

Farm-raised Fish

Introduction

I chose farm-raised fish as the topic for my fact sheet. There are several reasons why this topic interests me. First and foremost, I enjoy eating fish. By researching this topic, I can gather valuable information regarding the health risks involved with consuming certain types of fish. Another reason why this topic interests me is that I am an avid fisherman. I have always preferred to eat the fish I catch in the wild rather than store-bought, or restaurant fish. Studying fish farming could verify my view that wild-caught fish is healthier than farm-raised fish. In addition, an episode of “Dirty Jobs” on the Discovery Channel sparked my curiosity on this topic. In this episode, the host visits a Tilapia fish farm and learns that the fish are fed the excrement of another species of fish. Besides thoroughly disgusting me, this television program led me to wonder if using excrement as a food source was a common practice at fish farms.

Section 1: Background and Problem Statement

Web site #1 Name: Farm Raised Fish Not So Safe

- Web address: <http://www.nutritionresearchcenter.org/healthnews/farm-raised-fish-not-so-safe/>
- Background Information:

HP 2010 does not have any information regarding farm-raised fish. Fish farming is a form of aquaculture. Aquaculture is the cultivation of aquatic organisms in a controlled environment. Salmon is a popular choice for fish farmers due to high consumer demand for this particular species. Salmon raised in farms have considerably higher levels of Polychlorinated biphenyls, or PCBs, than salmon caught in the wild. PCBs are toxic organic pollutants that are harmful to humans. The PCBs found in farm-raised salmon stem from feed obtained from high pollution areas. Since fish farmers intentionally fatten

the salmon, and PCBs collect in fat, farm-raised salmon have considerably higher amounts of PCBs per ounce than leaner, more muscular wild salmon. In addition, farmed salmon tissue has been found to contain higher levels of 151 chemical contaminants typically found in both farmed and wild salmon (par. 1, 6).

Web site #2 Name: Fuss over Farming Fish

- **Web address:** <http://www.gi.alaska.edu/ScienceForum/ASF9/984.html>
- **Background Information:**

Fish raised in farms live in close quarters. A typical salmon farm concentrates 50,000 to 100,000 fish in a two-acre space. Crowded conditions increase the risk of disease within the farm. It is not uncommon to import foreign, non-native stocks into fish farms. Imported fish stocks run the risk of bringing imported diseases that, through escaping fish and drifting waste, can spread to local free-ranging populations. An example of this phenomena occurred in 1989 when viral hemorrhagic septicemia, a disease never before seen in North America, was found in stocks of Scandinavian salmon in fisheries on the west coast of the United States (par. 5, 7, 8).

Web site #3 Name: Communicable Bacterial Diseases in Fish Farming

- **Web address:**
http://www.ars.usda.gov/research/publications/publications.htm?seq_no_115=162981
- **Background Information:**

A major limiting factor in the expansion of fish farming is the impact of communicable diseases caused by Gram-positive and Gram-negative bacteria. Frequent use of antibiotics in fish farms has led to the development of antibiotic-resistant bacteria. These bacteria have increased the frequency of communicable disease outbreaks in fish farms. Infections from antibiotic-resistant bacteria have become a growing health crisis because they are increasingly difficult and expensive to treat (par. 1,2).

Section 2: Research

Web site #1 Name: Pub Med

- Web address: <http://www.ncbi.nlm.nih.gov/pubmed/16769049?dopt=Abstract>
- Summary of the research:

In this study, wild-caught and farm-raised fish fillets from fish markets and chain super markets in North Carolina, Maryland, and Washington, D.C. were measured for polychlorinated biphenyl (PCB) and polybrominated diphenyl ether (PBDE) levels. Wild bluefish and rockfish had higher levels of PCBs and PCDEs than farm-raised salmon. However, the research also shows that farm-raised salmon had significantly higher levels of PCBs and PCDEs than wild salmon (par. 1)

Web site #2 Name: Farmed Salmon More Toxic than Wild Salmon, Study Finds

- Web address: <http://newsinfo.iu.edu/news/page/normal/1225.html>
- Summary of the research:

