

Name: _____ Class: _____

Genetically Modified Salmon: Food or 'Frankenfish'?

By Monique Conrod
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Advancements in genetics have made it possible to grow plants that taste better, resist certain bacteria, or have a longer shelf-life at the supermarket. In fact, many fruits and vegetables that you find at the store have been genetically modified, meaning scientists have altered the plant's genes so that they will grow to have more beneficial qualities. Over the past few decades, a new company called AquaBounty Technologies has been developing a genetically modified animal — a salmon that grows twice as fast as regular salmon. As you read, take notes on both sides of the argument, and form your own opinion on whether genetically modified salmon should be approved as food.

- [1] A company called AquaBounty Technologies has created a new type of salmon that grows twice as fast as regular salmon. Now it wants permission to sell the salmon as food.



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But many people, including some scientists, say the company should not be allowed to farm or sell the salmon until we know more about the possible effects it could have on the environment and on human health.

The controversial fish, called the AquAdvantage salmon, has been genetically modified. That means some of its DNA has been artificially altered. (DNA is the information stored in the cells of an organism that determines the characteristics of that organism.)

The salmon is also "transgenic," which means genetic material from a different type of organism has been artificially added to the salmon's DNA.

- [5] About 25 years ago, a group of Canadian scientists wanted to create a strain of salmon that could survive in fish farms in the cold water off New Brunswick. They took genetic material from Chinook salmon and from an eel-like fish called the ocean pout and injected it into the eggs of an Atlantic salmon.

The result was a fast-growing fish that looks and tastes like a regular farmed Atlantic salmon. Some people call it a "super salmon," while others call it "Frankenfish," after the fictional monster created by Dr. Frankenstein.

In the early 1990s, the scientists teamed up with a U.S. company that wanted to produce the eggs commercially and sell them to fish farmers. But they faced a major obstacle: no government had ever approved a genetically modified (GM) animal as food.

The U.S. Food and Drug Administration (FDA), which regulates food in the United States, studied the salmon for several years. In 2010, they decided that the salmon was safe to eat and would have “no significant impact” on the environment — as long as it was raised in special facilities and could not accidentally be released into rivers or oceans.

But so many people objected that the FDA decided to reconsider its decision. They asked for comments from the public and received more than 35,000 responses. The FDA is still considering these comments and has not yet announced whether it will allow the salmon to be sold as food for humans.¹

- [10] In November 2013, the Canadian government gave AquaBounty Technologies permission to produce its transgenic salmon eggs at a hatchery in Prince Edward Island.

The fish live in special tanks inside the hatchery, and there are several filters and barriers designed to make sure transgenic salmon do not enter the natural environment. These fish are used to produce eggs that are then sent to a fish farm in Panama, in Central America, where they will grow to full size.

For now, the full-grown fish are buried in a pit near the fish farm because they cannot be sold for food.

Ron Stotish is the CEO (head) of AquaBounty Technologies. His company has conducted many experiments to show that the fish are not harmful to humans. They have spent a lot of money trying to get the salmon approved as human food.

He says the transgenic salmon look and taste just like regular Atlantic salmon, but because they grow so fast, they are ready to eat in 18 months instead of 36 months. And since the salmon are farmed, the supply is predictable and won't run out.

- [15] Stotish argues that raising transgenic salmon for food would actually be good for the environment because it would prevent the destruction of natural resources. He claims it might even end world hunger.

But many people disagree with Stotish and his plans to sell the salmon as food. They say there is not enough information available yet to know whether transgenic fish could be harmful to humans or to the environment.

One group in Prince Edward Island, called the Coalition for a GE-Free PEI, has organized public meetings and demonstrations against the hatchery.

Another group, called Ecojustice, has asked the Federal Court to review the government's decision to let AquaBounty produce GM eggs in PEI. They say the government did not have all the necessary information — like whether GM salmon could be harmful to the natural ecosystem and put wild salmon at risk if it escaped into the environment — before making the decision.

Ecojustice also says the government should have allowed members of the public to express their opinions about the hatchery. They are still waiting to find out if the court will review the decision.

1. At the time this news article was published, AquaBounty Technologies was still fighting for the FDA to approve the salmon to be sold as food. After more research studies and much debate, the FDA officially approved "super salmon" for sale in the U.S. in late 2015. However, because it was so controversial, President Obama put forth a bill that would require the salmon to be labeled as genetically modified before it could actually be sold in stores.

[20] Meanwhile, Canadians may already be eating GM food without realizing it. Genetically modified versions of tomatoes, corn, soya, canola, squash, milk products and other foods are grown and sold in North America.

Many of these are used as ingredients in other food products. While some countries require manufacturers to say on the label whether a product contains genetically modified ingredients, Canada does not.

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Text-Dependent Questions

Directions: For the following questions, choose the best answer or respond in complete sentences.

1. PART A: Which of the following statements best describes a central idea of the text? [RI.2]
 - A. AquAdvantage salmon is proven to have health risks that regular Atlantic salmon does not.
 - B. AquAdvantage salmon has DNA from other fish that lets it grow faster and in different conditions than regular Atlantic salmon.
 - C. AquAdvantage is cheaper to produce than regular Atlantic salmon, although it is more expensive to house in artificial tanks.
 - D. AquAdvantage salmon uses DNA from other fish to grow faster than regular Atlantic salmon, but it does not grow as large.

2. PART B: Which paragraph from the article best supports the answer to Part A? [RI.1]
 - A. Paragraph 3
 - B. Paragraph 7
 - C. Paragraph 14
 - D. Paragraph 15

3. In the article, what causes conflict between the American public and the U.S. Food and Drug Administration (FDA)? [RI.3]
 - A. The FDA never asked the public for its thoughts on approving transgenic salmon as food.
 - B. The FDA ignored the public's comments on the FDA's approval of transgenic salmon as food.
 - C. The FDA denied its approval of transgenic salmon as food after listening to public concerns.
 - D. The FDA temporarily reversed its approval of transgenic salmon as food after listening to public concerns.

4. Which statement best describes how paragraphs 20-21 contribute to the reader's understanding of genetically modified food? [RI.5]
 - A. They show why shoppers have been happy to buy genetically modified plants but not animals.
 - B. They show why manufacturers should include warnings that a food has been genetically modified.
 - C. They show that people already eat genetically modified plant food without any issues or protest.
 - D. They show that the FDA did not take people's complaints about approving genetically modified animals for food seriously.

5. How does the author convey multiple points of view on transgenic salmon in the article? Cite evidence from the text in your answer. [RI.6]

Discussion Questions

Directions: *Brainstorm your answers to the following questions in the space provided. Be prepared to share your original ideas in a class discussion.*

1. Based on what you have learned in science class, what might happen if AquaAdvantage Salmon were released into the wild? List all of the possible effects.
2. In your opinion, should the new salmon be approved as food? Explain your position.
3. Should the government require a label for genetically modified food? Why or why not?
4. Is it important that the Canadian government and the United States FDA come to the same conclusion about genetically modified salmon? Why or why not?
5. Advancements in genetics have made it possible for humans to design new organisms with more desirable characteristics. Some people worry that this technology could be taken too far. Others argue that we should embrace the new technology. Take a stand, and summarize your position.