



November 2, 2016

In a further contribution to the Committee's study of "Genetically Modified Animals for Human Consumption", the Canadian Biotechnology Action Network respectfully provides the following information in response to four statements made by Dave Conley of the company AquaBounty, in testimony to the House of Commons Standing Committee on Agriculture and Agri-food, October 4, 2016.

Regarding the genetically modified (GM) Atlantic salmon called AquaAdvantage Salmon (AAS):

1. *"AquAdvantage salmon grow to maturity in approximately half the time that Atlantic salmon do"*

- Conventionally bred Atlantic salmon already grow faster than wild Atlantic salmon and two leading companies that breed and produce conventional non-GM salmon (SalmoBreed and Marine Harvest) have challenged AquaBounty's growth-rate claims, saying that current breeds of non-GM Atlantic salmon grow just as fast.¹ This challenge is given some weight by Henry Clifford, Vice President of Marketing & Sales at AquaBounty who, while stating that the company demonstrated fast growth rates, also said, "I have seen some of the marketing claims of growth rates in other [non-GM] commercial lines of Atlantic salmon, some of which are impressive, but until our GM salmon are tested side-by-side under identical rearing conditions and diets, it is speculative to claim that one line of salmon can outperform another."²
- The Fisheries and Oceans (DFO) risk assessment validated that AAS had increased growth and size at equivalent age relative to non-GM siblings but also stated that, "The accelerated growth phenotype of AAS appears to be very plastic, and is strongly influenced by environmental conditions."³

2. *"AquAdvantage salmon grow faster, but not larger."*

- The DFO's environmental risk assessment concluded that, "uncertainty remains around the maximum size of AAS."⁴ A DFO risk assessment in revision (obtained through court proceedings⁵) stated that "there is no evidence to support the claim that AAS does not grow larger than their non-transgenic counterparts"⁶ and noted that, "Should AAS reach a larger size than its wild conspecifics, they could potentially predate upon larger species not normally preyed upon by wild Atlantic salmon."⁷

3. *“We don’t have ISA.”*

- AquaBounty has experienced at least one outbreak of ISA (Infectious salmon anemia) at its PEI facility. The US Food and Drug Administration indicates that the ISA virus entered the facility in 2008.⁸ As late as 2011, the company stated that it did not know how the disease entered its operation.⁹
- The DFO environmental risk assessment stated, “it is highly certain that AAS is highly susceptible to ISAV [infectious salmon anemia virus]” though it concluded that fish disease risk at the AquaBounty facility in PEI is well managed.¹⁰

4. *“These are all female fish, so they can't mate with each other. They're sterile, so they can't mate and reproduce with wild Atlantic salmon.”*

- Further in testimony on October 4, in response to a question on the success rate of sterility (via triploidy), Mr. Conley clarified that AquaBounty, in data submitted to the US FDA, had achieved 99.8% sterility. Under FDA regulatory approval, AquaBounty is only required to achieve a 95% sterility rate.¹¹
- The precaution of producing all-female AquaAdvantage salmon does not address the full scope of environmental risk because of the possibility that GM salmon could breed with other species. For example, one peer-reviewed study showed that AquaBounty’s GM salmon can interbreed with wild brown trout.¹²

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¹ See Bioteknologinemnda - The Norwegian Biotechnology Advisory Board, Comments to the US Food and Drug Administration, April 24, 2013 http://www.bioteknologiradet.no/filarkiv/2013/06/Opinion_AquAdvantage_NBAB.pdf ; “Salmon egg producer questions AquaBounty's claims.” Intrafish. November 1, 2011; Food & Water Watch, Comments submitted to the Food and Drug Administration RE: Docket FDA-2011-N-0899-0685; Docket FDA-2011-N-0899-0003. April 26, 2013, page 23.

² Henry Clifford, Vice President of Marketing & Sales AquaBounty Technologies, Correspondence “Re: AquaAdvantage Salmon”, December 1, 2012 in United Nations Food and Agriculture Organization 2012 email conference on “GMOs in the pipeline: Looking to the next five years in the crop, forestry, livestock, aquaculture and agro-industry sectors in developing countries”, November 5 – December 2, 2012. http://www.fao.org/fileadmin/user_upload/biotech/docs/conf18msgs.pdf

³ Fisheries and Oceans Canada, Canadian Science Advisory Secretariat, Science Response 2013/023 “Summary of the Environmental and Indirect Human Health Risk Assessment of AquaAdvantage Salmon” http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2013/2013_023-eng.pdf

⁴ Fisheries and Oceans Canada, Canadian Science Advisory Secretariat, Science Response 2013/023 “Summary of the Environmental and Indirect Human Health Risk

Assessment of AquaAdvantage Salmon" http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2013/2013_023-eng.pdf

⁵ Documents obtained through the case Ecology Action Centre and Living Oceans Society – and – Minister of the Environment, Minister of Health and AquaBounty Canada Inc. Federal Court <http://www.ecojustice.ca/case/genetically-modified-salmon-litigation/>

⁶ Fisheries and Oceans Canada, Office of Aquatic Biotechnology. "Environmental and indirect human Health Risk assessment of the AquaAdvantage Salmon." Draft in Revision. July 2, 2013, page 81.

⁷ Ibid, page 324.

⁸ Food and Drug Administration Center for Veterinary Medicine. "Draft Environmental Assessment for AquaAdvantage® Salmon." May 4, 2012. Page 33.

⁹ Stotish, Ron. Response to questions by Mark Begich. U.S Senate Subcommittee on Oceans, Atmosphere, Fisheries, and Coast Guard Oversight Hearing on the Environmental Risks of Genetically Engineered Fish." December 15, 2011, page 73.

¹⁰ Fisheries and Oceans Canada, Canadian Science Advisory Secretariat, Science Response 2013/023 "Summary of the Environmental and Indirect Human Health Risk Assessment of AquaAdvantage Salmon" http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2013/2013_023-eng.pdf

¹¹ Food and Drug Administration Center for Veterinary Medicine, "AquaAdvantage® salmon: briefing packet." Veterinary Medicine Advisory Committee. September 20, 2010, page 126.

¹² Hybridization between genetically modified Atlantic salmon and wild brown trout reveals novel ecological interactions Krista B. Oke, Peter A. H. Westley, Darek T. R. Moreau, Ian A. Fleming Proc. R. Soc. B 2013 280 20131047; DOI: 10.1098/rspb.2013.1047. Published 29 May 2013.