PRV & HSMI summary of facts

Aquaculture can transfer diseases with potentially serious negative consequences to wild species:

> "I therefore conclude that the potential harm posed to Fraser River sockeye salmon from salmon farms is serious or irreversible. Disease transfer occurs between wild and farmed fish, and I am satisfied that salmon farms along the sockeye migration route have the potential to introduce exotic diseases and to exacerbate endemic diseases that could have a negative impact on Fraser River sockeye."
>
> — Cohen Commission Final Recommendations, Vol. 3, page 6, column 1

What is piscine reovirus (PRV)?

Piscine reovirus was discovered in 2010 and is thought to cause a severe infectious fish disease known as Heart and Skeletal Muscle Inflammation (HSMI).[1]

What is Heart and Skeletal Muscle Inflammation (HSMI)?

HSMI is an infectious disease syndrome first observed in farmed Atlantic salmon in a single fish farm in Norway in 1999. There are now 419 farms infected with HSMI in Norway.

Not all fish that develop HSMI die from the disease. Farm salmon with the disease, HSMI, are seen lying on their sides on the bottom of the net cage still alive, but too weak to move.[2] Farm fish with HSMI may recover, but wild salmon with HSMI would be extremely vulnerable to predation if found lying on their side, on the seafloor.

The relationship between PRV and HSMI

In 2010 scientists at Columbia University, and from Norway, identified the piscine reovirus as potential causative agent of HSMI.[1]

The symptoms of HSMI occur 5-9 months after seawater transfer.[3] Therefore, smolts leaving a hatchery infected with PRV would not appear sick. Not all fish that test positive for PRV develop the disease HSMI. In fish farms, the PRV positive fish appear to develop HSMI after entering the net pen - perhaps due to the addition of another external factor such as stress.[5]

PRV is a durable virus, meaning it is tough to damage, increasing the chance of it moving with currents and infecting other fish.

Piscine reovirus is contagious and appears able to transfer from farmed to wild fish

PRV has spread rapidly through Norwegian farms:

1999 – first noticed[1]
2002 – 41 farms infected[6]
2007 – 162 farms infected[6]
2010 – 419 farms infected[1]

Salmon caught in the Broughton Archipelago in 2008 and frozen for research purposes tested negative for PRV[7]. In 2012, fish from the same region tested positive for the virus.

The scientists that uncovered the association between PRV and HSMI warned: "it is urgent that measures be taken to control PRV … due to the potential for transmission to wild salmon populations."[1] He cautions that "if the potential hosts [fish] are in close proximity it goes through them like wildfire"[8].

The strain of PRV found recently in both farmed and wild fish in B.C. is very close to the strain found in Norway. As all viruses mutate over time, the published evidence to date suggests that the strain of PRV detected in wild and farmed salmon in 2012 was recently introduced – likely around 2007 into Pacific coastal waters. The results of this analysis were published in 2013 in the Virology Journal.[4]

The results of recent unpublished testing by British Columbia's provincial pathologist suggest that historical samples of persevered fish have tested positive for PRV. That sampling did not include a whole genome analysis. Thus, it is not possible compare these historical tests to the Norwegian strain.

In conclusion:
Given what we already know about PRV and HSMI, it is imperative that we proceed with caution and take steps to isolate fish infected with PRV from healthy wild salmon populations.

This must start by keeping fish infected with PRV out of the ocean.

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