

Public Submission to the Cohen Commission

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ISAV Hearings and Evidentiary Matters

I, and many members of the public, await with interest the expert testimony and evidence to be presented in the extra scheduled hearings. We are grateful that the Cohen Commission has seen fit to address the ISAV issue.

That said, the run up to the hearings has been marked by an extraordinary media debate on both sides of the US border on existence of, or denial of, the presence of ISAV or a similar virus in wild fish in British Columbia.

Among the many recommendations likely to flow from the Cohen Commission, one I would urge is that the various molecular biologists, here in BC, in the US and in Norway (among others) develop a Code of Practice and Performance Standards for Forensic Molecular Biologists (for that is what the experts are) to address ISAV and other viruses.

A second recommendation would be that the testing laboratories be independent of the regulatory agencies and be overseen by an independent scientific panel.

A third recommendation would be that if there is even a small probability of a virus being present in the wild salmon population, that the existing fish farms be isolated from the migratory routes of wild salmon on both economic and ecological grounds.

General Comment

While nobody can predict how the pending ISAV testimony will unfold, several elements are of concern to bystanders, including myself.

- 1) I, and many other observers, are alarmed and perplexed by the strident tone adopted by the triumvirate of Canada, BC and the BCSFA. They deny that there is any virus present in the west coast and that their sampling protocols are superior, correct and error free. Evidently they are the one and only true science organization (in their mind) and uncertainty is merely an abstract ploy of their opponents. They have not avoided the *ad hominem*, pejorative and nasty comments between those with disagreements – or so it seems to this outside observer. I am not convinced that this is a correct representation of the world of molecular biology as it applies to B.C.
- 2) The DFO seems more interested in regulatory, political and scientific hegemony than an earnest search for truth. Further, the DFO and farmed fish organizations seem to have a very coherent view of regulatory risk, a view not shared, evidently, by the farm fish opponents or US regulators and politicians.

- 3) The recent revelation (in US media) that the DFO evidently had direct or circumstantial evidence of the existence of a virus among wild salmon as far back as 2004 but somehow neither pursued a scientific explanation for the results, nor communicated the uncertainties of molecular biology to stakeholders at home and abroad. This seems to me not to be the epitome of open, transparent and accountable scientific governance.
- 4) Uncertainty is the norm in science, and the existence of uncertainty is the spur to research. This was elegantly described by Krebs (2011)¹. Krebs went on to describe one important role for scientists in the interpretation of their risk assessment, which is to help policy-makers understand how far scientific understanding has evolved in a policy landscape. Krebs does describe a situation not dissimilar from the ISAV issue where the fact that though scientists may disagree is not helpful to policy-makers, Krebs emphasises that challenge and disagreement is a central part of the process of scientific discovery.
- 5) We are precisely in the same valley of disagreement, despite the earnest protestations of the DFO. Policy makers always wrestle with the element of disclosure. Even if the regulator is of the view that there is no risk, taking or not taking further steps is critical where there is ambiguous or uncertain data. What is now described in the US media are DFO documents that show some test results from 2004 that provided indications of an ISAV-like virus. DFO (evidently) did not disclose this information until very recently. Presumably the DFO did not want to instill fear and panic in 2004, but by burying this information, DFO may have inadvertently created a firestorm. Now that this preliminary report is circulating in the US media, the conspiracy and cover up arguments have emerged with attendant collapse in public confidence in the DFO. Had there been an element of communication in 2004, and subsequent follow up science studies, this approbium might have been avoided by the DFO. The DFO, arguably, just did not act responsibly (in my opinion)
- 6) One way out of the credibility gap might have been the production of an agreed on common expert among the parties on molecular genetics to advise and testify to the Commission and the stakeholders on the facts and scientific settings for ISAV research. In my view, Canada and BC have missed a golden opportunity to bridge the scientific gap.
- 7) Instead, we may have a war (seemingly) of experts with no clear consensus. We know from the DFO and CFIA pronouncements of the past week that they believe there is no ISAV in BC despite the other indications of a salmon virus of some type. We also know from the scientific literature that there are limited correlations and reproducibility between ISAV labs but a degree of consistency within labs.² The authors of this report stressed that repeatability within labs was high but reproducibility between labs was not high.

