H.R. 273 - Prevention of Escapement of Genetically Altered Salmon in the United States Act

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Introduction/Summary of the Bill

On July 29, 2021, Alaska Congressman (R) Don Young proposed three bills to the House Natural Resources Committee. This policy paper is on H.R. 273, or the Prevention of Escapement of Genetically Altered Salmon in the United States Act. This bill aims to stop the genetic engineered fish industry in order to protect the wild salmon fishing industry. In Congressman Young's words, this bill is "right for the fish industry, right for the species, and right for this committee" (Young, 2021). This bill would prohibit a person or company from shipping, transporting, selling and purchasing genetically altered salmon. This bill would also prohibit the release of these genetically altered fish into the natural environment. Exemptions from this bill include "Fish, fish parts, or products confined for scientific research or collected to enforce this bill" (H.R. 273).

Background of AquaBounty Inc. Salmon

Beginning almost 30 years ago, AquaBounty Inc. started working on its bioengineered salmon, AquAdvantage salmon. A genetic mixture of three different species, these transgenic salmon grow twice as fast and require 25 percent less food to reach the same weight as farmed salmon. Additionally, these salmon can be harvested at 18 months, compared to three years for wild salmon (Nordrom, 2020). So far, AquaBounty Inc. has one inland-based egg production facility in Prince Edward Island, Canada. These eggs are transported to their two inland-based fish production facilities, one in the highlands of Panama and one in Indiana.* In order to ensure the containment of these genetically engineered fish, AquAdvantage salmon are engineered to be sterile, triploid (contributing to infertility), and raised to be all-female (Van Eenennaam, 2019; Bodnar, 2019). Among these biological containment factors, AquaBounty Inc. uses environmental and physical containment techniques to ensure salmon eggs cannot escape. For example, numerous layers of filters, screens and nets are utilized, as well as chlorine in drains to kill eggs or fry that may slip through (Bodnar, 2019). AquaBounty Inc. also claims that nearby rivers of the facility have unsuitable habitats for surviving salmon due to factors like salinity and temperature (AquaBounty).

One of the biggest concerns regarding GMO salmon is the inevitability of these fish escaping, mating with, and devastating wild populations and/or outcompeting wild populations. This concern was the main driver for a lawsuit against the FDA after they approved AquAdvantage salmon as safe to eat without studying the effects of GE fish on the environment. See timeline below for further details.

*Indiana facility not approved until 2019

Background of AquaBounty FDA Regulations

- 2013
 - 1. Grocery chains, seafood companies, restaurants, and food service companies form a coalition pledging to not sell GM salmon.
 - a. Today, 80 grocery retailers with over 18,000 locations have signed this pledge (Friends of the Earth).

- 2015
 - 1. FDA (Food and Drug Administration) approves AquAdvantage salmon safe to eat and sell using the premarket FDA safety evaluation.
 - a. This is the first time any government in the world had approved commercially genetically engineered animals as food.
 - b. The National Marine Fisheries Service and U.S Fish and Wildlife Service were not given a chance to provide input or approve the FDA decision (Hardy, 2016).
- 2016
 - Center for Food Safety, Earthjustice, the Quinault Indian nation and other groups sue the FDA for their 2015 approval in the U.S. District Court for the Northern District of California. This lawsuit "challenged whether the FDA had the authority to regulate genetically modified animals as "animal drugs" under the 1938 Federal Food, Drug and Cosmetic Act. It also argued the agency failed to protect the environment and consult wildlife agencies in its review process, as required by federal law" (D'Angelo, 2016).
 - 2. Alaska Senator Lisa Murkowski (R) introduces language into the 2016 federal budget which bans the importation and sale of genetically engineered salmon until the "FDA publishes final labeling guidelines for informing consumers of such content" (FDA, 2019).
- 2017
 - 1. AquaBounty purchases facility in Albany, Indiana
- 2019
 - 1. USDA GMO labeling rule becomes effective on February 19, 2019
 - a. Fish must be labeled as "bioengineered" (Ruskin, L).
 - 2. FDA deactivates import and sale ban, allowing salmon eggs to be transported to Indiana facility to be raised into salmon
- 2020
 - 1. AquaBounty announces Mayfield, Kentucky as the potential next location for a new facility (Aquabounty, 2020).
 - 2. The Court rules in favor of the Center for Food Safety, Earthjustice, and the Quinault Indian nation. Federal Judge Vince Chhabria in San Francisco orders "federal regulators to re-evaluate safety of genetically modified salmon" on wild salmon and ecosystems if release were to happen (Poux, 2021). The court ruled that the FDA violated NEPA.
 - a. Allows engineered fish from Indiana to be sold, however, blocks growing or harvesting of engineered fish from anywhere by existing facilities "until the FDA complies with the court's ruling" (Poux, 2021).
 - b. The Court orders FDA to go back to the drawing board and thoroughly analyze the environmental consequences of an escape of genetically engineered salmon into the wild.

Background of Alaska Fishing Industry

Alaskans have generally opposed genetically engineered salmon, frequently calling them "Frankenfish."

