Negative Brief: Genetically Modified Salmon

By John Hall

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NEGATIVE PHILOSOPHY / OPENING QUOTES

Senator Lisa Murkowski: It’s a science experiment, not a food

Senator Lisa Murkowski 2015 (US Senator from Alaska) “Alaska Delegation Responds to FDA Approval of GE Salmon” <https://www.murkowski.senate.gov/press/release/alaska-delegation-responds-to-fda-approval-of-ge-salmon>

“I am livid at the FDA’s announcement to approve genetically engineered ‘salmon’—what seems to be more science experiment than fish or food,” said Senator Lisa Murkowski. “I have adamantly opposed the approval of GE salmon, both for the health of Americans and the sustainability of our fisheries, but now that the decision has been made, the next step must be to ensure that Americans know what they are consuming. I have introduced both a bill and provision in the appropriations process to mandate the labeling of Frankenfish, and it is more imperative than ever, after this potentially disastrous decision, to make sure they become law.”

Senator Dan Sullivan: No business on our dinner plates

Senator Dan Sullivan 2015 (US Senator from Alaska)“Alaska Delegation Responds to FDA Approval of GE Salmon” <https://www.murkowski.senate.gov/press/release/alaska-delegation-responds-to-fda-approval-of-ge-salmon>

“I am extremely disappointed in today’s decision by the FDA,” said Senator Dan Sullivan. “Genetically Engineered (GE) salmon has no business on our dinner plates. I remain committed to ensuring that at minimum, these newly approved Frankenfish are properly labeled so that Americans know exactly where their salmon came from. Wild Alaskan salmon is an abundant, sustainably managed resource, and despite this misguided decision, will continue to be one of the healthiest and tastiest foods in the world.”

INHERENCY

1. GMO Salmon are approved, remaining barriers not significant

Approved for sale November 2015

Lydia Wheeler, 2015 (Reporter for The Hill) “Advocates win labels for GMO 'frankenfish'” <http://thehill.com/regulation/pending-regs/263417-spending-bill-directs-fda-to-finalize-guidelines-for-labeling-gmo>

Lawmakers are responding to the agency's decision last month to approve a specific brand of salmon that’s genetically engineered to grow to market size faster than its farm-raised counterpart. FDA said AquAdvantage salmon, a product of AquaBounty Technologies, meets the statutory requirements for safety and effectiveness under the Federal Food, Drug and Cosmetic Act and is as nutritious as non-GMO Atlantic salmon, with no biologically relevant differences in the nutritional profile compared to that of other farm-raised Atlantic salmon. The GMO salmon will be raised in land-based, contained hatchery tanks in two specific facilities in Canada and Panama.

GMO Salmon have been approved, the only thing keeping the fish from being sold is the labeling guidelines

Lydia Wheeler, 2015 (Reporter for The Hill) “Advocates win labels for GMO 'frankenfish'” <http://thehill.com/regulation/pending-regs/263417-spending-bill-directs-fda-to-finalize-guidelines-for-labeling-gmo>

The 2009 page federal spending bill unveiled early Wednesday morning contains laguage forcing the Food and Drug Administration (FDA) to finalize guidelines for the labeling of genetically modified salmon — a victory for advocates seeking mandatory labels on all foods made with GMO products.

Labeling process is underway and funded

Lydia Wheeler, 2015 (Reporter for The Hill) “Advocates win labels for GMO 'frankenfish'” <http://thehill.com/regulation/pending-regs/263417-spending-bill-directs-fda-to-finalize-guidelines-for-labeling-gmo>

The $1.1. trillion bill to fund the government through September 2016 contains language that prohibits the agency from introducing any food that contains genetically engineered salmon until it publishes its final labeling guidelines. The spending bill also directs the FDA to use $150,000 of its funding to develop these guidelines and implement a program to disclose to consumers whether salmon offered for sale to consumers is of a genetically engineered variety.

2. Largest retailers won’t sell GMO salmon

Big retailers won’t sell modified salmon – too controversial

WASHINGTON POST 2015 (journalist Brady Dennis) 17 Dec 2015 “FDA must develop plan to label genetically engineered salmon, Congress says” <https://www.washingtonpost.com/news/to-your-health/wp/2015/12/17/congress-to-fda-no-genetically-engineered-salmon-in-supermarkets-unless-it-is-labeled/>

Knowing FDA likely would approve the AquaBounty salmon, consumer and environmental activists have in recent years convinced some of the country's largest retailers not to stock it. Chains such as Whole Foods, Trader Joe's, Costco and Target have said they will not sell the controversial fish.

