Ontario Animal Health Network (OAHN)

Aquatic Animal Health

January to June 2017, Report #3

This report is a communication for aquaculture producers in the province of Ontario, compiled by the Ontario Animal Health Network (OAHN).

IN THIS ISSUE:

Aquatic Veterinary Services Disease Summary

There were a number of diagnoses during the period of January to June 2017 in aquaculture production in Ontario. These diagnoses were primarily cold water disease (*Flavobacterium psychrophilum*) and columnaris disease (*Flavobacterium columnare*). Aquaculture veterinary case load increased heading into the warmer months. The majority of the concerns observed on fish farms in Ontario have been non-infectious and related to environmental conditions.

Disease Spotlight: Infectious Pancreatic Necrosis

Infectious Pancreatic Necrosis, or IPN, is a reportable finfish disease caused by a virus. The virus has been confirmed in all Canadian provinces except British Columbia. While it has not recently been diagnosed in the province, it remains a threat to the aquaculture industry as it has been confirmed in local waters.

Which species and ages are susceptible to IPN?
A number of species cultured in Ontario are susceptible to IPN including, rainbow trout, brook trout, lake trout, brown trout, Atlantic salmon and arctic charr among others. Susceptible fish are generally restricted to fry as they appear to gain immunity over 3-4 months of age however survivors of the disease can remain carriers and shed the virus intermittently for long periods of time.

How is the disease spread and can you treat it?
The disease is spread from fish to fish. During an active infection, the virus is passed through the eggs, feces and reproductive fluids. People can also spread the virus through contaminated water, equipment and via transport of dead or live fish. There is no treatment and currently no vaccines are available against IPN virus in Canada. The primary mode of control is to prevent entry of infected fish and eggs. For an active infection, depopulation and decontamination of a facility is necessary to be rid of the disease.

Disease Spotlight: Infectious Pancreatic Necrosis (continued)

What signs should I look for in my fish?
The first sign of disease is generally a sudden increase in daily mortality rate. Cumulative mortality can range from 10% to 90% of the population, either as a chronic low-grade mortality or acute and progressive. Other signs of IPN in salmonids include:

- Fish swimming in a spiral or corkscrew motion (It may be possible to elicit this behaviour by taping the side of the raceway or tank)
- Fish lying still on the bottom
- Decreased appetite
- Long thin trailing fecal casts
- Darkened skin colouration
- Swollen belly filled with fluid (Fig. 1)
- Pale gills
- Popeye (bulging eyes)
- Red skin along the belly and base of the fins
- Empty stomach and intestines filled with clear to milky mucous

Figure 1. Example of rainbow trout with abdominal distention (swollen belly). *Photo Credit: Fish Necropsy Manual* (https://necropsymanual.net/en/)

It is important to note that fish infected with IPN virus may show one or more of the clinical signs described above however fish may still be infected despite not showing any of these clinical signs.

Where can I find more information?
For further information about Infectious Pancreatic Necrosis, please see the CFIA webpage: http://tiny.cc/CFIA_IPN

Your OAHN Fish Network Team:

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Coordinator:
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Provincial Update

The Ontario Ministry of Natural Resources and Forestry (OMNRF) has started a research project which aims to increase the ability to produce Walleye for stocking into public waters to support provincial fisheries management objectives and to improve the ability to produce Walleye fingerlings to support the commercial aquaculture industry.

Walleye (*Sander vitreus*) is one of the most sought after recreational species in Ontario but some populations are in decline. The OMNRF stocks Walleye at different life stages to enhance fishing opportunities and to restore degraded populations. Unfortunately, the OMNRF is not able to meet the current demand for Walleye by stocking using traditional extensive culture methods such as ponds. To address this gap, the OMNRF is developing expertise in the intensive culture of Walleye using indoor systems. They are building upon techniques pioneered in flow through systems by Summerfelt and colleagues in the 1990s and advanced by others in Iowa, Wisconsin and elsewhere.

The ability to reliably grow Walleye intensively from hatch to the autumn fingerling stage would increase the options available to OMNRF to meet stocking targets and would also provide benefits to the commercial aquaculture sector. Two OMNRF Fish Culture Stations are involved in this effort, Blue Jay Creek (Fig. 2) which uses a Recirculating Aquaculture System (RAS) and White Lake which uses a flow through system.

Rearing trials have focused on finding a readily available, high quality, early rearing diet, and on investigating the effects of tank size on growth and survival. To date, there has been significant progress. The flow through system can achieve survival rates comparable to those achieved by counterparts in the U.S. and similar performance is within sight in using the RAS system. Success depends upon careful control of key parameters including turbidity, temperature, light, diet, and feeding regime.

