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9B18M050

AQUADVANTAGE SALMON: COMMUNICATING TO BUILD CONSUMER CONFIDENCE[[1]](#endnote-1)

Julia Cutt wrote this case under the supervision of Professors Mary Weil and Mark Vandenbosch solely to provide material for class discussion. The authors do not intend to illustrate either effective or ineffective handling of a managerial situation. The authors may have disguised certain names and other identifying information to protect confidentiality.

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On Monday, May 16, 2016, Dave Conley, director of Corporate Communications for AquaBounty Technologies, Inc. (AquaBounty), learned that AquaBounty’s genetically modified salmon, AquAdvantage salmon (AAS), had been approved for sale by Health Canada. The approval would be made public at a press conference on Thursday, May 19. Conley needed to finalize an issues management plan that would prepare AquaBounty for possible negative reactions to the Health Canada approval of AAS. In late 2015, AquaBounty had received similar approval for AAS from the U.S. Food and Drug Administration (FDA). Public reaction to the FDA approval had been mixed, and Conley knew he needed to review how AquaBounty had handled the 2015 announcement before crafting his communication strategy for Canada. A well-crafted issues management plan, encompassing issues from government interaction to media relations, would position AquaBounty to successfully ensure that Canadian consumers adopted a positive opinion of AAS.

DAVID CONLEY

David Conley joined AquaBounty in 2013. He had graduated from McGill University with a master of science degree in parasitology, which had followed a bachelor of science degree in agriculture, with a major in renewable resources development.[[2]](#endnote-2) During his career, Conley had worked for the Commissioner for Aquaculture Development at Fisheries and Oceans Canada. In a statement, Conley said:

My career in aquaculture began 31 years ago in 1985, while I was a mature student. I was 31 when I went back to university at McGill. I followed the development of AquaBounty almost from its founding in 1991. When I first heard of their fast-growing salmon, I thought it was the most innovative advancement ever in the field of salmon aquaculture, and I still believe that today.[[3]](#endnote-3)

Conley had also been a volunteer director of Aquaculture without Frontiers, an organization devoted to promoting sustainable aquaculture in the developing world.[[4]](#endnote-4)

AQUADVANTAGE TECHNOLOGIES, INC.

AquaBounty was a biotechnology company focused on improving productivity in the commercial aquaculture industry.[[5]](#endnote-5) AquaBounty had 23 employees, with offices in Maynard, Massachusetts and Fortune, Prince Edward Island.[[6]](#endnote-6) The company’s guiding philosophy focused on a “belief that modern genetics, married with technological advances in aquaculture production, can spur a radically more responsible and sustainable way of farming Atlantic salmon.”[[7]](#endnote-7)

Inspiration for AquaBounty’s AAS dated back to 1989, when a research team at Memorial University of Newfoundland discovered that advanced molecular genetics could be used to increase the growth rate of Atlantic salmon, shortening the time to marketable size.[[8]](#endnote-8) AquaBounty was founded in 1991 under the name “A/F Protein” to pursue the commercial development of protein technology. In 1996, A/F Protein acquired a licence to the AAS technology and went through a reorganization. The newly formed entity, AquaBounty Farms, retained the AAS technology. In 2004, AquaBounty Farms was re-named AquaBounty Technologies, Inc.[[9]](#endnote-9)

AquaBounty was listed on the London Stock Exchange’s Alternative Investment Market in 2006, raising US$28 million[[10]](#endnote-10) from its initial public offering of stock.[[11]](#endnote-11) Biotechnology giant Intrexon Corporation (Intrexon) acquired a majority ownership of AquaBounty in 2013.[[12]](#endnote-12) Founded in 1998, Intrexon focused on creating biologically-based products in the health, food, energy, environment, and consumer industries.[[13]](#endnote-13) Intrexon stated:

At present rates of global industrialization and population growth, food and energy supplies and environmental and healthcare resources are becoming scarcer. We believe Intrexon’s leading Better DNA approach to synthetic biology has the potential to provide new, more effective and sustainable solutions to address these challenges.[[14]](#endnote-14)