HARMS / SIGNIFICANCE

1. Tiny impact

GMO salmon will be only a “blip” on the fish market

Karin Klein 2014 (journalist) LOS ANGELES TIMES 3 Mar 2014 “U.S. stores say no to genetically engineered salmon. Someone has to.” <http://www.latimes.com/opinion/opinion-la/la-ol-gmo-salmon-20140303-story.html>

Another consideration, which the FDA doesn’t talk about, is the opening of a door. This one operation might sound good to the agency (though it sounds like a potential environmental problem to me), but it would be a [very small](http://www.nature.com/news/transgenic-salmon-nears-approval-1.12903) operation. The fish from this one farm would be a blip on the fish-market scene. However, once the U.S. market has been opened to these fish, the business would grow, the proposals would go on and it’s practically a given that not all of the subsequent operations would be carefully designed and run.

Modified salmon market share will be restricted: Production facilities are limited

Dawn Brighid 2015 (project director of the food program's Eat Well Guide; BS in business marketing from San Jose State University, a certificate in health counseling from the Institute of Integrative Nutrition, and is working toward her MS in nutrition at Maryland University of Integrative Health) 24 Nov 2015

The good news though, is that AquAdvantage salmon will take about two years to hit the market. (Turns out that even GE salmon engineered to grow faster than wild salmon still take this long to get to market size.) In addition, the FDA only approved two facilities for the AquAdvantage salmon: one in Canada to produce eggs, and one in Panama where the fish will be raised. This limits the amount that can be produced, restricting GE salmon’s market share.

SOLVENCY

1. More study needed

FDA approval study process is flawed, and there’s no need to rush

Food and Water Watch, 2011 (Food & Water Watch is a Washington, D.C.-based non-governmental organization and consumer rights group which focuses on corporate and government accountability relating to food, water, and fishing. Food and Water Watch employs a four pronged effort focusing on public and policymaker education, lobbying, media, and Internet activism.) “Below the Surface: The Dangers of Genetically Engineered Salmon” <https://www.foodandwaterwatch.org/sites/default/files/below_the_surface_ge_salmon_fs_june_2011.pdf>

The FDA is considering approval of GE salmon through a process designed for new animal drugs, rather than developing an appropriate evaluation method for GE animals intended for human consumption. The FDA hasn’t fulfilled requirements to consult with other federal agencies that have serious concerns about approving GE salmon, and the U.S. Congress and state legislatures of Alaska and California have bills opposing GE salmon. The approval of GE salmon is likely to serve as a precedent for other GE animals entering the food supply. There are better alternatives available to meet the growing demand for fish, including sustainable, land-based recirculating aquaculture systems and effective management of wild fish populations. There is no need to endanger consumers and the environment by rushing to approve a poorly understood and potentially dangerous new GE salmon.

FDA approval process flawed: Studied it as an animal drug rather than a human food

The Huffington Post, Ocean Robbins, 2013 (Is founder and co-host (with best-selling author John Robbins) of the 90,000 member Food Revolution Network, an initiative to help you heal your body, and your world... with food.) “Is Genetically Engineered Salmon Safe?” <http://www.huffingtonpost.com/ocean-robbins/is-genetically-engineered_b_2522547.html>

The FDA chose to review AquAdvantage as an animal drug, rather than a human food. In the FDA’s view, the refashioned DNA that is in every cell of the fish’s body is considered a drug, and that’s what the agency is regulating. If approved, the AquAdvantage salmon would not only be the first GE animal approved for human consumption, but also the first animal drug that’s theoretically capable of swimming off into the ocean and reproducing.

DISADVANTAGES

1. Harming wild salmon

GMO salmon will find a way to reproduce

Prof. Joseph Palermo 2016 (Professor of History, California State Univ-Sacramento; Master's degree and Doctorate in History from Cornell University; Master's degree in History from San Jose State Univ.) 4 Jan 2016 “Frankenfish Wins FDA Approval” <http://www.huffingtonpost.com/joseph-a-palermo/frankenfish-wins-fda-appr_b_8911892.html>

The good scientists at AquaBounty assure us that their Frankensalmon are perfectly safe because they’re all females and sterilized. But even if we can be certain that 100 percent of the new species of pituitary-enhanced fish are sterile it still doesn’t mean that nature won’t find ways to reproduce anyway (after all, our friends at AquaBounty have millions of years of evolution to control).