For more information about aquaculture research in Canada, please see the 2017 Canadian Aquaculture R&D review available online: http://tiny.cc/CanAquaRD

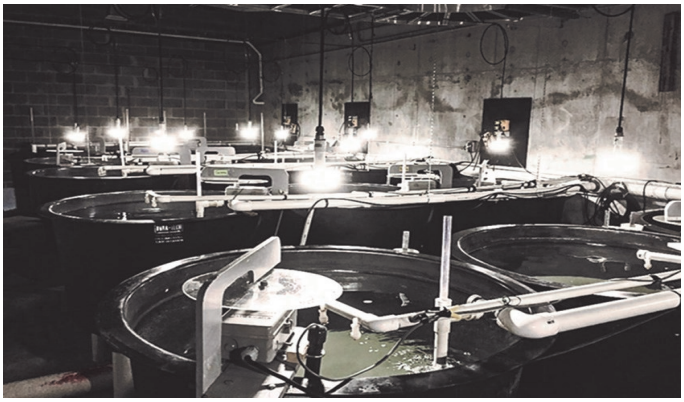

Figure 2. Walleye rearing room at the Blue Jay Creek Fish Culture Station. *Photo credit: OMNRF*

Federal Update

Viral Hemorrhagic Septicemia in Ontario

In May of 2017, the Canadian Food Inspection Agency (CFIA) confirmed an outbreak of Viral Hemorrhagic Septicemia (VHS) in Lake St. Clair (Fig. 3). Lake St. Clair is a freshwater lake that lies between the Canadian province of Ontario and the U.S. state of Michigan. Species of fish affected included American gizzard shad, yellow perch, large-mouth black bass and pumpkinseed sunfish.

VHS is an infectious fish disease and was first detected in Lake Ontario in 2005. The VHS virus has been found in Lake Huron, Lake St. Clair, Lake Erie, Lake Ontario, Lake Michigan, and the St. Lawrence River in New York.

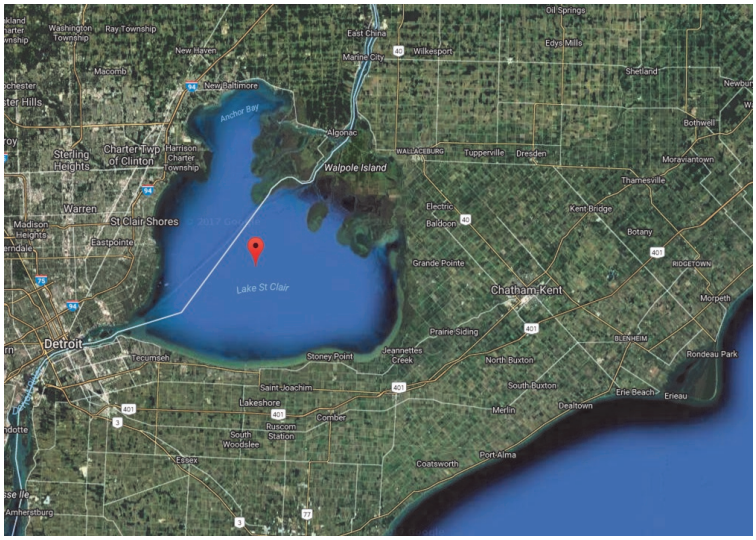

Figure 3. Lake St. Clair is a freshwater lake that lies between Ontario and Michigan.

The virus also has infected several inland lakes in Ontario, New York, Michigan, and Wisconsin. The disease can cause large-scale fish kills and may have severe economic consequences.

Outbreaks of VHS are most common in the spring when temperatures are fluctuating and fish are spawning. Infected fish may show signs of hemorrhages (bleeding) on the body and within the internal organs, pale gills and organs, bloated abdomen, bulging eyes and darker body colour. Some fish show no signs of infection. Confirming VHS infection requires laboratory testing. A diagnosis cannot be made based solely on observation because many different diseases of fish have very similar symptoms.

Aquaculture producers can limit the impact and spread of VHS:

- Develop and implement a fish health management plan, including routine screening
- Contact your veterinarian if you suspect VHS or any illness
- Isolate sick fish to minimize the spread of disease
- Disinfect eggs with an iodine-based solution during the water-hardening stage of fertilization
- Disinfect equipment regularly and install disinfection stations, such as foot baths, at entries and exits
- Control facility effluent to minimize impact on natural water-bodies
- Collect dead fish in secure containers and dispose in landfill or compost
- Prevent predators and scavengers from gaining access to fish

Figure 4. Fish with signs of VHS in Lake St. Clair. *Photo Credit: Michigan Department of Natural Resources*

Federal Update (continued)

Whirling Disease in Canada

The Canadian Food Inspection Agency (CFIA) confirmed the presence of Whirling Disease, a federally reportable disease under the Health of Animals Act, in Banff National Park in August of 2016. Whirling disease is an infectious disease of finfish that affects trout and salmon that caused by a microscopic parasite, *Myxobolus cerebralis*. This was the first outbreak of whirling disease in Canada.

