October 2020

PILCHARD ORTHOMYXOVIRUS (POMV)

- POMV is a virus, naturally occurring in wild pilchards in Tasmania's waters.
- The available science indicates that POMV is transferred from wild pilchards to salmon with pilchards being the original source of the virus (given they are small enough to swim through the nets on salmon farms). Given that pilchards are widely distributed in Tasmanian waters and are the original source of POMV, wild fish populations (including Brown trout) are potentially exposed to this endemic disease wherever pilchards are also present.
- POMV has probably been in pilchards for a very long time. There are many potential disease agents in wild fish populations that go undetected until fish are tested for some unrelated reason like a mass mortality (ie algae bloom or other disease). It is also the case that diagnostic tests are rapidly improving which means that disease agents previously not detected are now being found using advanced DNA methods.
- It is important to note that no reports have been found of pilchards dying from POMV anywhere in Australia.
- POMV was first discovered in Australia in 1998 in pilchards in South Australia. At that time, there were largescale deaths of pilchards caused by a herpes virus and POMV was also found in these fish. POMV was first detected in Tasmania in 2006 in Atlantic salmon farmed in the Tamar River. The first outbreak of POMV in Atlantic salmon in the south east of Tasmania occurred in 2012.
- The salmon industry in collaboration with the Tasmanian Government and the Fisheries Research and Development Corporation (FRDC) has invested millions of dollars in the development of the Centre of Excellence for Aquatic Animal Health and Vaccines (CEAAHV) in Launceston. This is a world-class aquatic animal diagnostics and health related research facility which plays an important role in assisting the Tasmanian industry to stay at the forefront of fish health, welfare and biosecurity.
- In 2019, Huon vaccinated the first cohort of smolt with prototype POMV vaccines developed by the CEAAHV. The entire 2020-year class smolt has also been vaccinated with the most up to date prototype POMV vaccine.

FISH HEALTH AND WELFARE

All good farmers take a proactive and holistic approach to safeguarding the health and welfare of their stock. Effective management of fish health, welfare and biosecurity is critical to successful aquaculture. At Huon, this involves feeding quality diets, good site management, fish husbandry, biosecurity measures and of course, vaccinating our stock.

The welfare of our fish is a priority for us; every farmed animal has the right to move and behave normally—this is a core principle of RSPCA's Approved Farming Scheme of which Huon is the only seafood producer to be granted membership.

Controlling POMV, as with any livestock disease, requires strong biosecurity practices. Key measures include keeping different groups of fish separate from each other to minimise the chance for the infection to be spread. It is critical to keep young fish separated from older fish, particularly if they have had POMV at some earlier stage. It is also important to clean and disinfect equipment. Essentially good biosecurity for POMV involves the same measures that people would be familiar with for minimising the spread and severity of influenza in people (or the coronavirus!).

GENERAL VACCINE DEVELOPMENT

Vaccination is a key strategy in the sustainable production of farmed fish in Tasmania and millions of dollars have been invested in vaccine development across the salmon industry, with vaccines now commercially used to successfully control up to five serious disease pathogens including POMV.

Fish, just as any other animals, are susceptible to infectious diseases caused by naturally occurring viruses, bacteria or parasites. The effects of disease are more pronounced and can have greater impact when animals are kept together, such as in a pen. Vaccination is a preventive measure intended to protect farmed animals from becoming diseased. This means that fish are vaccinated before they are at risk of becoming infected. Using effective vaccines can eliminate the need for antibiotics as a means of treating disease.

Vaccines contain either killed microorganisms or parts of microorganisms. When these are introduced to fish their immune system is activated. Fish, like other animals, have a well-developed immune system that protects them from disease. Vaccination trains the immune system to protect fish from disease. Fish have a full repertoire of immune functions including antibodies, cell-mediated activity through to the production of interferons. All these components of the immune system are activated by vaccination and help protect the animal from disease. Protective immunity develops 4-6 weeks after vaccination.

For injection vaccines in Tasmania, protection is life-long. Most fish are vaccinated by injection. At the time of vaccination, fish are gently sedated and then a tenth of a millilitre (about the size of a drop of water) is injected into the body of the fish. There are times when smaller fish, 5-10g in size, need to be vaccinated. Injection is impractical for fish this small, so they are dipped in a bath of the vaccine for 30 seconds.

Most fish disease in Tasmania occurs at sea. Between 6-8 weeks before fish become smolt and are sent to sea, they are vaccinated. For hatchery diseases, fish are vaccinated once they are considered immune competent and able to benefit from vaccination, typically when they reach 5g.

For more information on fish vaccines used in Tasmania refer to https://dpipwe.tas.gov.au/biosecurity-tasmania/animal-biosecurity/animal-health-laboratories/centre-for-aquatic-animal-health-and-vaccines

References:

- https://en.wikipedia.org/wiki/Infectious_salmon_anemia_virus
- https://www.researchgate.net/publication/288503298_Report_into_the_epidemiology_and_control_of_an_outbreak_of_infectious_salmon_anaemia_in_the_Shetland_Islands_Scotland
- http://www.cfsph.iastate.edu/Factsheets/pdfs/infectious_salmon_anemia.pdf