Organochlorine toxin levels were taken in roughly 700 wild and farmed salmon for this study. The farm-raised samples were taken from retailers and wholesalers from areas across North America, Europe, and Chile. These samples were compared to five different species of wild salmon from the Pacific Ocean. These species included Chinook, Coho, chum, pink, and sock-eye. Using gas chromatographic high-resolution spectrometry, the researchers analyzed the levels of 14 organochlorine toxins in salmon from each collection site. Many of the toxins tested have been proven to be carcinogenic to humans. The aggregated results showed that farm-raised salmon had significantly higher levels of 13 out of the 14 toxins than wild salmon. Researchers also measured toxin levels in the salmon feed used in fish farms. These measurements showed a strong correlation between the toxicities of the feed and the salmon. The correlation suggests that the toxins in the salmon come from the feed (par. 7-10).

Web site #3 Name: Diversity of Tetracycline Genes in Bacteria from Chilean Salmon Farms

- Web address: <http://www.ncbi.nlm.nih.gov:80/pmc/articles/PMC149303/>
- Summary of the research:

Chile has the second-largest producer of farm-raised salmon in the world. The most common antimicrobial agent used in Chilean fish farms is Oxytetracyclin. This study found that in the four fish farms examined, 25 distinct tetracycline-resistant gram-negative bacteria were present. The researchers were able to gather bacteria samples from salmon culture tanks, water entering and leaving the pond, surface water, the fish themselves, and even the fish food (par. 1-3).

Section 3: Statistics

Web site #1 Name: World Fish Stocks, Fisheries Maps, Aquaculture Statistics

- Web address: <http://www.theglobaleducationproject.org/earth/fisheries-and-aquaculture.php>
- Summary of the Statistics:

World aquaculture production has grown steadily from the 1950s to the 1970s. The steady growth was replaced by a sharp increase starting in the early 1980s and continuing into the 2000s. The rise is a response to constant human population growth and the subsequent demand increases for edible fish. Advances in aquaculture technology and the leveling off of total wild fish catch per capita have also contributed to the rise in fish farming. While farm fishing has lowered fish prices and made fresh fish more available, it has also caused increased exposure to harmful contaminants and heavy metals found in farm-raised fish (graphs 7, 8).

Web site #2 Name: Feeding Farmed Salmon

- Web address: <http://www.puresalmon.org/feed.html>
- Summary of the statistics:

Salmon in fish farms require vast amounts of wild fish for food. Three pounds of wild fish, such as anchovies, mackerel, herring, sardines and menhaden, are required for every pound of farm-raised salmon. Two-thirds of a farmed salmon's diet comes from fishmeal and fish oil, which can only be produced from wild baitfish. The world's salmon farms use about 573,000 tons of fishmeal, and 409,000 tons of fish oil annually. The result is net loss of fishery resources. The depletion of the species used in obtaining fishmeal and fish oil can drastically affect the fragile ecosystems and food chains to which they belong. Worldwide estimates of wasted salmon feed reach up to 300,000 tons annually. This uneaten food falls to the bottom and has been shown to cause eutrophication (loss of oxygen) in adjacent waters (par. 1-5).

Web site #3 Name: Fish Farming May Soon Overtake Cattle Ranching As a Food Source

- Web address: http://www.earth-policy.org/index.php?/plan_b_updates/2000/alert9
- Summary of the statistics:

Aquacultural output has been growing 11 percent per year over the past decade. Fish farming increased from 13 million tons produced in 1990 to 31 million tons produced in 1998. This rapid growth has made aquaculture the fastest growing sector in the world food economy. About 85 percent of fish farming takes place in developing countries. China alone produced 21 million of the world's 31 million tons of aquaculture produced. Of all the species raised in fish farms, salmon is the most environmentally destructive (par. 1,4,12).