Congressman Don Young, this bill's sponsor, has called genetically modified fish a "threat" to Alaskan fisheries (Young, 2021).). Alaska is the biggest fishing state, producing about 60% of the nation's commercial fisheries. Many Alaskan livelihoods depend on the commercial fishing industry, especially those of indigenous people. In fact, "native Alaskans are disparately impacted by the changes to the salmon populations" as "salmon accounts for about 75 to 80 percent of Yukon River tribal diets" (Wilcox, 2021). Wild salmon are threatened by warming waters which alter the distribution of salmon prey and the growth and survival rate of salmon themselves (Vincent-Lang, 2019). Additionally, declines in salmon size can be attributed to climate and competition at sea with hatchery-produced salmon. Currently, "seafood caught in Alaska accounts for 60 percent of the country's output (and 90 percent of wild salmon yield)" (Rodbard, 2015). Alaska's fishing industry supports not only thousands of jobs, but also "fishing families and entire communities including 11,000 permit holders, their crews, and over 20,000 processing workers annually" (King, 2019). It must be noted, however, that Alaska also has a huge hatchery industry. In fact, a third of all salmon harvested in Alaska is known as "hatch and catch," beginning life in one of the state's 31 hatchery facilities – owned mostly by private nonprofit corporations – and ending life in the wild (Leschin-Hoar, 2015). The hatchery programs date to the 1970s, a majority serving as "conservation hatcheries," for the purpose of supplementing wild runs. There is skepticism regarding the role hatchery salmon should play in Alaska. A main concern is how hatchery salmon interact and affect wild salmon, as well as seabirds (Sapin, 2021). For example, the reduced fitness of the offspring of wild salmon and hatchery salmon has been thoroughly studied (Loew, 2019). A second concern is the potential loss of jobs in the wild salmon industry. However, "hatchery production levels have remained stable in Alaska since the mid-1990s, and in the entire North Pacific since the mid-1980s" (Vincent-Lang, 2019). Hatchery fisheries do provide jobs and income, yet many Alaskans do not want that to come at a cost to wild fish, and those who work in wild fish commercial fishing. In terms of population trends, there is a paradox occurring in Alaska. In some fishing locations like Bristol Bay, salmon fisheries are booming while in British Columbia's Fraser River and on the Yukon River, populations are collapsing (Weiss, 2021). Scientists are unsure how long this boom, which is partly attributed to warming temperatures, can and will last (Weiss, 2021). The skepticism of hatchery salmon contributes greatly to the skepticism surrounding genetically engineered salmon.

Pros and Cons

*GE- Genetically Engineered

Pros

- GE Salmon grow twice as fast
 - Will be cheaper than farmed fish due to the reduced amount and cost of feed (Conrow, 2021).
- Provides a sustainable alternative to overfishing
- Alleviates pressure on wild salmon industry
- Will generate less pollution than farmed fish as they are grown in contained, inland pens rather than sea cages (Conrow, 2021).
 - Note, land-based farmed fish facilities do exist (Nordrom, 2020).
- FDA confirms AquaBounty salmon is nutritionally similar to farm-raised (hatchery) Atlantic salmon (Poux, 2021).

Cons

- GE Salmon has potential to trigger allergies though not confirmed by research yet (Flam, 2015; Pearson, 2017).
- GE Salmon has higher levels of cancer-causing hormone, Insulin-like growth factor 1 (IGF1)
 - FDA says there is no health risk as levels are not "statistically significant"
- Increased risk of transfer of antibiotic resistance between species
 - AquaBounty does not currently use antibiotics
- Inevitable potential to escape and consequential transgenic contamination
 - AquaBounty also says that it will only produce sterile females, but the evidence it submitted to FDA shows that it produces eggs that may be only 95% sterile (Wild Fish Conservancy, 2013).
- Farmed fish is much less nutritionally dense than wild-caught salmon (Cleveland Clinic).

Author Interpretation and Follow up Questions

This bill ignites a larger, and more complex conversation, that of GMO (Genetically Modified Organism) Food in general. There is large opposition to GMO food in the United States. Many food companies have taken the opportunity to utilize the non-GMO campaign as a marketing tactic, labeling their foods as non-GMO even if genetically modified versions of such foods do not exist. The truth of the matter is that genetically modified foods have been embedded in our food culture for almost 25 years. In fact, "in 2010, more than 80 percent of U.S. corn, soybeans, cotton, and sugar beets were GM varieties" (FAS). In 2016, 88% of the American Association for the Advancement of Scientists deemed GMOs safe (Pew Research Center). Many people also argue that GMOs are a solution to world hunger and food security. Personally, I have taken a pro-GMO stance. I will admit that researching GMO salmon made me question this stance. Despite any bias or opinions you may have, try to consider the significant implications of this bill as the first time a genetically engineered animal food has been put into the question.

Questions:

- 1. Which would you consider the more sustainable option supporting local, wild salmon fisheries or accepting Aquabounty's technology? Why?
- 2. If this bill is passed what are the implications for future genetically modified food and vice versa, what if this bill is not passed?
- 3. Is the threat of accidental escapement of GE salmon into our oceans bigger than the threat of unsustainable/overfishing?
- 4. Do you consider genetically modified salmon much different than genetically modified plants?

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