GENETICALLY MODIFIED FOODS IN CANADA

Genetically modified foods were derived from organisms whose heritable traits had been altered.[[15]](#endnote-15) Techniques used to create genetically modified foods included crossbreeding, gene splicing, and chemical- or radiation-induced genetic manipulation.[[16]](#endnote-16) In 1994, the Flavr Savr tomato became the first genetically modified food approved by the FDA.[[17]](#endnote-17) Since then, approximately 85 genetically modified foods were approved for sale in Canada. In addition, Canada grew four main genetically modified crops: canola, soybeans, corn, and sugar beet.[[18]](#endnote-18) As much as 80 per cent of foods sold in the United States contained genetically modified ingredients.[[19]](#endnote-19) Genetically modified foods were developed for a variety of reasons. Some benefits included resistance to extreme weather conditions such as frost and drought, higher yields or faster growth to market size, and a higher concentration of nutrients.[[20]](#endnote-20)

Before any new agricultural or food product could be approved for production or sale in Canada, it needed to pass thorough safety assessments that were designed by Health Canada to protect humans, animals, and the environment. Health Canada categorized genetically modified foods as “novel” products, and they were subject to these assessments.[[21]](#endnote-21) On average, it took seven to 10 years to research, develop, and test a novel food. After this work was completed, a company could then submit an application for market access to the Government of Canada. Health Canada scientists who had expertise in molecular biology, toxicology, chemistry, nutritional sciences, and microbiology then reviewed the applications. Genetically modified foods were carefully assessed for their potential to produce new toxins or allergens.[[22]](#endnote-22)

Canada did not require genetically modified foods to be labelled as such.[[23]](#endnote-23) Voluntary labelling was permitted, and some companies, such as General Mills Inc., opted to label their products that contained genetically modified ingredients.[[24]](#endnote-24) Food labelled as “organic” in Canada could not contain genetically modified ingredients.[[25]](#endnote-25)

AQUADVANTAGE SALMON

In 1989, a research team at Memorial University of Newfoundland discovered that a novel application of molecular genetics could significantly increase the growth of Atlantic salmon. This research led to the development of AquaBounty’s AAS technology.[[26]](#endnote-26) AquaBounty created AAS by adding a growth hormone gene from the Chinook salmon to an Atlantic salmon. This genetically modified salmon experienced rapid growth during early life, and reached full market size in just 20 months, half the time of wild and farmed salmon.[[27]](#endnote-27) AAS was identical to traditional salmon in every other way, including taste, nutrition, and allergens.[[28]](#endnote-28)

AquAdvantage grew faster than traditional salmon and required 25 per cent less feed to grow to maturity. AquaBounty touted that its AAS was better, both for the environment and for consumers.[[29]](#endnote-29) Exhibit 1 highlights the environmental benefits of AAS, according to AquaBounty. The company intended to produce its genetically modified salmon in land-based production systems, in an effort to eliminate the risk of salmon escaping and negatively affecting native fish populations.[[30]](#endnote-30)

AquaBounty first began seeking approvals for the production and sale of AAS in 2003, when it submitted its first regulatory study to the FDA, seeking a New Animal Drug Application. In 2008, as part of this application process, the FDA inspected AquaBounty’s hatchery in Prince Edward Island, and reported no adverse findings. One year later, the FDA followed up with an inspection of AquaBounty’s land-based production facility in Panama, and the company submitted its final regulatory study. According to AquaBounty’s chronology of AAS, in 2010 the FDA deemed AAS safe to eat and safe for the environment, calling it “indistinguishable from Atlantic salmon.”[[31]](#endnote-31) In 2011, after consultation with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service, the FDA upheld its assessment that AAS posed no threat to the environment. At this time, the FDA released its findings and held an open public meeting, initiating a mandatory public comment period.[[32]](#endnote-32)

In 2012, AquaBounty submitted AAS for approval of sale in Canada.[[33]](#endnote-33) A year later, in 2013, AquaBounty received authorization from Environment Canada to produce eggs at its Prince Edward Island hatchery, after AAS was found not to pose a risk to the environment.[[34]](#endnote-34)

In November 2015, the FDA officially approved AAS as fit for consumption—making it the first genetically modified animal approved for sale in the United States. The approval was met with fierce opposition from a variety of consumer and environmental groups. Hours after the approval announcement, the U.S. Center for Food Safety said it would organize a lawsuit to challenge the FDA decision. Halifax-based Ecology Action Centre issued a court challenge against the FDA approval for sale and a challenge against Environment Canada’s approval for production.[[35]](#endnote-35) Shortly after the FDA approval was made public, Whole Foods, Trader Joe’s, and Costco issued statements that they would not sell genetically modified fish in their stores.[[36]](#endnote-36)