Section 4: Consumer Information

Web site #1 Name: Quantitative Analysis of the Benefits and Risks of Consuming Farmed and Wild Salmon

- Web address: <http://jn.nutrition.org/cgi/content/abstract/135/11/2639>
- Summary of the Information:

Farm-raised salmon contain (n-3) fatty acids that are beneficial to the body. These acids include eicosapentaenoic acid (EPA), and docosahexaenoic acid (DHA). However, one cannot achieve the recommended levels of EPA and DHA from farmed salmon while maintaining an acceptable carcinogenic risk. Young children, pregnant women, nursing mothers, and women of child-bearing age should minimize contaminant exposure by selecting wild salmon, or finding other sources of (n-3) fatty acids (par. 1).

Web site #2 Name: Farmed Salmon Exposed

- Web address: <http://www.farmedsalmonexposed.org/theproblem.html>
- Summary of the Information:

Since farmed salmon do not have a wild diet, they usually have a different hue than their wild counterparts. To make the salmon appear more natural and appetizing, fish farmers add chemicals to the feed to produce artificial color. The high concentration of polychlorinated biphenyls and other contaminants have led some scientists to recommend limiting farmed salmon consumption to one salmon meal every five months.

Web site #3 Name: Health Effects of Eating Contaminated Fish

- Web address: <http://www.pvsfish.org/health-effects.html>
- Summary of the Information:

There are no immediate effects from eating fish contaminated with DDTs and PCBs. Consuming numerous contaminated fish causes the harmful chemicals to accumulate within the body. The accumulation of these contaminants have been linked with cancer, liver disease, and developmental defects. Women can pass DDTs and PCBs to their children through lactation and pregnancy. Young children and women of child-bearing are the most at risk for health problems associated with contaminated fish (par. 2, 3).

Section 5: Solutions to the Problem (or Issue)

Web site #1 Name: "Pure Salmon Campaign"

- Web address: <http://www.puresalmon.org/solutions.html>

- **Summary of the Information:**

The Pure Salmon Campaign is a global initiative focused on improving the way salmon is produced. Partners in the United States, Canada, Europe, Australia and Chile are all working together to achieve the goal of farming salmon that is safe for human consumption and does not adversely affect the environment. One of the Pure Salmon Campaign's possible solutions to many of the problems salmon farming poses is closed containment. This solution would involve housing the fish in impermeable tanks rather than cages. The tanks, constructed from fiberglass, cement, or heavy gage plastic would prevent the transmission of parasites and diseases to wild populations. Excrement and uneaten fish feed could be filtered out of the tanks rather than simply sinking to the bottom, causing harm to the surrounding sea life. These tanks would require less of the potentially harmful chemicals used to sterilize traditional fish farms. High costs are the most significant barrier blocking the implementation of closed containment fish farms (par. 2-4).

Web site #2 Name: Expose Farmed Salmon and Demand Better Farming Practices

- **Web address: http://actionnetwork.org/campaign/farmed_salmon**
- **Summary of the Information:**

Farmed Salmon Exposed is a cooperation of partners around the globe who aim to take action against the fish farming conglomerates and their unhealthy farming techniques. One method employed by this organization is a petition to use safer farming practices that can be sent directly to Geir Isaksen, CEO of Cermaq, the largest salmon farmer in the world. Farmed Salmon Exposed also organizes regional events to raise awareness of the issue (par. 1).

Web site #3 Name: The Salmon Farm Monitor

- Web address: <http://www.salmonfarmmonitor.org/action.shtml>
- Summary of the Information:

The Salmon Farm Protest Group (SFPG) is a collection of responsible fish farming advocates led by Chairman Bruce Sandison. The SFPG focuses its efforts on Scottish salmon farms; the SFPG proclaims that Scottish farmed salmon is one of the most contaminated items found on supermarket shelves. The SFPG encourages the boycott of Scottish salmon, as well as all farmed-raised salmon. In addition, the SFPG provides an extensive list of contacts in the Scottish press and encourages concerned citizens to write to these contacts in order to expose the issues (par. 1, 2).

Back to Betty C. Jung's Web site	http://www.bettycjung.net
Back to Fact Sheet Directory	http://www.bettycjung.net/Pch202fs.htm