Safeguards will be bypassed and escapes are inevitable

The Huffington Post, Ocean Robbins, 2013 (Is founder and co-host (with best-selling author John Robbins) of the 90,000 member Food Revolution Network, an initiative to help you heal your body, and your world... with food.) “Is Genetically Engineered Salmon Safe?” <http://www.huffingtonpost.com/ocean-robbins/is-genetically-engineered_b_2522547.html>

AquaBounty insists that their fish will be raised in controlled pens and will never be released into the ocean, and that besides, their fish will be sterile. But every year, millions of farmed fish escape from fish farms into the wild. It’s true that initial introduction of AquaBounty’s fish is slated for Panama in highly controlled pens. But AquaBounty is planning to market the eggs, not the fish. Once the production of GE fish becomes commercialized, it will be impossible to control the whereabouts of every single individual and assure compliance with appropriate containment measures. Some degree of release may be inevitable.

Safeguards are unenforceable

Food and Water Watch, 2011 (Food & Water Watch is a Washington, D.C.-based non-governmental organization and consumer rights group which focuses on corporate and government accountability relating to food, water, and fishing. Food and Water Watch employs a four pronged effort focusing on public and policymaker education, lobbying, media, and Internet activism.) “Below the Surface: The Dangers of Genetically Engineered Salmon” <https://www.foodandwaterwatch.org/sites/default/files/below_the_surface_ge_salmon_fs_june_2011.pdf>

AquaBounty plans to raise only sterile fish, but the FDA has called this claim “potentially misleading,” as up to 5 percent of these fish may be fertile. The company also claims their GE salmon will be raised in closed facilities so that wild stocks won’t be at risk. Since the company intends only to produce and sell the eggs, it is unclear how they could enforce such restrictions on aquaculture companies, like those in China, Southeast Asia and Chile, where regulations and oversight on aquaculture are notoriously weak.

Escapes happen

Prof. Joseph Palermo 2016 (Professor of History, California State Univ-Sacramento; Master's degree and Doctorate in History from Cornell University; Master's degree in History from San Jose State Univ.) 4 Jan 2016 “Frankenfish Wins FDA Approval” <http://www.huffingtonpost.com/joseph-a-palermo/frankenfish-wins-fda-appr_b_8911892.html>

Since these Frankensalmon are raised near fresh water sources such as rivers and streams to efficiently sweep out the waste products there is always the possibility of genetic pollution happening when some of these human-made animals escape into the wild, which already happens occasionally at normal salmon farms.

GMO salmon are NOT all sterile as the company claims

The Huffington Post, Ocean Robbins, 2013 (Is founder and co-host (with best-selling author John Robbins) of the 90,000 member Food Revolution Network, an initiative to help you heal your body, and your world... with food.) “Is Genetically Engineered Salmon Safe?” <http://www.huffingtonpost.com/ocean-robbins/is-genetically-engineered_b_2522547.html>

As to sterile fish, at present, there is no guaranteed method to produce 100% sterility. In fact, the FDA’s most recent study found that five percent of the animals were in fact fertile. If large numbers of fish escape, it doesn’t take a rocket scientist to deduce that some fertile fish might not only survive in the wild, but thrive.

GMO salmon will at least use food and resources needed by natural salmon

Prof. Joseph Palermo 2016 (Professor of History, California State Univ-Sacramento; Master's degree and Doctorate in History from Cornell University; Master's degree in History from San Jose State Univ.) 4 Jan 2016 “Frankenfish Wins FDA Approval” <http://www.huffingtonpost.com/joseph-a-palermo/frankenfish-wins-fda-appr_b_8911892.html>

And even if they can’t breed with wild salmon, they sure can gobble up a lot of resources that wild salmon need to survive. Also, the male wild salmon will likely try to breed with these females anyway because they didn’t get the memo from AquaBounty that they’re sterile, therefore exhausting themselves in fruitless efforts to reproduce that a far superior set of genes compel them to do - the kind of genes that took millions of years to evolve and have nothing to do with the profits of a corporation and its cheerleaders on Wall Street.