NEGATIVE REACTION

Following the public approval announcement from the FDA, environmentalists were quick to issue press releases criticizing the decision. Many critics were also working hard to link the label *frankenfish* to AquaBounty’s AAS. Wenonah Hauter, executive director of Food & Water Watch, said the FDA approval occurred “despite insufficient safety testing and widespread opposition. This unfortunate, historic decision disregards the vast majority of consumers, many independent scientists, numerous members of Congress and salmon growers around the world, who have voiced strong opposition.”[[37]](#endnote-37)

The Center for Food Safety said the FDA

ignored millions of Americans and more than 40 members of Congress who have expressed vocal opposition. FDA also neglects the concerns of more than 300 environmental, consumer, health and animal welfare organizations, salmon and fishing groups and associations, food companies, chefs and restaurants. Approximately 2 million people filed public comments with the FDA in opposition to this action, the largest number of comments the FDA has ever received on an action.[[38]](#endnote-38)

Andrew Kimbrell, executive director of the Center for Food Safety, said, “The review process by FDA was inadequate, failed to fully examine the likely impacts of the salmon’s introduction, and lacked a comprehensive analysis. This decision sets a dangerous precedent, lowering the standards of safety in this country.”[[39]](#endnote-39)

Several U.S. politicians spoke out against AAS. Lisa Murkowski, a Republican senator from Alaska, said the engineered salmon could hurt the wild salmon industry in Alaska and that she was angry about the approval. “I am livid at the FDA’s announcement to approve genetically engineered ‘salmon’—what seems to be more science experiment than fish or food,” she said in a statement. Murkowski said she would lobby for legislation to mandate labelling of the new salmon.[[40]](#endnote-40)

Joseph Bogaard, director of the Seattle-based Save Our Wild Salmon, was quoted in the *Los Angeles Times* as saying that genetically engineered salmon “could represent a new threat to wild populations very much like salmon farms do currently.”[[41]](#endnote-41)

Reaction on Twitter was mixed, with some decidedly negative tweets: Kevin Lee (@Grapey Wine) said, “This is gross and wrong.”[[42]](#endnote-42)

Igor Radovitskiy (@igoresque) said, “Lots of troubling details left out of #AquAdvantage story:1) it has genes from eel like fish called ocean pout (look it up, not pretty)” “2) The process relies on Arctic charr sperm and 3) young #AquAdvantage fish are shipped from Canada to Panama continue life cycle.”[[43]](#endnote-43)

Iron Giant (@JW\_Canada) said, “I will #boycott the #frankenfish from #AquAdvantage; I will not be a guinea pig for their hubris; Life is far too complex to be messed with.”[[44]](#endnote-44)

Obliterated\_Prince (@finestfancyman) said, “Eww I never want to eat #AquAdvantage salmon that’s troubling and creepy #genetically modified.”[[45]](#endnote-45)

NEUTRAL REACTION

Gregory Jaffe, the director of the Project on Biotechnology forthe Center for Science in the Public Interest said:

While today’s decision marks the first approval of a GE [genetically engineered] food animal, its impact on American consumers will be negligible. It will take months for AquaBounty to produce and export GE salmon for consumers to purchase. When they are at full capacity, the volume of imported GE salmon will be merely a “drop in the bucket” of salmon purchased on a yearly basis.[[46]](#endnote-46)

Robert Vanasse, executive director of Saving Seafood, an information resource and public outreach effort for the commercial fishing industry, was quoted in the *Boston Globe* as saying that ensuring the farmed fish eat a marine diet to provide the same nutritional value is more important than the fish being sold to consumers: “I personally think the outrage of genetic modifications is driven by people who don’t understand biology.”[[47]](#endnote-47)

There were also many neutral/factual reactions on Twitter:

Nikolai Adamski (@NikolaiAdamski) said, “Original #FDA application in 1995; #GM #salmon finally approved after 20 years.”[[48]](#endnote-48)

Jussi Riekki (@JussiRiekki) said, “In the US, FDA has approved fast-growing genetically engineered salmon #AquAdvantage.”[[49]](#endnote-49)

SUPPORTIVE REACTION

In addition to negative and neutral reactions, some media articles were in favour of the FDA’s decision to approve AAS. The *New York Daily News* published a brief editorial titled “A Fish Called Wonder.”[[50]](#endnote-50) The Biotechnology Industry Organization was cited in the *Los Angeles Times* as saying, “Animal biotechnology can improve livestock to require less feed, produce more protein and reduce environmental impact, while also providing for enhanced animal health and welfare.”[[51]](#endnote-51)

