



YUKON RIVER DRAINAGE FISHERIES ASSOCIATION

November 22, 2010

Division of Dockets Management (HFA-305)
5630 Fishers Lane, Rm 1061
Rockville, MD 20852

RE: Docket No. FDA-2010-N-0385 - Labeling of AquAdvantage Genetically Engineered Salmon

To Whom It May Concern:

Thank you for the opportunity to comment on the approval and labeling of the AquAdvantage genetically engineered salmon. YR DFA is an association of commercial and subsistence fishers on the Yukon River, Alaska's longest river. The region we represent is home to some of the world's most prolific salmon resources, and the world's furthest migrating salmon runs on the Yukon River. These salmon provide a primary source of food and are essential to the continued viability of the subsistence way of life in Western Alaska. For many residents the commercial salmon harvest also provides the only means of income for those who live in the remote villages of the Yukon River.

As amplified below, we strongly oppose the approval of the genetically engineered salmon (GE) and urge the FDA to reject GE salmon. Should the FDA decide to approve the AquAdvantage GE salmon despite overwhelming opposition, clear, mandatory labeling must be required for all product types under all circumstances.

- I. The AquAdvantage GE salmon should not be approved because of the risks to wild salmon and human health.
 - A. GE fish pose serious risks to wild fish populations;

The threats of a GE salmon to wild salmon populations are substantial, as the threats from salmon farms – including pollution, disease, food competition and genetic contamination – are compounded with the farming of a GE salmon which grows twice as fast. Millions of farmed salmon have escaped from open-water net pens, outcompeting wild populations for resources and straining

ecosystems.¹ We believe any approval of GE salmon would represent a serious threat to the survival of native wild salmon populations, many of which have already suffered severe declines.

Escape of GE farmed salmon into the wild carries the risk that genetic material from these fish will invade the wild gene pools of native Pacific salmon populations. Nature is rife with examples of such genetic introgression and such gene pool mixing is common among fish,² and members of family Salmonidae are no exception.³ Indeed, Rosenfeld et al. 2000 documented that the largest members of the Pacific salmon (Chinook salmon) are capable of successful reproduction in the wild with the smallest members of their genus (pink salmon). The fact that both species were introduced to the environment where the genetic introgression occurred (the Laurentian Great Lakes) and that pink salmon were introduced accidentally when eggs from an "isolated" hatchery were disposed of is particularly chilling in the context of concerns about the AquaBounty proposal to contain GE salmon eggs. Research on such genetic pollution resulting from what scientists call the "Trojan gene" effect published in the *Proceedings of the National Academy of Sciences* notes that a release of just sixty GE fish into a wild population of 60,000 would lead to the extinction of the wild population in less than 40 fish generations.

If the FDA approves the AquaAdvantage salmon, GE fish will likely be among the millions of salmon that currently escape from open ocean pens every year. This could be the final blow to wild salmon stocks, and in turn the thousands of men and women who depend on fishing for their livelihoods.

Even if grown in contained, land-based facilities, the "farming" of fish is already harming salmon fishermen. In addition to the threat of these GE salmon displacing native salmon populations, such fish farming encourages the propagation of deadly fish diseases, the concentration of harmful wastes and industrial drugs and chemicals escaping into open waters, and the over-fishing of vast quantities of non-commercial fish to feed carnivorous farmed fish, such as salmon. It generally takes three pounds of wild fish to grow one pound of farmed salmon.⁴ Since the AquaAdvantage salmon have

¹ A study published in *Conservation Biology* reported that non-native Atlantic salmon were found in over 80 wild salmon spawning streams in British Columbia, with feral juvenile Atlantic salmon having been discovered at three locations [Volpe, J.P., Taylor, E.B., Rimmer, D.W. & Glickman, B.W. (2000). Evidence of natural reproduction of aquaculture-escaped Atlantic salmon in a coastal British Columbia river. *Conservation Biology* 14: 899-903. (<http://www.agobservatory.org/library.cfm?refID=70186>). Additionally, most salmon farmers only report large-scale releases, so these are likely low estimates of escapes <http://www.llbc.leg.bc.ca/public/pubdocs/bcdocs/300626/v1chp5.htm>

² Hubbs, C. L. 1955. Hybridization between fish species in nature. *Systematic Zoology* 4:1–20; Rosenfeld, Todd and Greil (2000). Asymmetric Hybridization and Introgression between Pink Salmon and Chinook Salmon in the Laurentian Great Lakes. *Transactions of the American Fisheries Society* 129:670–679, 2000.