Approval of GMO salmon puts wild fisheries at risk: genetic contamination, interbreeding and direct competition

Congressman Don Young 2015 (Representative from Alaska) “Alaska Delegation Responds to FDA Approval of GE Salmon” <https://www.murkowski.senate.gov/press/release/alaska-delegation-responds-to-fda-approval-of-ge-salmon>

“This harebrained decision goes to show that our federal agencies are incapable of using commonsense,” said Congressman Don Young. “From the beginning, I’ve said the FDA’s process fails to consider the threats GE fish pose to natural salmon fisheries, including genetic contamination, interbreeding, and direct competition. By embarking on this science experiment, the FDA ignores fundamental risk questions related to our wild fish species and food safety. I will continue to push back against this decision that puts all our wild fisheries at risk. At the bare minimum, we must ensure that GE salmon are labeled so consumers know exactly what they are purchasing and feeding to their families.”

Nature throws surprises at systems we think are safe

Karin Klein 2014 (journalist) LOS ANGELES TIMES 3 Mar 2014 “U.S. stores say no to genetically engineered salmon. Someone has to.” <http://www.latimes.com/opinion/opinion-la/la-ol-gmo-salmon-20140303-story.html>

The fear is that the genetically modified salmon could breed with wild salmon and out-compete them for resources. Supporters of the product say that is incredibly unlikely to happen, but the past has taught us -- as with the possibility of earthquakes and tidal waves big enough to compromise the [Fukushima nuclear plant](http://www.latimes.com/topic/disasters-accidents/nuclear-disasters/japan-nuclear-emergency-%282011%29-EVAAD00002-topic.html) -- that nature has ways of throwing surprises at us, especially in an arena as untested as this one.

Impact: Alaskan coastal communities harmed

Alaska Marine Conservation Council 2014. (non-profit group advocating preservation of Alaskan coastal ecosystem) ethical note about the date: the article is undated but references material published in 2014) “GENETICALLY ENGINEERED SALMON” <http://www.akmarine.org/fisheries-conservation/protect-alaska-salmon/genetically-engineered-salmon/>

There is increasing pressure from the aquaculture industry to develop genetically engineered (GE) salmon for human consumption. Salmon farms can threaten the health and survival of wild fish populations through escapes, polluted effluent, and the spread of diseases. These problems have been documented on the east and west coasts where Atlantic salmon are farmed. Farmed salmon also compete with wild salmon in the marketplace and can have negative economic impacts on Alaska’s wild salmon industry and the fishermen and communities who depend on them. The potential for GE salmon to escape poses serious risks to wild fish populations, including:  
Genetic contamination of native gene pools  
Exposure to disease and parasites  
Competition for food  
Disruption of spawning grounds  
AMCC strongly opposes genetically engineered salmon because of the ecological risks to healthy, wild fish populations and the social and economic impacts to coastal communities that rely on maintaining a strong market for Alaska’s wild salmon.

Impact: Salmon extinction

The Huffington Post, Ocean Robbins, 2013 (Is founder and co-host (with best-selling author John Robbins) of the 90,000 member Food Revolution Network, an initiative to help you heal your body, and your world... with food.) “Is Genetically Engineered Salmon Safe?” <http://www.huffingtonpost.com/ocean-robbins/is-genetically-engineered_b_2522547.html>

AquaBounty, the company behind the first Frankenfish, insists that their creation poses no threat to wild salmon populations. But research published in the Proceedings of the National Academy of Sciences found that a release of just sixty GE salmon into a wild population of 60,000 would lead to the extinction of the wild population in less than 40 fish generations.

Impact: Devastating ecosystem and economic impacts

The Huffington Post, Ocean Robbins, 2013 (Is founder and co-host (with best-selling author John Robbins) of the 90,000 member Food Revolution Network, an initiative to help you heal your body, and your world... with food.) “Is Genetically Engineered Salmon Safe?” <http://www.huffingtonpost.com/ocean-robbins/is-genetically-engineered_b_2522547.html>

Because AquaAdvantage fish grow many times faster, and become mature much more quickly, than wild salmon, they may have the ability to outcompete wild salmon for food, and to reproduce at a much faster rate. But if the fish escape into the wild, they won’t stop swimming at national borders. This means that if they survive in the wild anywhere, they may soon be driving wild salmon into oblivion everywhere. The impact on marine and freshwater ecosystems, and on the economic wellbeing of fish-dependent coastal communities, could be devastating.