The decision also received support from some academics, including William Muir, a Purdue University professor of animal science, who stated, “The current practice of using wild caught salmon as a food source is not sustainable; our oceans are overfished. . . . This development provides a safe and sustainable alternative.”[[52]](#endnote-52)

Additionally, Bruce Whitelaw, professor of animal biotechnology of the Roslin Institute at the University of Edinburgh, said, “This announcement signals that such products can be produced safely in our environment and are considered likely to contribute to society’s needs.”[[53]](#endnote-53)

The *Boston Globe* also did some on-the-street interviews with consumers supportive of the FDA’s approval. Liz Hamilton, a Tufts University medical student from Boston, was quoted as saying, “We’ve been genetically modifying food forever. I see no difference—genetically, molecularly—it’s all the same.”[[54]](#endnote-54) Similarly, Barry Canton, also from Boston, said he was comfortable with the approval, explaining, “There’s nothing unnatural in there. No scary chemicals.”[[55]](#endnote-55)

Positive comments also surfaced on Twitter, including from Jake Bergren (@JakeBergren), who said, “S/O [shout out] to the government for approving the first GMO [genetically modified organism] fish for consumption #Aquadvantage #FDA”.[[56]](#endnote-56)

Seth Peck (@sethpeck\_net) encouraged the industry, saying, “Really looking forward to seeing lower sushi prices thanks to #AquAdvantage. DO DEEP SEA BASS NEXT, SCIENCE PEOPLE!”[[57]](#endnote-57)

Following the FDA approval announcement, AquaBounty sought to minimize negative reaction by highlighting that its salmon would take approximately two years to reach market size. Additionally, Chief Executive Officer Ronald Stotish was quoted in the *New York Times* as saying that the initial amount of AAS on the market would be a tiny portion of the “more than 200,000 tons of Atlantic salmon that the U.S. imports annually.”[[58]](#endnote-58) AquaBounty’s approved production facility in Panama could produce only approximately 100 tons annually.[[59]](#endnote-59)

After gaining the FDA approval, AquaBounty issued a press release, noting the positive environmental impact of AAS, saying it “increases productivity while reducing costs and the environmental impacts associated with current salmon farming operations.”[[60]](#endnote-60)

Stotish said, “AquAdvantage Salmon is a game-changer that brings healthy and nutritious food to consumers in an environmentally responsible manner without damaging the ocean and other marine habitats.”

However, the public furor may have prompted action by the FDA—two months after the U.S. approval, it “issued a ban on the import and sale of GM fish until clear labelling guidelines were established.”[[61]](#endnote-61)

CONCLUSION

Health Canada’s approval of AAS was an important achievement for AquaBounty. The company now had access to the entire North American market, making the large-scale production of AAS a viable business opportunity. Conley was thrilled that AquaBounty was finally in a position to earn a return on its investment in AAS, but much challenging work lay ahead. Some North American consumers were skeptical of genetically modified foods, and the public reaction to the FDA’s approval of AAS had been fairly negative. Conley needed to finalize an issues management plan ahead of the upcoming announcement of Health Canada’s approval. Investing time in a stakeholder engagement plan would pay off in both minimizing negative media coverage and ensuring that consumers adopted a positive opinion of AAS.

EXHIBIT 1: The Sustainability of AquAdvantage Salmon

Cows eat 8 kilogram[s] of feed to put on one kilogram of body weight.

Pigs eat 3 kilograms of feed to put on one kilogram of body weight.

Chickens eat 2 kilograms of feed to put on one kilogram of body weight.

Conventional farmed Atlantic salmon’s best FCR is 1.2:1; AquAdvantage Salmon eat one kilogram of feed to put on one kilogram of body weight.

Note: FCR = feed conversion ratio

Source: AquaBounty Technologies, Inc., “Sustainable,” 2017, accessed January 2, 2018, https://aquabounty.com/sustainable/.

The AquAdvantage salmon is an Atlantic salmon. It has one extra gene added to its almost 40,000 genes. That extra gene is from a chinook salmon, and it produces a growth hormone, the same growth hormone that Atlantic salmon produce. The expression of this gene is controlled by a promoter sequence that acts as an “on” switch. That enables the additional growth hormone gene in the AquAdvantage salmon to function year-round instead of only during the spring and summer, as is the case with other Atlantic salmon. This is a seasonal thing. They basically grow in the spring and summer and they stop growing in the fall and winter.