Since the first confirmed case was detected in Johnson Lake, the CFIA have declared Bow, Oldman and Red Deer River watersheds infected with whirling disease. The rest of Alberta has been declared as a buffer area for this disease until surveillance by the CFIA, Parks Canada and the Government of Alberta determines that the buffer area or parts of the buffer area are either free or infected with whirling disease through diagnostic testing.

As a result of the new declaration, a domestic movement permit will be required from the CFIA for the movement of susceptible species, the vector *Tubifex tubifex*, the disease causing agent *Myxobolus cerebralis*, and/or related things out of the infected and buffer areas of Alberta.

The following are examples of facilities and activities that will require a permit:

- Provincially-licensed aquaculture facilities in Alberta wanting to move live or dead finfish or gametes for cryopreservation, culture, research, and release into natural waterways.
- Diagnostic laboratories receiving live or fresh dead or frozen finfish, or the pathogen of whirling disease from the Bow River watershed or from Alberta.
- Other types of laboratories that participate in water toxicity or benthic testing programs, for example, and are receiving live or fresh dead or frozen finfish, or freshwater sediments.
- Research activities that utilize live or fresh dead or frozen finfish, the vector of whirling disease, the pathogen of whirling disease, or freshwater sediments from the Bow River watershed or from Alberta.

Affected finfish may exhibit unusual behaviour such as swimming in a whirling pattern and skeletal deformities of the body or head. However, not all infected finfish show signs of disease therefore the diagnosis of whirling disease requires laboratory testing. Whirling disease is a cause of death in the younger life stages of susceptible freshwater finfish and overall deaths of infected fry and fingerlings can reach 90 percent.

For more information, please go to the CFIA webpage: http://tiny.cc/CFIA_WD

Contact OAHN:

Check us out on the web:
www.oahn.ca

Follow us and receive disease updates and more!

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Ontario Animal Health Network

Email:
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Federal Update (continued)

Notice to Industry – Change to certification requirements for export to USA of live finfish (salmonids) and their fertilized eggs, and dead uneviscerated salmonids and their offal

In April of 2017, the CFIA was informed by the U.S. of changes in the export certification process for exports of live finfish, including salmonid species, to the U.S. This change also applies to germplasm or genetic material for culture, stocking, enhancement and research and dead uneviscerated salmonids or parts thereof (including offal) for any end use.

Effective immediately, following U.S. Code of Federal Regulations, export certification must be provided by private certifying officials approved by U.S. Fish and Wildlife Service (US-FWS) using private, non-government laboratories for all required diagnostic testing. As a result, the CFIA is no longer responsible for providing export certification or diagnostic testing services for export of these commodities to the U.S.

Canadian exporters are advised to contact private veterinarians or fish health professionals that may be interested in applying to the US-FWS for approval to become a certifying official. Exporters should also contact private diagnostic labs in Canada that might be interested in conducting the diagnostic testing for export. Exporters should advise their US importers to contact their local US-FWS office with any questions or concerns.
For more information, please go online at http://tiny.cc/UScert.

Pending Federal Changes to Address Antimicrobial Resistance

The increase of antimicrobial resistance is a global concern and its effects on human and animal health have been raised by experts at local, national and international levels. The federal government is working to control antimicrobial resistance and promote improved antimicrobial stewardship in both humans and animals. Health Canada has announced how it is taking action to help reduce the use of antimicrobials in animals and enhance veterinary oversight:

1. Growth promotion claims will be removed from all veterinary products containing antimicrobials that are important to human medicine by December 2018.
2. Approvals and access to low-risk veterinary health products such as 'nutraceuticals' will be improved to give producers greater access to a broader range of products for animal health and welfare by November 2017.
3. "Own Use Importation" of products containing antimicrobials that are important to human medicine will no longer be permitted by November 2017. National producer organizations will be consulted on products that would be exempt, but no products containing antimicrobials will be eligible for exemption.
4. Active pharmaceutical ingredients/drug components will only be available to import by those licensed to compound drugs by May 2018. Producers will no longer be able to import active ingredients to mix on farm.
5. Reporting of veterinary antimicrobial sales will be mandatory from manufacturers, importers and compounders of veterinary antimicrobials beginning with sales year 2018.