³ Foerster (1935), Dowling and Childs (1992) as reviewed in Rosenfeld, Todd and Greil (2000). Asymmetric Hybridization and Introgression between Pink Salmon and Chinook Salmon in the Laurentian Great Lakes. *Transactions of the American Fisheries Society* 129:670–679, 2000.

⁴ Naylor et al, Effect of Aquaculture on World Fish Supplies. *Nature*, Vol.405, June 29, 2000, pg.1017-1024 and Dr. Rebecca Goldberg, Murky Waters: Environmental Effects of Aquaculture in the United States. Environmental Defense Fund, October 1997.

been engineered for fast growth, it stands to reason that their feed requirements will be even higher. Wild Atlantic salmon are already on the Endangered Species List in the U.S.; approving these GE Atlantic salmon will undoubtedly add to the burden on wild stocks.

B. GE fish pose serious risks to human health;

There is substantial concern that the routine use of antibiotics to control diseases often found in farmed fish may impact human health. Transgenic fish may be susceptible to more diseases than fish currently grown in aquaculture facilities because transgenic fish are identified as "macro-mutants" with a reduced ability to survive. Consequently, the amount of antibiotics given to transgenic fish may be higher than the amount currently given to farmed fish; already farmed salmon are given more antibiotics than any other livestock by weight.

In addition, for both growth hormone and another insulin-like hormone, IGF-1, there are no data on levels in the flesh of triploid GE salmon, because only inappropriate and insensitive tests were used to try and detect it. Given this lack of data on two of the identified potential hazards of this GE fish, rather than state that there are no problems, FDA should say that this study is of insufficient quality and needs to be redone using more sensitive test methods. In addition, prior to this GE salmon being approved, the company should provide data on the levels of growth hormone and IGF-1 in the muscle of triploid GE salmon that have been raised in Panama, not at the PEI facility. This is particularly important for IGF-1, a hormone linked to a number of cancers. GE salmon also may be more allergenic than non-GE salmon.

II. If approved, clear, mandatory labeling for GE fish must be required for all product types under all circumstances.

A. Mandatory labeling must be required because there are key material differences between GE salmon and non-GE salmon.

GE salmon has several differences which qualify as "material" and therefore mandate required labeling. One of these differences is changes in the composition of salmon from the insert of the aquadvantage genetic construct. The vitamin and mineral content of GE salmon is also worse than in other farmed salmon. The AquAdvantage salmon may be more allergenic than other salmon and contains less healthy fatty acids than do other farmed salmon.

B. Mandatory labeling must be required to protect U.S. salmon markets;

If approved, clear, mandatory labeling for GE fish must be required for all product types under all circumstances to protect U.S. salmon markets. Many salmon caught and processed in the United

States are sold in foreign markets. If GE fish are not labeled, there will be confusion over which U.S. salmon products are GE and which are not. This could significantly impact markets for all salmon fishermen. Labeling would allow those nations and consumers who wish not to buy genetically engineered products a clear choice in the market place.

In closing, the AquAdvantage GE salmon should not be approved because of the risks to wild salmon and human health, and we urge the FDA to not approve this product. Should the FDA decide to approve the AquAdvantage GE salmon despite overwhelming opposition, clear, mandatory labeling must be required for all product types under all circumstances.

Thank you for the opportunity to comment on this important issue. If you have any further questions please do not hesitate to contact me at becca@yukonsalmon.org or (907)272-3141 x106.

Sincerely,

A handwritten signature in black ink, appearing to read 'R. Robbins', is centered within a light gray rectangular box.

Rebecca Robbins Gisclair
Policy Director