As a result, AquAdvantage salmon grow to maturity in approximately half the time that Atlantic salmon do. Simply put, AquAdvantage salmon grow faster, but not larger. Consequently, AquAdvantage salmon reach a market weight of four to five kilos [kilograms] in 16 to 20 months versus 30 to 36 months for Atlantic salmon in sea cages.

Source: openparliament.ca, “Mr. Dave Conley (Director, Corporate Communications, AquaBounty Technologies, Inc.) at the Agriculture and Agri-Food Committee,” October 4, 2016, accessed December 12, 2017, https://openparliament.ca/committees/agriculture/42-1/22/dave-conley-1/only/.

**ENDNOTES**

1. This case has been written on the basis of published sources only. Consequently, the interpretation and perspectives presented in this case are not necessarily those of AquaBounty Technologies, Inc. or any of its employees. [↑](#endnote-ref-1)
2. openparliament.ca, “Mr. Dave Conley (Director, Corporate Communications, AquaBounty Technologies, Inc.) at the Agriculture and Agri-Food Committee,” October 4, 2016, accessed December 12, 2017, <https://openparliament.ca/committees/agriculture/42-1/22/dave-conley-1/only/>. [↑](#endnote-ref-2)
3. Ibid. [↑](#endnote-ref-3)
4. AquaBounty Technologies, Inc., “Our Media Contact—David Conley,” accessed December 13, 2017, https://aquabounty.com/media/. [↑](#endnote-ref-4)
5. AquaBounty Technologies, Inc., “Investor FAQ,” 2017, accessed February 28, 2017, <http://phx.corporate-ir.net/phoenix.zhtml?c=197553&p=irol-faq>. [↑](#endnote-ref-5)
6. AquaBounty Technologies, Inc., “About,” 2017, accessed February 28, 2017, https://aquabounty.com/about/. [↑](#endnote-ref-6)
7. Ibid. [↑](#endnote-ref-7)
8. Ibid. [↑](#endnote-ref-8)
9. AquaBounty Technologies, Inc., “Investor FAQ,” op. cit. [↑](#endnote-ref-9)
10. All currency amounts are shown in U.S. dollars unless otherwise noted. [↑](#endnote-ref-10)
11. AquaBounty Technologies, Inc., “Investor FAQ,” op. cit. [↑](#endnote-ref-11)
12. Intrexon, “Subsidiaries: AquaBounty—Improving Aquaculture Productivity and Sustainability,” 2017, accessed January 2, 2018, <https://www.dna.com/Company/Subsidiaries/AquaBounty>. [↑](#endnote-ref-12)
13. Intrexon, “Corporate Profile,” accessed January 2, 2018, <http://investors.dna.com/overview>. [↑](#endnote-ref-13)
14. Ibid. [↑](#endnote-ref-14)
15. Health Canada, “Frequently Asked Questions: AquAdvantage Salmon,” May 19, 2016, accessed January 2, 2018, www.hc-sc.gc.ca/fn-an/gmf-agm/appro/aquadvantage-salmon-saumon-faq-eng.php. [↑](#endnote-ref-15)
16. Ibid. [↑](#endnote-ref-16)
17. David Suzuki Foundation, “What You Can Do—Understanding GMO,” 2014, accessed March 5, 2017, www.davidsuzuki.org/what-you-can-do/queen-of-green/faqs/food/understanding-gmo/. [↑](#endnote-ref-17)
18. EatRightOntario, “Understanding Genetically Modified Foods,” October 18, 2017, accessed January 2, 2018, https://www.eatrightontario.ca/en/Articles/Food-technology/Biotechnology/Novel-foods/Understanding-Genetically-Modified-Foods.aspx. [↑](#endnote-ref-18)
19. Lois Abraham, “Canada Won’t Be Following the U.S. in Labelling GMO Food Products,” *Toronto Star*, March 30, 2016, accessed January 2, 2018, <https://www.thestar.com/business/2016/03/30/canada-wont-be-following-us-in-labelling-gmo-food-products.html>. [↑](#endnote-ref-19)
20. Ibid. [↑](#endnote-ref-20)
21. Health Canada, op. cit. [↑](#endnote-ref-21)
22. Ibid. [↑](#endnote-ref-22)
23. Ibid. [↑](#endnote-ref-23)
24. David Suzuki Foundation, op. cit. [↑](#endnote-ref-24)