Federal Update (continued)

Pending Federal Changes to Address Antimicrobial Resistance

6. Enhancement of veterinary oversight by moving all antimicrobials that are important to human medicine to the Prescription Drug List. A veterinary prescription will be required for purchase of these products by December 2018. This means that producers will no longer be able to purchase them over-the-counter at Livestock Medicines Outlets. They will need to have a relationship with a veterinarian, obtain a veterinary prescription and purchase these products via a veterinarian or pharmacist. Antimicrobials will still be available at feed mills in mixed feed with a prescription. Producers should discuss delivery options with their veterinarian if there are concerns about distance or timely treatment.

Products containing the following active ingredients will require a prescription:

- Apramycin
- Bacitracin
- Erythromycin
- Lincomycin
- Neomycin
- Penicillin G
- Spectinomycin
- Streptomycin/Dihydrostreptomycin
- Sulphonamides
- Tetracycline/Chlortetracycline/Oxy tetracycline
- Tilmicosin
- Tiamulin
- Tylosin/Tylvalosin
- Virginiamycin
- Or their salts or derivatives

Ionophore products and coccidiostats will NOT be affected by this change.

For more information about changes to federal policy and the regulations related to antimicrobial use and resistance, please review the Government of Canada's response to antimicrobial resistance, available online at: http://tiny.cc/AMR_CAN

To comment on the switch for Medically Important Antimicrobials to the Prescription Drug List by September 18, 2017, please review the Notice of Consultation – Prescription Drug List Veterinary and Human Antimicrobials, available online at http://tiny.cc/AMR_Consultation

To review OMAFRA's evolving approach to complement federal changes to address antimicrobial resistance, please visit: http://tiny.cc/OMAFRA_AMR

Update on the OAHN Research Project:

Antimicrobial Resistance in Ontario Aquaculture

The intent of the project is to gain a baseline understanding of the degree of antimicrobial resistance in common bacterial pathogens in the Ontario aquaculture industry. The importance of acquiring and tracking this type of data over time includes developing disease prevention programs in order to decrease the use of therapeutants in food fish, tracking resistance to therapeutants and adapting treatment protocols. Fish were collected from commercial aquaculture farms and from government hatcheries run by the MNRF. In most cases, whole fish specimens were submitted to the Animal Health Laboratory for bacterial culture. In some cases, archived isolates from prior MNRF testing were submitted. Bacterial cultures were routinely cultured on agar and were then identified.

Update on the OAHN Research Project:

Antimicrobial Resistance in Ontario Aquaculture (continued)

Those considered primary fish pathogens were further tested for minimum inhibitory concentrations (MICs) which is the lowest concentration of an antimicrobial that will inhibit the visible growth of a microorganism after overnight incubation. MICs are used by diagnostic laboratories mainly to confirm resistance. To date, a total of 64 cases were submitted for bacterial cultures and 62 of these were positive for fish pathogens. Many cases were positive for more than one pathogen.

The majority of the cases to date have been positive for *Aeromonas* and *Flavobacterium* species. To date, most of the common bacterial pathogens observed in Ontario have not shown resistance to the antibiotics typically used in the treatment of diseases in aquaculture production. However, the results of MIC testing indicate that some of these pathogens are intermediately sensitive or resistant to common treatments like oxytetracycline and florfenicol (Aquaflor). In particular, the bacterial pathogen which causes cold water disease, *Flavobacterium psychrophilum*, demonstrated intermediate sensitivity to florfenicol which may indicate future resistance problems. The causal agent in columnaris disease however, *Flavobacterium columnare*, remains sensitive to treatment by oxytetracycline. These findings demonstrate the importance of routine antimicrobial resistance testing in a facility where there is regular use of antibiotics for a narrow spectrum of diseases.

Don't forget to take advantage of the OAHN subsidy for veterinary services!
To encourage the submission of more specimens from producers and to increase the sample size, OAHN will be subsidizing veterinary services in 2017. Subsidies are available until December 31, 2017 or until the project funds are exhausted, whichever comes first.

What does this mean for producers?

- If you use a veterinarian to submit fish samples for testing, the OAHN project funds will cover 75% of veterinary service & diagnostic fee pricing, in addition to covering 100% of the cost of MIC testing.
- Producers are responsible for covering the cost of 25% of the total bill for veterinary services and diagnostic fee(s), in addition to 100% of costs associated with travel & accommodations for the veterinarian.

How to Qualify:
Establish contact with an Ontario-licensed veterinarian and arrange consultation/ sample submission through the veterinarian. Samples must be submitted to the University of Guelph's Animal Health Laboratory.
For more information, please contact us at oahn.fish@uoguelph.ca

Made Possible Through Funding From:

- Province of Ontario
- Ontario Disease Surveillance Program
- University of Guelph

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