VHS testing.

If you export live fish or fish eggs, your fish must have tested negative for VHS within the past year. The USDA sets standards for VHS testing.

There is currently no VHS testing requirement for moving fish or fish eggs within Wisconsin. However, you cannot harvest bait fish from the Lake Winnebago watershed, the Great Lakes, or the Mississippi River. If VHS is found in any other Wisconsin waters, this ban will be extended statewide.

Any finding of VHS or suspected VHS must be reported to the U.S. Department of Agriculture (608-270-4000) or the Wisconsin Department of Agriculture, Trade and Consumer Protection (608-224-4872).

VHS requirements for anglers and boaters

It is prohibited to move live fish, including bait, and water from the Lake Winnebago system (see map), the Great Lakes, the Mississippi River, and those waters' tributaries up to the first dam impassible by fish.

If you fish in these waters, you must use minnows purchased only from Wisconsin licensed dealers, or caught in the waters you're fishing.

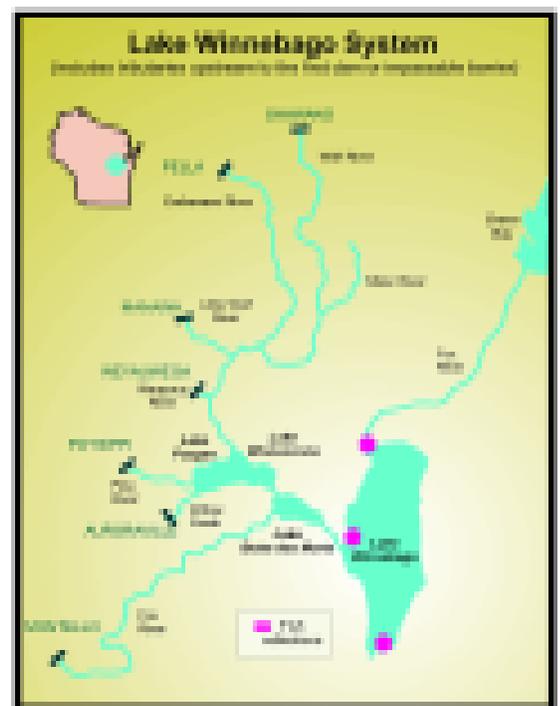
Other recommendations for anglers and boaters

Put your catch on ice and don't take any live fish away from the landing or shore, including unused bait minnows.

Drain water from bilges, bait buckets, live wells and other containers before leaving.

Use live minnows bought only from registered bait dealers in Wisconsin or caught yourself in the same water where you are fishing.

Before launching and before leaving, remove all visible plants and animals from watercraft.



