



Ontario Animal Health Network (OAHN)

Fish Expert Report

January to July 2016, Report #1

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Executive Summary

This report is a communication for aquaculture producers in the province of Ontario, compiled by the Ontario Animal Health Network (OAHN) Fish Expert Group. Aquaculture veterinary case load has increased from the winter months heading into spring and summer. To date in 2016, the majority of the fish issues observed have been non-infectious and related to environmental conditions.

Aquatic Veterinary Services Disease Summary

There were a number of diagnoses during the period of January to July 2016 in aquaculture production in Ontario. These diagnoses included:

Aeromonas hydrophila - a species of bacteria found in both fresh and brackish water. Infected fish develop ulcers, tail rot, fin rot, and hemorrhagic septicemia. Hemorrhagic septicaemia causes lesions that lead to scale shedding, hemorrhages in the gills and anal area, ulcers, exophthalmia, and abdominal swelling.

Flavobacterium spp. - there were a number of cases this quarter involving species of *Flavobacterium*. The isolates were cultured from generally unhealthy fish and included *F. psychrophilum*, causing bacterial cold water disease, *F. columnare*, causing columnaris disease and *F. aquidurensis*. The significance of the presence of *F. aquidurensis* in unhealthy fish is unknown at this time. It is not currently recognized as a fish pathogen; however, there is some suspicion that *F. aquidurensis* may be an emerging pathogen in Ontario aquaculture. An atypical presentation of infection with the bacterium *F. psychrophilum* was diagnosed. This presented as proliferative hyperplasia of the gill lamellar epithelium; the disease is known as 'atypical bacterial gill disease'. It can be triggered by stressors (crowding, low dissolved oxygen, ammonia buildup, etc.) that result from intensive culture.

Aquatic Veterinary Services Disease Summary (continued)

Ich' infection - The disease is caused by a ciliate protozoan (*Ichthyophthirius multifiliis*), and is characterized by white spots on the body surface. Ich is highly contagious, spreads rapidly via infective stages in the water column and can be particularly damaging in intensive culture as it is capable of causing massive mortality within a short time.

Ichthyobodosis - caused by a flagellate protozoan (*Ichthyobodo* spp., formerly named *Costia*) and is typically seen when there are high stocking densities and suboptimal water quality. Characterized by a light blue hue over the body surface, swollen gills, increased mucus secretion and fin damage.

Trichodinosis - also referred to as slime disease, is one of the protozoan diseases caused by ectoparasitic ciliates called *Trichodina* spp. It can be diagnosed based on the identification of the protozoan parasites on the skin scrapings and gill arches. The disease manifests in the form of restlessness, loss of appetite, loss of condition, excessive mucus secretions and signs of irritation including swimming near borders and scratching against hard objects.

Yersinia ruckeri - a species of bacteria, known for causing enteric red mouth disease, which affects mainly salmonid fish. The bacterium is shed in the feces of infected fish and the disease can be transmitted by water. *Yersinia ruckeri* is able to survive for long periods of time (more than 4 months), especially after an outbreak of the disease. It is an annually notifiable disease in Canada.

Also of note, a few cases of mycotic branchitis, unknown bacterial branchitis and unknown bacterial dermatitis. Producers should be aware that clinical signs and lesions are not diagnostic and that laboratory work is required to make a diagnosis.

Provincial Update

In April 2014, responsibility for the *Fish Inspection Act* & Fish Interim Audit Program was transferred from the Ministry of Natural Resources and Forestry (MNRF) to the Ministry of Agriculture, Food and Rural Affairs (OMAFRA).

Since the legislative transfer, OMAFRA has been administering the audit program for approximately 100 non-federally registered fish processors, providing food safety direction, providing advice to non-federally registered fish processors and additional resources about fish inspection in Ontario.



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Provincial Update (continued)

The Ontario government is now seeking input on a proposal to modernize the fish food safety regulation for non-federally registered fish processors in Ontario. It is proposed that Ontario's *Fish Inspection Act* and regulation be replaced with a new regulation under the *Food Safety and Quality Act*.

For more information and to provide comments and feedback on proposed changes, please go to the OMAFRA webpage: <http://www.omafra.gov.on.ca/english/food/inspection/fishinspection.htm>

Federal Update

Domestic Disease Control Program

The federal domestic disease control program was launched on December 31, 2015 by the Canadian Food Inspection Agency (CFIA). A CFIA movement permit is required if the declared aquatic animal or thing is moving from:

- a declared infected area to a declared buffer area, provisionally-free area or free area;
- a declared buffer area to another declared buffer area, provisionally-free area or free area;
- and a declared provisionally-free area to a declared free area.

