

Surveillance for Aquaculture Diseases: Infectious Salmon Anemia and Spring Viremia of Carp

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The Animal and Plant Health Inspection Service (APHIS) has had peripheral involvement with U.S. aquaculture industries for several years. With the enactment of the Animal Health Protection Act of 2002, APHIS' authority over the health of farm-raised aquatic animals became more defined. APHIS is now able to provide assistance to aquaculture industries using programs similar to those offered to traditional livestock industries.

Infectious Salmon Anemia (ISA)

Soon after the Animal Health Protection Act was passed, APHIS instigated its first aquaculture program by assisting the Atlantic salmon farming industry in Maine during an outbreak of ISA. A World Organisation for Animal Health (OIE) reportable disease, ISA is caused by an orthomyxovirus, which is distantly related to influenza viruses. The disease affects primarily farm-raised Atlantic salmon and has been reported from Atlantic-salmon farming areas around the world. In the Americas, ISA was first reported in Canada in 1996. The Canadian salmon farming industry is concentrated primarily in New Brunswick. Although Canada's salmon operations are separated from Maine's by a political border, hydrographically the two industries cannot be considered independent.

When the devastating effects of ISA were first detected in the United States in Maine's Cobscook Bay in 2001, representatives from Maine's salmon industry approached APHIS for assistance. In response, APHIS declared a foreign animal disease outbreak, which enabled APHIS to secure Commodity Credit Corporation (CCC) funding to establish a broad disease management approach in collaboration with Maine State regulators. In early 2002, APHIS and Maine authorities worked to depopulate and fallow the entire Maine salmon-farming area in Cobscook Bay.

The spread of pathogens in water creates new challenges in disease eradication and control. In cooperation with salmon industry, and following the Best Management Practices and Code of Conduct protocols, an industry-wide ISA surveillance program was initiated subsequent to restocking in Cobscook Bay. The surveillance plan requires, at a minimum, monthly sampling at all sites. However, minimum sampling frequencies may increase to weekly intervals, depending on the infection or disease status of a given site. This sampling regime allows for early detection and removal of infected fish, and plays a key role in reducing infection pressure and preventing the spread of the disease to neighboring cages or farms.

Spring viremia of carp (SVC)

Also an OIE reportable disease, SVC affects cyprinid fish such as common carp, including koi, an ornamental variation. SVC was first detected in the United States in 2002 at one of the largest koi production farms in the United States. Affected facilities for that producer consisted of

approximately 204 ponds located in North Carolina and Virginia. These ponds ranged from a half acre to 2 acres in size. As the disease's name implies, SVC is detected most commonly in spring. In fact, it is nearly impossible to detect SVC virus outside a specific temperature range, which, in the Northern United States, typically occurs in spring and fall.

Traditionally, APHIS has focused on diseases of food animals, such as salmon, rather than ornamental species. However, trade in fish such as koi carp is economically important to the United States. Economic considerations, coupled with the U.S. Fish and Wildlife Service's (FWS) concerns regarding the potential effects of SVC on native cyprinids (many of which are endangered), led APHIS to pursue CCC funding to contain and eradicate the disease. Once CCC funding was secured in 2003, APHIS developed a SVC surveillance plan in addition to depopulating, cleaning, and disinfecting the infected koi site.

Since the fall of 2003, APHIS has sponsored a voluntary SVC surveillance program targeting koi carp and goldfish producers. The program's goal is to determine the extent of SVC in the United States. To date, producers in more than 18 States have participated in the program. No new SVC cases have been identified through the targeted SVC surveillance program. However, in the spring of 2004, two new SVC outbreaks were identified independently from the program. One case was confirmed in a backyard hobbyist pond in Washington State; the other case was confirmed on a farm in Missouri. Though neither facility had participated in the APHIS voluntary SVC surveillance program, agency assistance played an integral role in minimizing these outbreaks.

APHIS is continuing its SVC surveillance efforts this spring and will soon partner with FWS to conduct targeted surveillance in wild populations of susceptible fish species. A wild carp die-off in Wisconsin was attributed to SVC in 2002, and a seropositive carp was identified in Illinois following another carp die-off. Both of these epizootics occurred in bodies of water within the Mississippi watershed. APHIS will continue to conduct surveillance to ensure that SVC outbreaks are contained in farmed populations and to determine the extent of SVC virus in wild cyprinid populations.

In addition, a Federal interagency effort between APHIS, FWS, and the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA-Fisheries) is underway to develop a National Aquatic Animal Health Plan (NAAHP). A NAAHP will help regulatory agencies and industry prioritize which diseases of aquatic animals are of concern and provide guidance on how to approach disease surveillance and control. Presently, the three Federal agencies (and many State fish and game or agriculture departments) have a patchwork of management approaches for aquatic diseases. Agencies are collectively challenged as they try to determine how to identify zones of disease freedom, incorporate surveillance data from different sources, identify gaps in data, and assure States and industry that sensitive information will be kept confidential.

Aquaculture remains the fastest growing segment of agriculture in the United States; it encompasses everything from seaweed to alligators, pearl oysters to shrimp, baitfish to tropical aquarium fish, and catfish to salmon. The greatest challenges to serving the needs of the

aquaculture industries—including developing surveillance strategies— are attributable to the variety and scope of species being raised, and to the different needs of these industries.

For more information about APHIS programs for aquaculture industries, please see our Web site at: <http://www.aphis.usda.gov/vs/aqua/index.html> or contact Dr. Jill Rolland at 301-734-7727 or Jill.B.Rolland@aphis.usda.gov.