Impact: Fish parasites and disease spread faster

Forbes magazine 2015. (journalist Faye Flam, award winning journalist on math, astronomy, and health) “FDA OKs GMO Salmon: Here Are The Benefits And Risks” 19 Nov 2015 <http://www.forbes.com/sites/fayeflam/2015/11/19/the-benefits-and-risks-of-newly-approved-gmo-salmon/#29b8b5ce33a9>

Other experts worried that the GMO fish could be more vulnerable to parasites or disease outbreaks that could spread to other fish. Already the waste from fish farming can be an environmental hazard. The most serious concerns center on the environment – not the health of individuals who might eat GMO salmon. If society doesn’t need a new, faster-growing salmon, why take any risk?

2. The Open Door, or Pandora’s Box

Link: Approval of GMO salmon opens a dangerous door.

**“Even if” you buy AFF’s arguments that GMO salmon are perfectly safe, it will lead to the acceptance of other modified foods that are not following the same safety standards**

Karin Klein 2014 (journalist) LOS ANGELES TIMES 3 Mar 2014 “U.S. stores say no to genetically engineered salmon. Someone has to.” <http://www.latimes.com/opinion/opinion-la/la-ol-gmo-salmon-20140303-story.html>

Another consideration, which the FDA doesn’t talk about, is the opening of a door. This one operation might sound good to the agency (though it sounds like a potential environmental problem to me), but it would be a [very small](http://www.nature.com/news/transgenic-salmon-nears-approval-1.12903) operation. The fish from this one farm would be a blip on the fish-market scene. However, once the U.S. market has been opened to these fish, the business would grow, the proposals would go on and it’s practically a given that not all of the subsequent operations would be carefully designed and run.

Link: Approval of GMO salmon will lead to approval of GMOs elsewhere in the world

Ben Goldfarb 2015 (journalist) HIGH COUNTRY NEWS 27 Nov 2015 “Will GMO salmon harm Alaska’s fishing industry?” <https://www.hcn.org/articles/will-genetically-modified-salmon-harm-alaskas-fishing-industry>

But while it's hard to imagine many European nations embracing AquAdvantage salmon anytime soon, the FDA’s seal of approval could convince hesitant countries elsewhere to issue their own green lights. It may also give other aspiring genetic modifiers the confidence to proceed with research and development. "There's been a feeling that many companies have been waiting to see if the US will approve GM salmon before going ahead themselves," Helen Sang, a genetic researcher at the University of Edinburgh, [told the BBC](http://www.bbc.com/news/science-environment-34869556).

Link: Salmon approval opens the floodgates, and they will always prioritize profits over safety

Prof. Joseph Palermo 2016. (Professor of History, California State University, Sacrament;Master's degree and Doctorate in History from Cornell University; Bachelor's degrees in Sociology and Anthropology from the University of California, Santa Cruz;Master's degree in History from San Jose State Univ.) 4 Jan 2016 “Frankenfish Wins FDA Approval” <http://www.huffingtonpost.com/joseph-a-palermo/frankenfish-wins-fda-appr_b_8911892.html>

The FDA has opened up the floodgates of corporate America to a whole new world of agricultural genetic manipulation. Critics of the new salmon species will be dismissed as Luddites or ignorant of the “science.” But you can be perfectly comfortable with scientific innovation without jumping on board a corporate driven process that will always put making a profit over the public’s right to question the long-term ecological or health effects of Frankenfish, hence, AquaBounty’s glee at not having to label their new “brand.”

Impact: Risks of economic and ecological damage

[Dhan Prakash](http://www.hindawi.com/49540680/), [Sonika Verma](http://www.hindawi.com/31592057/), [Ranjana Bhatia](http://www.hindawi.com/89385240/), and [B. N. Tiwary](http://www.hindawi.com/78263080/) 2011 (Prakash and Bhatia - Institute of Microbial Technology, Chandigarh, India. Verma – Dept of Biotechnology, UIET, Punjab University, India. Tiwary - Department of Biotechnology, Guru Ghasidas Vishwavidyalaya (A Central University), Bilaspur, India) Risks and Precautions of Genetically Modified Organisms ISRN ECOLOGY Vol 11 <http://www.hindawi.com/journals/isrn/2011/369573/>

