AquAdvantage® Salmon – A Pioneering Application of Transgenics in Aquaculture

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In 1989 a team of Canadian scientists introduced a Chinook salmon growth hormone gene into Atlantic salmon eggs, resulting in unprecedented growth-rate enhancement in Atlantic salmon. This pioneering application of transgenics in aquaculture led to the creation of what is now known as *AquAdvantage*® Salmon, a unique line of Atlantic salmon under development by the US company Aqua Bounty Technologies. After two decades of research, thousands of fish reared over eight generations, and submission of scientific and regulatory studies, this innovation is likely nearing its commercial debut. If approved by the U.S. FDA's Center for Veterinary Medicine, the *AquAdvantage*® Salmon, will be the first transgenic food animal approved in the USA, and will allow Aqua Bounty Technologies to commercialize eggs and license *AquAdvantage*® technology to commercial aquaculture operations on a worldwide basis. Commercialization of this technology can enhance aquaculture productivity far beyond classical genetics by delivering quantum gains in productivity to the farmer in a fraction of time required by traditional genetic improvement programs.

What is *AquAdvantage*® Salmon?

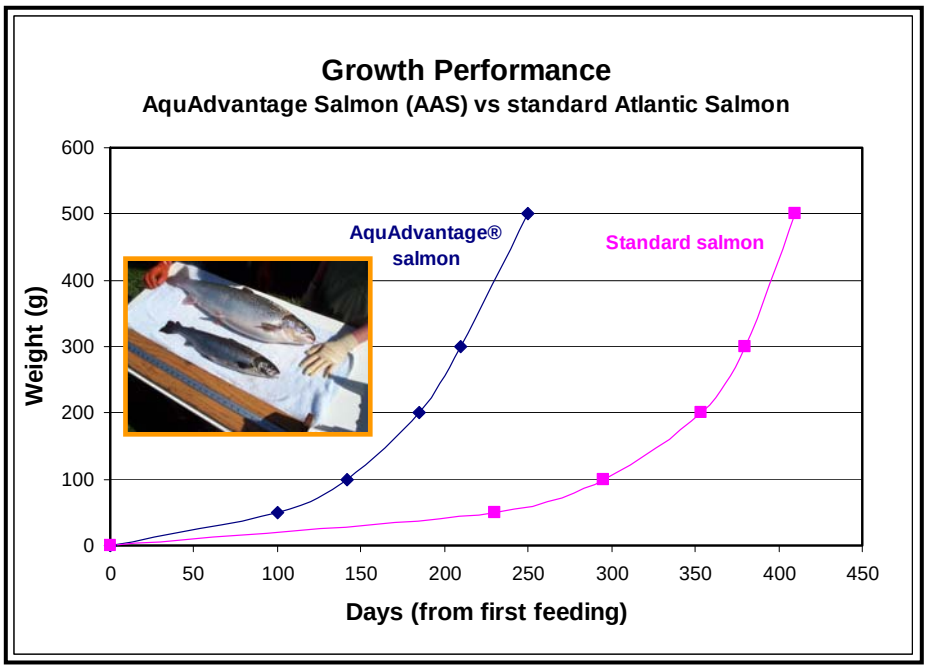
AquAdvantage® Salmon is a proprietary commercial line of rapidly growing transgenic Atlantic salmon (*Salmo salar*) developed to improve the economics of salmon aquaculture by reducing time to market and cost of production. The product of 20 years of innovation, *AquAdvantage*® Salmon contain a single copy of the (Chinook) salmon growth hormone gene. The "all-salmon" transgene in *AquAdvantage*® Salmon permits faster growth via constant, year round production of the Atlantic salmon's natural, intrinsic growth hormone, allowing the fish to maximize its growth potential under adequate food and temperature conditions. The transgene has been demonstrated to be stably inherited, unchanged in location or function over eight successive generations of *AquAdvantage*® Salmon.

Aqua Bounty has completed a large number of technical studies extensively characterizing *AquAdvantage*® Salmon. The genetic composition (genotype), growth characteristics (phenotype), animal safety, and human food safety have all been the subject of intense investigation. As part of the regulatory review process of the U.S. FDA, exhaustive scientific studies conducted by Aqua Bounty and third parties demonstrated no material differences between *AquAdvantage*® Salmon and conventional farmed Atlantic Salmon in terms of nutritional and hormonal profile. Results of the studies showed no increase in growth hormone levels in the flesh of *AquAdvantage*® Salmon when compared with other farm-raised salmon, and in fact levels were below the limit of detection,

effectively zero. Complete carcass analysis of *AquAdvantage*® Salmon established that they produce the same proteins found in other Atlantic salmon, and since their biochemical and nutritional composition is indistinguishable from commercial farmed salmon, *AquAdvantage*® Salmon are safe for human consumption.

Performance Characteristics of *AquAdvantage*® Salmon

AquAdvantage® Salmon grow approximately twice as fast as conventional Atlantic salmon, depending on water temperature and feed availability. The growth rates depicted in the figure to the right were generated at 9 -10°C, which is considered sub-optimal for salmon; growth rates under optimal commercial conditions may be superior.



Environmental Mitigation

In order to address environmental concerns about the potential risk of escape of transgenic salmon, Aqua Bounty has incorporated redundant, multi-level biological and physical containment measures into its commercial development plan for *AquAdvantage*® Salmon. All *AquAdvantage*® Salmon will be sterile (triploid) and single sex (female), so that in the event of escape into the environment, they will be unable to reproduce and establish breeding populations, or breed with native fish populations. Aqua Bounty will only sell *AquAdvantage*® Salmon to growers who raise them in secure confined systems. We expect that as growers and consumers gain experience with the safety and benefits of *AquAdvantage*® Salmon, other production systems may be granted regulatory approval. Aqua Bounty is committed to good product stewardship, and will work with environmental and regulatory authorities to assure that the benefits of *AquAdvantage*® Salmon are enjoyed by all, while ensuring that there is no risk to wild populations or the environment.