# Biosecurity recommendations for fish farms

General guidelines	<p>Fish farmers need to develop best management practices (BMP) for their specific farms, consulting with accredited veterinarians and other experts, including Wisconsin's fish health veterinarian at the Wisconsin Department of Agriculture, Trade and Consumer Protection.</p> <p>In general, best management practices to prevent VHS should include using equipment and personnel dedicated to one specific site. The next best alternative may be strict, comprehensive disinfection as a standard operating procedure. Contact with tissues and fluids from sick and dead fish should always be viewed as high risk, so BMPs should include practices to prevent transferring the virus via tissues and fluids.</p>
High-risk activities	<ul style="list-style-type: none"><li>• Introducing new fish</li><li>• Sharing gear, equipment, nets and vehicles</li></ul>
Low-risk activities	<ul style="list-style-type: none"><li>• Contact with birds and any other animals besides fish</li></ul>
Fish	<ul style="list-style-type: none"><li>• Never move fish between VHS-suspect/positive sites and sites with unknown disease status.</li><li>• Test for VHS at least once a year.</li></ul>
Hauling vehicles	<ul style="list-style-type: none"><li>• Maintain vehicle-specific gear, equipment and nets.</li><li>• If that isn't possible, disinfect all gear and equipment. (<i>see guidelines on next page</i>)</li><li>• All vehicles should be subject to annual third-party biosecurity audits.</li></ul>
Boats	<ul style="list-style-type: none"><li>• Don't move boats between VHS-suspect/positive sites and sites with unknown disease status.</li><li>• If this isn't possible, thoroughly disinfect boats. (<i>see disinfection guidelines</i>)</li></ul>
Dead fish	<ul style="list-style-type: none"><li>• Remove dead or sick fish as soon as possible.</li><li>• All surfaces that have had contact with tissues and fluids of dead or sick fish should be subject to strict disinfection. (<i>see disinfection guidelines</i>)</li></ul>
Eggs	<ul style="list-style-type: none"><li>• Don't use gametes from individual broodstock that test confirmed positive for VHS.</li></ul>
Personnel	<ul style="list-style-type: none"><li>• Require all your workers to perform complete disinfection procedures when arriving at and leaving a site. (<i>see disinfection guidelines</i>)</li></ul>
Equipment	<ul style="list-style-type: none"><li>• Properly clean and disinfect all equipment after each use. (<i>see guidelines</i>)</li><li>• Do not share equipment between sites.</li><li>• Do not use cracked or leaky equipment.</li><li>• Retire wooden equipment.</li><li>• All surfaces that have had contact with tissues and fluids of dead or sick fish should be subject to strict disinfection. (<i>see disinfection guidelines</i>)</li></ul>
Audits	<ul style="list-style-type: none"><li>• You should conduct a biosecurity audit at least once a year, consulting with accredited veterinarians and other experts.</li></ul>
For more information	<ul style="list-style-type: none"><li>• For more complete information, see chapter 4 of Best Management Practices for Aquaculture in Wisconsin and the Great Lakes Region, a University of Wisconsin Sea Grant Institute publication, available at: <a href="http://aqua.wisc.edu/publications/PDFs/AquacultureBMP.pdf">http://aqua.wisc.edu/publications/PDFs/AquacultureBMP.pdf</a></li></ul>

# Disinfection guidelines for fish farms

- General guidelines** All farms should develop site-specific disinfection programs that address all three phases of disinfection: cleaning, disinfection and isolation. Disinfection programs should:
- Address all current transmission and infection risks.
  - Include quality control and assure proper implementation by including components to ensure all employees recognize the importance of proper disinfection procedures.
  - Include adequate documentation to verify consistent implementation and identify employees responsible for implementation.
  - Use cleaning agents and disinfectants only if they're approved for use by the EPA and USDA.
  - Not include any off-label use of cleaning agents and disinfectants.
  - Be consistent with product manufacturer recommendations for worker health and safety.
  - Comply with EPA regulations pertaining to the discharge of cleaning agents and disinfectants.
  - Be consistent with the guidelines established by the Wisconsin Department of Agriculture, Trade and Consumer Protection's Aquaculture Program, listed below.
- Effective disinfectants** These disinfectants are effective against VHS:
- Virkon® Aquatic
  - Sodium hypochlorite (household bleach) (100-1,000 ppm water for minimum of 10 minutes)
  - Iodophor (100-250 ppm for 10 minutes)
  - Formaldehyde (1.0% for 16 hours)
  - Formic acid (pH less than 4 for 24 hours);
  - Sodium hydroxide (pH greater than 12 for 7 hours)
  - Heat (55C or hotter for 5 minutes or longer)
  - Ozone (8 ppm/min for 3 minutes, corresponding to Redox potential of 600-750mV)
  - UV radiation (120mJ/cm<sup>2</sup>)
  - Sodium thiosulfate can be used to neutralize chlorine or iodine disinfectants.
- Choose disinfectants based on their effectiveness in a particular situation, EPA and USDA approval for that application, and environmental or worker safety risks.**
- Egg disinfection**
- Avoid contaminating gametes with urine, feces, blood or other organic matter during spawning.
  - Rinse fertilized eggs thoroughly with fresh water.
  - Disinfect pre-hardened eggs as soon as possible after fertilization, using a buffered iodophor at a concentration of 100 ppm for 10 minutes.
  - Take great care to separate pre-disinfection activities (dirty area) from fertilized disinfected eggs (clean area). Don't let any equipment or personnel cross these areas.
  - Disinfect eyed eggs using iodophor solution to give 100ppm prior to hatch or movement to another location.
- Equipment**
- Thoroughly clean all equipment, removing all residue, before disinfecting.
  - Remove debris and organic fouling with a brush and/or high pressure hose.
  - Clean equipment using a detergent prior to disinfecting;
  - Clean and disinfect all other equipment used in the cages before using it in another cage.
  - Use separate equipment for separate sites.