25. Abraham, op. cit. [↑](#endnote-ref-25)
26. AquaBounty Technologies, Inc., “Innovation,” 2017, accessed January 2, 2018, <https://aquabounty.com/innovation/>. [↑](#endnote-ref-26)
27. Ann Hui, “Genetically Modified Salmon Approved for Consumption in Canada,” *The Globe and Mail*, updated March 24, 2017, accessed January 2, 2018, [www.theglobeandmail.com/news/national/health-canada-approves-genetically-modified-salmon-as-safe-for-consumption/article30094235/](http://www.theglobeandmail.com/news/national/health-canada-approves-genetically-modified-salmon-as-safe-for-consumption/article30094235/). [↑](#endnote-ref-27)
28. Health Canada, “Food and Nutrition—AquAdvantage Salmon,” May 19, 2016, accessed January 2, 2018, www.hc-sc.gc.ca/fn-an/gmf-agm/appro/aquadvantage-salmon-saumon-eng.php. [↑](#endnote-ref-28)
29. AquaBounty Technologies, Inc., “Sustainable,” 2017, accessed January 2, 2018, https://aquabounty.com/sustainable/. [↑](#endnote-ref-29)
30. Ibid. [↑](#endnote-ref-30)
31. AquaBounty Technologies, Inc., “Chronology of AquAdvantage Salmon and AquaBounty Technologies,” 2014, accessed January 2, 2018, <https://www.aquabounty.com/wp-content/uploads/2014/01/Chronology-of-AquAdvantage-Salmon-F1.pdf>. [↑](#endnote-ref-31)
32. Ibid. [↑](#endnote-ref-32)
33. Health Canada, “Food and Nutrition—AquAdvantage Salmon,” op. cit. [↑](#endnote-ref-33)
34. AquaBounty Technologies, Inc., “Chronology of AquAdvantage Salmon and AquaBounty Technologies,” op. cit. [↑](#endnote-ref-34)
35. Laura Chapin, “Genetically Modified Salmon Approved for Sale as Food in Canada,” CBC News, May 19, 2016, accessed January 2, 2018, www.cbc.ca/news/canada/prince-edward-island/pei-aquabounty-salmon-genetically-modified-food-1.3589613. [↑](#endnote-ref-35)
36. *Seattle Times*, “Costco Won’t Sell Engineered Salmon,” November 20, 2015, accessed January 22, 2018, https://www.seattletimes.com/business/retail/costco-says-it-wont-sell-genetically-modified-salmon/. [↑](#endnote-ref-36)
37. Food & Water Watch, “FDA Approves Unlabeled GMO Salmon Despite Widespread Opposition from Scientists, Consumers and Members of Congress,” November 19, 2015, press release, accessed January 2, 2018, https://www.foodandwaterwatch.org/news/fda-approves-unlabeled-gmo-salmon-despite-widespread-opposition-scientists-consumers-and. [↑](#endnote-ref-37)
38. Center for Food Safety, “FDA Approves First Genetically Engineered Animal for Human Consumption over the Objections of Millions,” press release, November 19, 2015, accessed January 2, 2018, www.centerforfoodsafety.org/press-releases/4131/fda-approves-first-genetically-engineered-animal-for-human-consumption-over-the-objections-of-millions. [↑](#endnote-ref-38)
39. Ibid. [↑](#endnote-ref-39)
40. Congressional Documents and Publications, “Alaska Delegation Responds to FDA Approval of GE Salmon; Marks First Ever Approval of GE Animal for Human Consumption,” Sen. Lisa Murkowski (R-AK) news release, November 19, 2015, accessed January 22, 2017, https://www.murkowski.senate.gov/press/release/alaska-delegation-responds-to-fda-approval-of-ge-salmon. [↑](#endnote-ref-40)
41. William Yardley, “Genetically Engineered Salmon Is Fit for Dinner, FDA Says in First Decision of Its Kind,” *Los Angeles Times*, November 19, 2015, accessed January 2, 2018, www.latimes.com/nation/la-na-sej-gmo-salmon-20151120-story.html. [↑](#endnote-ref-41)
42. Kevin Lee (@Grapey Wine), Twitter, November 20, 2015, accessed February 8, 2018, https://twitter.com/GrapeyWine/status/667800519553912832. [↑](#endnote-ref-42)
