



Genetically Modified Salmon

The world's first genetically engineered (genetically modified or GM) food animal is a GM Atlantic salmon currently sold in Canada.

- » The GM salmon is only sold in Canada but will soon also be sold in the U.S.
- » GM salmon is only grown by the company AquaBounty which developed the technology.
- » Production is shifting to two new facilities: one in Canada (P.E.I.) and one in the U.S. (Indiana). Until now, the GM salmon was produced in Panama.
- » It is not labeled as GM for consumers in Canada.

THE GM SALMON

The Atlantic salmon is genetically engineered to grow faster using a growth hormone gene from Chinook salmon and genetic material from ocean pout. The company says it can grow nearly three times faster than other salmon in fish farms, to reach market-size in almost 18 months instead of three years.

The GM salmon was developed by a company called AquaBounty, based on research patented by two Canadian university professors. The GM salmon has the brand name "AquAdvantage".

THE GM SALMON IN CANADA

Health Canada approved the GM Atlantic salmon as safe to eat in 2016 and it was first sold in Canada in 2017.

AquaBounty sold 4.5 tonnes of GM salmon into Canada in 2017 and 4.5 tonnes in 2018. **It is not labelled as genetically modified** and no information about where it is being sold is publicly available. Government import

documents received through Access to Information by the Quebec group Vigilance OGM show that it was imported from Panama as frozen fillets and shipped into Montreal.

The company has started growing the first batches of GM salmon at its new on-land facility in P.E.I., as well as its' site in Indiana, U.S., **for sale in 2020**. Until now, the company was producing it in Panama.

Government approvals in Canada and the U.S. stipulate that it can only be produced on land, at specific sites. In Canada, only AquaBounty can produce the GM salmon, and only at its facility at Rollo Bay in P.E.I.

ENVIRONMENTAL ISSUES

If genetically modified salmon or salmon eggs escape from fish farms, they could put endangered wild salmon at risk. Research shows that that GM salmon could out-compete wild salmon for food (Devlin et al) or breed with wild salmon or other species such as wild brown trout (Oke et al, 2013). A 2013 Fisheries and Oceans Canada (DFO) risk assessment concluded that if the GM salmon escape, the hazard to wild Atlantic salmon populations is high.¹

Because fish can escape from fish farms in the ocean, AquaBounty is **only permitted to grow GM salmon on land**. While land-based containment is not risk-free, in 2013 Fisheries and Oceans Canada (DFO) concluded that the risk of escape from AquaBounty's facility is low to moderate. Additionally, if escape happens, the company says that most or all of the GM salmon (98.5% or more) will be sterile (via triploidy) females.

According to the 2019 risk assessment from DFO, however, AquaBounty now proposes to produce and sell non-GM salmon eggs as well as GM salmon eggs at its P.E.I. factory. DFO made a number of recommendations for production and shipping practices to prevent the accidental mixing of GM and non-GM eggs but **these are not requirements**.²

AquaBounty says its GM fish is “the world’s most sustainable salmon” because it will be produced on land, removing many of the negative ecological impacts of fish farming, and it will be produced closer to urban markets to have a smaller carbon footprint. The company says it will take 25% less feed to get the fast-growing GM salmon to market, requiring less wild fish to be converted into salmon feed.

MARKET REACTION

All of Canada’s major grocery chains have stated that they do not sell the genetically modified salmon at their seafood counters and have no plans to sell it (Costco, Farm Boy, Federated Co-operatives Ltd, Loblaw, Metro, Overwaitea Food Groups, Sobeys, and Walmart)³ Some restaurants including major sushi chains in Quebec have also declared they will not sell it.⁴

The Canadian Aquaculture Industry Association states that their members, who represent “virtually all farmed salmon in Canada” and are some of the biggest aquaculture companies in the world, “do not farm or sell GE farmed salmon, and are not growing or researching GE salmon”.⁵

AQUABOUNTY / INTREXON

AquaBounty is now a majority-owned subsidiary of the U.S. biotechnology company Intrexon which also owns the company Okanagan Specialty Fruits that developed the GM non-browning apple as well as the company Oxitec that is developing GM mosquitoes.

The Government of Canada has provided over \$8 million in grants and loans to support the development of the GM salmon. For example, in 2009, the Atlantic Canada Opportunities Agency gave AquaBounty \$2.87-million in an agreement that provides the government with a 10% royalty from product sales (from which product is unknown⁶ but AquaBounty states that it is not the GM salmon). The Government of P.E.I. has also provided grants and loans to the company, most recently a \$2.7-million grant to complete construction of the GM fish factory.

Timeline

2013: The Minister of the Environment and Climate Change Canada approved commercial production of GM salmon and salmon eggs, in land-based facilities.

2014 (October): The Government of Panama fined AquaBounty for violating environmental regulations.⁷

2016 (May): Health Canada approved the GM salmon for human consumption.

2016: The Federal Court of Canada ruled that the Minister’s 2013 decision only applies to AquaBounty’s Bay Fortune P.E.I. facility, triggering a new risk assessment for AquaBounty’s Rollo Bay facility.

2017 (June): The world’s first shipment of GM salmon (4.5 tonnes from Panama) arrived in Québec.

2017 (June): The Government of Prince Edward Island approved construction of AquaBounty’s Rollo Bay facility.

2018 (April): The world’s second world shipment (4.5 tonnes from Panama) arrived in Québec.

2019 (April): The Minister of Environment and Climate Change Canada approved production of GM salmon at AquaBounty’s facility at Rollo Bay, P.E.I.

REFERENCES

- 1 DFO. 2013. Summary of the Environmental and Indirect Human Health Risk Assessment of AquAdvantage® Salmon. Canadian Science Advisory Secretariat, Science Response 2013/023. 2013.
- 2 DFO. Environmental and Indirect Human Health Risk Assessments for the Manufacture and Grow-out of EO-1a Salmon, including the AquAdvantage® Salmon, at a Land-Based and Contained Facility near Rollo Bay, PEI., Canadian Science Advisory Secretariat, Science Advisory Report 2019/014. 2019.
- 3 See www.cban.ca/retailerstatements
- 4 See www.vigilanceogm.org/articles/entreprises-rejettent-le-saumon-ogm
- 5 See www.aquaculture.ca/caia-position-genetically-modified-salmon/
- 6 See correspondence posted at www.cban.ca/fish
- 7 See www.cban.ca/fish

For more information and details: www.cban.ca/fish



cban.ca

The Canadian Biotechnology Action Network (CBAN) brings together 16 organizations to research, monitor and raise awareness about issues relating to genetic engineering in food and farming. CBAN members include farmer associations, environmental and social justice organizations, and regional coalitions of grassroots groups. CBAN is a project on Tides Canada’s shared platform. www.cban.ca