In Ontario, movement permits are only required for shipments of animals or things out of the Atlantic Ocean watershed into the Hudson Bay watershed, or for inter-provincial movements. For more information, please go to the CFIA webpage: <http://inspection.gc.ca/animals/aquatic-animals/domestic-movements/eng/1450122972517/1450122973466>

Regulatory and Policy Initiatives for Combatting Antimicrobial Resistance

On July 2nd, 2016, the federal government provided notice in the Canadian Gazette of its intent to make amendments to the Food and Drugs Regulations to improve regulatory oversight of antimicrobials for veterinary use. This includes a plan to strengthen veterinary oversight of medically-important antimicrobials used in food animal production by moving all over-the-counter antimicrobial products to the prescription drug list. This change would require producers to have a prescription from a veterinarian in order to purchase antimicrobial drugs. This may affect fish producers who don't have a veterinarian-client-patient relationship who normally purchase products like oxytetracycline from a registered livestock medicines outlet in Ontario.

For more information, please go to the Government of Canada's webpage: <http://www.healthycanadians.gc.ca/health-system-systeme-sante/consultations/veterinary-drugs-antimicrobial-resistance-antimicrobiens-medicaments-veterinaires/index-eng.php>

Federal Update (continued)

First case of whirling disease in Canada

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

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.

Whirling disease is not spread directly between finfish. The parasite is spread through contact between finfish and a freshwater worm. Whirling disease can be spread by moving any of the following:

- infected live or dead finfish,
- infected worms,
- contaminated equipment, or
- contaminated water.

For more information, please go to the CFIA webpage: <http://www.inspection.gc.ca/animals/aquatic-animals/diseases/reportable/whirling-disease/eng/1336685663723/1336685826959>

OAHN Research Project: Antimicrobial Resistance in Ontario Aquaculture

Currently, there are very few antimicrobial drugs licensed in Canada for food fish production under the federal *Food and Drug Act* and data on the emergence of antimicrobial resistance for these products is unavailable for Ontario. As antimicrobial resistance develops in aquaculture production, antimicrobial compounds will lose their effectiveness, and currently treatable diseases may become difficult to treat and manage. The continued emergence of resistant bacteria, along with a lack of new antimicrobials on the market, poses a risk to both the industry and to animal health.



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Made Possible Through Funding From:

- Government of Canada
- Growing Forward 2
- Province of Ontario
- Ontario Disease Surveillance Program

OAHN Research Project: Antimicrobial Resistance in Ontario Aquaculture (continued)

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.

To accomplish this, we are testing specimens that have been submitted to the Animal Health Lab as part of regular screening and fish health testing. Any submitted specimen that is found to be positive for bacterial pathogens will be tested for minimum inhibitory concentrations (MICs) to monitor for resistance to antibiotics. MICs are defined as the lowest concentration of an antimicrobial that will inhibit the visible growth of a microorganism after overnight incubation.

While this work has only recently begun and the sample size is still relatively low, the project has provided some interesting results. To date, most of the bacterial isolates described above (see *Aquatic Veterinary Services Disease Summary*) have not shown resistance to the antibiotics typically used in the treatment of diseases in aquaculture production. However, one isolate of *F. psychrophilum* collected in this work demonstrated intermediate sensitivity to florfenicol (Aquaflor) which is typically used to treat bacterial cold water disease. This may indicate future resistance problems. Furthermore, oxytetracycline is typically used in the treatment of enteric red mouth disease but one isolate of *Yersinia ruckeri* was found to show resistance to oxytetracycline. Florfenicol appeared to be a better choice based on the tests done in this work. 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.

The results of this project will benefit all levels of interest within the Ontario Animal Health Network; both hatcheries and producers will have valuable information to encourage the development of disease prevention programs in order to decrease the use of therapeutants in food fish and adapt treatment protocols. We will continue to report the results of this work as it becomes available and will notify the industry of new and emerging issues with antimicrobial resistance. Veterinarians and government agents will have the ability to monitor trends in the province. Overall, this can minimize the spread of disease, decrease treatment costs and use of medication which then reduces the chance of pathogens developing resistance to treatments.