2. Risks Related to the Use of Genetically Modified Organisms Ecological Stability of the GMO  
The application of genetic modification allows genetic material to be transferred from any species into plants or other organisms. The introduction of a gene into different cells can result in different outcomes, and the overall pattern of gene expression can be altered by the introduction of a single gene. The sequence of the gene and its role in the donor organism may have a relatively well-characterized function in the organism from which it is isolated. However, this apparent “precision” in the understanding of a gene does not mean that the consequences of the transfer are known or can be predicted [[15](http://www.hindawi.com/journals/isrn/2011/369573/#B21)]. Copies of a gene may be integrated, additional fragments inserted, and gene sequences rearranged and deleted—which may result in lack of operation of the genes instability or interference with other gene functions possibly cause some potential risks [[16](http://www.hindawi.com/journals/isrn/2011/369573/#B14)]. Therefore, there could be a number of predictable and unpredictable risks related to release of GMOs in the open environment. The report prepared by the Law Centre of IUCN, the World Conservation Union (2004), enlists numerous environmental risks likely to occur by the use of GMOs in the field. These risks are as follows.   
Each gene may control several different traits in a single organism. Even the insertion of a single gene can impact the entire genome of the host resulting in unintended side effects, all of which may not be recognizable at the same time. It is difficult to predict this type of risk.  
Genetic Contamination/Interbreeding  
Introduced GMOs may interbreed with the wild-type or sexually compatible relatives. The novel trait may disappear in wild types unless it confers a selective advantage to the recipient. However, tolerance abilities of wild types may also develop, thus altering the native species’ ecological relationship and behaviour.  
Competition with Natural Species  
Faster growth of GMOs can enable them to have a competitive advantage over the native organisms. This may allow them to become invasive, to spread into new habitats, and cause ecological and economic damage.  
Increased Selection Pressure on Target and Nontarget Organisms  
Pressure may increase on target and nontarget species to adapt to the introduced changes as if to a geological change or a natural selection pressure causing them to evolve distinct resistant populations.  
Ecosystem Impacts  
The effects of changes in a single species may extend well beyond to the ecosystem. Single impacts are always joined by the risk of ecosystem damage and destruction.

3. Health Risks

Increased risk of cancer

Food and Water Watch, 2011 (Food & Water Watch is a Washington, D.C.-based non-governmental organization and consumer rights group which focuses on corporate and government accountability relating to food, water, and fishing.) “Below the Surface: The Dangers of Genetically Engineered Salmon” <https://www.foodandwaterwatch.org/sites/default/files/below_the_surface_ge_salmon_fs_june_2011.pdf>

AquaBounty’s GE salmon would be raised in farms and would likely have many of the same nutritional differences that unaltered farmed salmon already have in comparison to wild salmon. These differences include lower levels of omega-3 fatty acids and higher levels of contaminants like polychlorinated biphenyls (PCBs). GE salmon have different vitamin, mineral and amino acid levels than non-GE salmon, and GE salmon also have slightly higher levels of insulin-like growth factor 1 (IGF-1), which has been shown to increase the risk of certain cancers.

Allergic reactions

Food and Water Watch, 2011 (Food & Water Watch is a Washington, D.C.-based non-governmental organization and consumer rights group which focuses on corporate and government accountability relating to food, water, and fishing.) “Below the Surface: The Dangers of Genetically Engineered Salmon” <https://www.foodandwaterwatch.org/sites/default/files/below_the_surface_ge_salmon_fs_june_2011.pdf>

GE foods have also been found to cause allergic reactions. Since no long-term studies on the safety of consuming transgenic fish have been conducted, the consequences of approving these GE salmon as a food for humans are almost entirely unknown.

Too many Unknowns

Forbes magazine 2015. (journalist Faye Flam, award winning journalist on math, astronomy, and health) “FDA OKs GMO Salmon: Here Are The Benefits And Risks” 19 Nov 2015 <http://www.forbes.com/sites/fayeflam/2015/11/19/the-benefits-and-risks-of-newly-approved-gmo-salmon/#29b8b5ce33a9>

The company scientists said that even five years ago they’d done extensive testing on the nutritional quality of the fish. The downside comes down to unknowns. The ones that experts have brought up include the potential for triggering allergies, and the concern that some of these fish might escape. If even a tiny fraction aren’t sterile, they could mix with other salmon and change the whole population in an irreversible way.