¹ (2011) **REVIEW. Risk, uncertainty and regulation.** JOHN R. KREBS* *Phil. Trans. R. Soc. A* (2011) **369**, 4842–4852 doi:10.1098/rsta.2011.0174

² (2011) **Infectious Salmon Anaemia Virus (ISAV) Ringtest: Validation of the ISAV Diagnostic (sic) Process using Virus-spiked Fish Tissues and ISAV TaqMan® Real-time RT-PCR** Frederick S .B Kibenge, Molly J.T Kibenge and Elmabrok Masaoud . *J Aquac Res Development* 2011, 2:2 <http://dx.doi.org/10.4172/2155-9546.1000110>

Which is why casual observers like myself will look forward to the DFO testimony on why they consider their results as superior to everyone else's without ever doing a full independent phase of round robin testing.

- 8) One outcome of the Cohen Commission would be a recommendation that Canada, the US, the EU develop a *Code of Practice and Performance Standards for Forensic Molecular Biologists*, akin to the agreed on standards for forensic pathologists in the criminal law.
- 9) I, and others, look forward to the ISAV testimony in the belief that the Commission's gatekeeper role will ensure that the testimony and evidence will be reliable, relevant and necessary. Despite the strong comments of the DFO, I do not believe that ISAV science studies outside the DFO are inherently unreliable, untested or novel.
- 10) A significant element of the Cohen Commission has been the dichotomy between scientific and legal standards of proof. With respect to the ISAV issue, the position of Canada, BC and the BCSFA is largely based on results provided by laboratories under the control of the regulator. With all respect to the integrity of the DFO scientists, the possibility of bias, knowing or unknowing is a real and present danger, especially considering the economic implications of the presence or absence of potentially lethal viruses. Issues around legal standards for forensic pathology (for much of the salmon molecular genetics is precisely the same) have been canvassed in detail by an Inquiry Commission in Ontario (the Goudge Report)³ and by a National Academies of Science publication in the USA.⁴
- 11) The US publication points out that there are significant concerns where the forensic laboratory is not independent of the regulatory agency or is not autonomous within the agency. Neither of these preconditions seems to apply to the DFO virus test laboratories. Under this situation, there is always a risk of bias, knowing or unknowing, in the collection and testing of samples or a clear discernment by the policy makers of the uncertainties in data. In my view, there is a clear and present danger that the strength of the conclusions of the DFO and CFIA regulators is not matched by the uncertainties in newly developing studies of salmon virus molecular genetics.
- 12) I would urge Justice Cohen to give some serious consideration to the idea that the testing of salmon virus data in the future be conducted by independent laboratories under the aegis of an independent scientific panel, drawn from Canada, USA and Europe. The cross border political friction and the stakeholder scepticism might well be reduced. As described by Krebs (footnote 1), there are many virtues to an open, transparent and accountable process.

³ (2008) **Report of the Inquiry into Pediatric Forensic Pathology in Ontario**, (Ontario Ministry of the Attorney General, Toronto, 2008) [Goudge Report].

⁴ (2009) **Strengthening Forensic Science in the United States: A Path Forward** ; Committee on Identifying the Needs of the Forensic Sciences Community, National Research Council ISBN 978-0-309-13135-3 352 pages 6 x 9 HARDBACK (2009)

I look forward to the pending Cohen Commission testimony so that bystanders like myself and the other stakeholders might have some idea in the testimony of characterisation of the limits of analyses, accuracy of analyses, reliability of identification and weighing and interpreting the results and testimony. I am not convinced by the recent blanket statements of the DFO and the CFIA that they have properly characterised the present limits of the scientific data with respect to salmon viruses.

If there is even a small probability that an asymptomatic virus is present in wild salmon, then a prudent recommendation would be for the removal or isolation of the fish farms from wild salmon migratory routes until the molecular genetics of fish viruses is established to the satisfaction of all the stakeholders. This can be justified on both economic and ecological grounds.

Yours sincerely

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