43. Igor Radovitskiy (@igoresque), Twitter, November 19, 2015, accessed February 8, 2018, https://twitter.com/igoresque/status/667456280160829440; Igor Radovitskiy (@igoresque), November 19, 2015, accessed February 8, 2018, https://twitter.com/igoresque/status/667456908622721024. [↑](#endnote-ref-43)
44. Iron Giant (@JW\_Canada), Twitter, November 20, 2015, accessed February 8, 2018, https://twitter.com/JW\_Canada/status/667806207906680832. [↑](#endnote-ref-44)
45. Obliterated\_Prince (@finestfancyman), Twitter November 19, 2015, accessed February 8, 2018, https://twitter.com/finestfancyman/status/667369276932780032. [↑](#endnote-ref-45)
46. Gregory Jaffe, “FDA Approves Fast-Growing Genetically Engineered Salmon,” Center for Science in the Public Interest, November 19, 2015, accessed January 2, 2018, <https://cspinet.org/new/201511191.html>. [↑](#endnote-ref-46)
47. David Abel, “FDA Ok’s Genetically Modified Salmon,” *Boston Globe*, November 20, 2015, accessed January 22, 2018, https://www.bostonglobe.com/metro/2015/11/19/fda-approves-sale-genetically-modified-salmon/eKejwGYs3DcJA40VszQyaJ/story.html. [↑](#endnote-ref-47)
48. Nikolai Adamski (@NikolaiAdamski), Twitter, November 19, 2015, accessed February 8, 2018, https://twitter.com/NikolaiAdamski/status/667610299399282688. [↑](#endnote-ref-48)
49. Jussi Riekki (@JussiRiekki), Twitter, November 20, 2015, accessed February 8, 2018, https://twitter.com/JussiRiekki/status/667675394104025088. [↑](#endnote-ref-49)
50. “A Fish Called Wonder,” *New York Daily News*, editorial, November 22, 2015, accessed February 23, 2018, www.nydailynews.com/opinion/editorial-fish-called-article-1.2442293. [↑](#endnote-ref-50)
51. William Yardley, “Genetically Engineered Salmon Is Fit for Dinner, FDA Says in First Decision of Its Kind,” *Los Angeles Times*, November 19, 2015, accessed January 22, 2018, http://beta.latimes.com/nation/la-na-sej-gmo-salmon-20151120-story.html. [↑](#endnote-ref-51)
52. Andrew Pollack, “Genetic Engineers Land Bigger Fish for U.S. Plates,” *International New York Times*, November 21, 2015. [↑](#endnote-ref-52)
53. Steve Connor, “Genetically Modified Salmon Becomes First to Be Approved for Human Consumption—But It Won’t Have to Be Labelled as GM,” *Independent*, November 19, 2015, accessed January 22, 2018, www.independent.co.uk/news/science/genetically-modified-salmon-becomes-first-to-be-approved-for-human-consumption-but-it-wont-have-to-a6741031.html. [↑](#endnote-ref-53)
54. Abel, op. cit. [↑](#endnote-ref-54)
55. Ibid. [↑](#endnote-ref-55)
56. Jake Bergren (@JakeBergren), Twitter, December 18, 2015, accessed February 8, 2018, https://twitter.com/JakeBergren. [↑](#endnote-ref-56)
57. Seth Peck (@sethpeck\_net), Twitter, November 23, 2015, accessed February 8, 2018, https://twitter.com/sethpeck\_net/status/668915360150630400. [↑](#endnote-ref-57)
58. Pollack, op. cit. [↑](#endnote-ref-58)
59. Ibid. [↑](#endnote-ref-59)
60. AquaBounty Technologies, Inc., “FDA Approves AquAdvantage® Salmon,” press release, PR Newswire, November 19, 2015, accessed January 2, 2018, https://www.prnewswire.com/news-releases/fda-approves-aquadvantage-salmon-300181839.html. [↑](#endnote-ref-60)
61. Ashifa Kassam, “GM Salmon Hits Shelves in Canada—But People May Not Know They’re Buying It,” *Guardian*, August 9, 2017, accessed January 2, 2018, https://www.theguardian.com/world/2017/aug/09/genetically-modified-salmon-sales-canada-aqua-bounty. [↑](#endnote-ref-61)