4. Lose the Right to Know

Link: AFF plan cancels the labeling requirement and sends the salmon immediately to market

Link: SQ law allows GMO salmon once labeling rules are finalized

*WASHINGTON POST 2015. (journalist Brady Dennis)17 December 2015, “FDA must develop plan to label genetically engineered salmon, Congress says”* [*https://www.washingtonpost.com/news/to-your-health/wp/2015/12/17/congress-to-fda-no-genetically-engineered-salmon-in-supermarkets-unless-it-is-labeled/*](https://www.washingtonpost.com/news/to-your-health/wp/2015/12/17/congress-to-fda-no-genetically-engineered-salmon-in-supermarkets-unless-it-is-labeled/)

In two paragraphs on page 106, lawmakers instructed the Food and Drug Administration to forbid the sale of genetically engineered salmon until the agency puts in place labeling guidelines and "a program to disclose to consumers" whether a fish has been genetically altered. The language comes just a month after FDA made salmon the first genetically modified animal approved for human consumption and represents a victory for advocates who have long opposed such foods from reaching Americans' dinner plates. At the very least, they say, consumers ought to know what they are buying.

Brink: No manufacturer will label GMO salmon voluntarily

*WASHINGTON POST 2015. (journalist Brady Dennis)17 December 2015, “FDA must develop plan to label genetically engineered salmon, Congress says”* [*https://www.washingtonpost.com/news/to-your-health/wp/2015/12/17/congress-to-fda-no-genetically-engineered-salmon-in-supermarkets-unless-it-is-labeled/*](https://www.washingtonpost.com/news/to-your-health/wp/2015/12/17/congress-to-fda-no-genetically-engineered-salmon-in-supermarkets-unless-it-is-labeled/)

"There's a question as to whether this fish should even be called a salmon," said Sen. Lisa Murkowski (R-Alaska), who pushed for the additional language. "The FDA made no mandatory labeling requirement. Instead, they said it could be labeled voluntarily. But no manufacturer of a 'Frankenfish' is going to label it as such.

Impact: Rights violated. Consumers have a right to know what we are eating

The Washington Post, December 2015, By Brady Dennis (Reporter for the Washington Post) “FDA must develop plan to label genetically engineered salmon, Congress says” <https://www.washingtonpost.com/news/to-your-health/wp/2015/12/17/congress-to-fda-no-genetically-engineered-salmon-in-supermarkets-unless-it-is-labeled/>

Lisa Archer, director of the food and technology program at the Friends of the Earth, said the advocacy group would continue to keep pressing to have labels on all genetically modified foods, but the salmon provision was a good start. "The vast majority of people want GMO labeling, and Friends of the Earth and our allies will continue to fight for our basic right to know what we are feeding our families," she said in a statement.

5. Increased salmon feed consumption

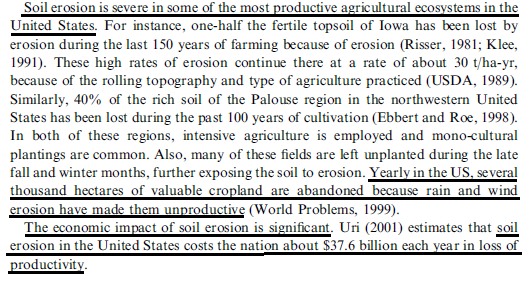
Link: GE salmon will increase consumption of smaller fish used for feed. Impacts: Leads to soil erosion, deforestation and harms local communities in Latin America

Food and Water Watch, 2011 (Food & Water Watch is a Washington, D.C.-based non-governmental organization and consumer rights group which focuses on corporate and government accountability relating to food, water, and fishing. Food and Water Watch employs a four pronged effort focusing on public and policymaker education, lobbying, media, and Internet activism.) “Below the Surface: The Dangers of Genetically Engineered Salmon” <https://www.foodandwaterwatch.org/sites/default/files/below_the_surface_ge_salmon_fs_june_2011.pdf>

Instead of increasing world food supplies and reducing pressure on wild fish, GE salmon pose a significant threat to wild fish and the people who depend upon them. Farmed fish like salmon are typically given feed that includes smaller, wild fish, which are a critical food source for both marine wildlife and people in many coastal areas worldwide. Growing GE fish could increase demand for feed and thereby increase this demand. Production of alternative feeds containing soy has already been shown to threaten biodiversity, cause soil erosion, increase deforestation and harm local communities in Latin America.

Impact: Soil erosion causes economic and ecological damage

Prof. David Pimentel 2006 (College of Agriculture & Life Sciences, Cornell Univ.) Journal of Environment, Development & Sustainability, “SOIL EROSION: A FOOD AND ENVIRONMENTAL THREAT” <http://saveoursoils.com/userfiles/downloads/1368007451-Soil%20Erosion-David%20Pimentel.pdf>



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