Food Researched: Salmon
Focus of Research: History
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Title
The History and Development of the Salmon Fishing and Farming Industries

Objective(s)
This paper looks at the early development of fish farming techniques around the world with a focus on the industry in the United States. It will also discuss the development of commercial salmon fishing. In addition to industry development it will also discuss the history of relevant government policies and organizations that have impacted the salmon industry.

Summary of Findings

Historical development of Aquaculture

The practice of rearing fish in captivity, or rudimentary fish farming, goes back thousands of years. As early as the year 3500 BCE there is documentation of Carp being cultivated in China in using freshwater ponds and rice paddles. Other very early examples of fish farming include tilapia farming in Egypt in the year 3000 BCE and Oyster farming in Japan in the year 2000 BCE. ¹

Modern fish farming techniques were pioneered Norway and Scotland, the United States followed suit several years later.

“Aquaculture didn't become widely practiced in North America until the late 1900s. But, people were already exploring the possibilities in the United States and in Canada a few years earlier. In the United States, Stephen Ainsworth of West Bloomfield, N.Y. experimented with the cultivation of brook trout in 1859 [...]”

Although aquaculture has been practiced since ancient times, the greatest growth has occurred in the last two decades.”

Commercial farming was not widely present in the US until the 1970s.

**Historical Development of Salmon Aquaculture**

Modern day salmon farming has roots that extend as far back as the eighteenth century. The first fertilization trials for Atlantic salmon took place in Germany in 1763. Biologists in Scotland and France then further developed these techniques. Throughout the nineteenth century farming techniques continued to develop in Europe on small scale salmon farms. Soon after they began to establish hatcheries. The first hatchery for propagation of pacific salmon was developed in 1857.

The first commercial salmon farms were not developed until the 1960s in Norway and Scotland. By 1996 Salmon farming had overtaken salmon fishing as the number one producer of salmon meat and other salmon products in the world. Today Norway and Chile produce close to two thirds of the world’s farmed salmon population.

**The Development of Salmon Farming and Ranching Practices in the US**

The first farming practices in the U.S. were salmon hatcheries initiated on the west coast, primarily in California and Oregon. The first large scale private operation was titled Ocean Systems and established systems for coho and Chinook salmon in the Puget Sound region. They harvested their first fish in 1971. In 1974 Anadromous, Inc. and Oregon Aqua-Foods were both founded. These companies went on to become the most significant salmon farming operations in Oregon in the 1980s.

In 1995 a moratorium was placed on expanding the ranching industry, but it was lifted in 2002. Today salmon ranching remains the most popular method of salmon

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enhancement in the united stated. Unlike salmon farming, where salmon are kept in captivity until they are ready to be harvested, in salmon ranching the fish are kept in captivity only until they reach the smolt stage and are capable of hunting for their own food. These smolts are released by the thousands and can deplete the food supply for salmon that were born in the wild. ⁶

**Development of Feed in the Salmon Farming Industry**

Farmed Salmon feed can be very controversial. Salmon are carnivorous fish. They need omega 3 fatty acids in their food to fully develop. As early as the year 2000 the farming industry began to substitute large amounts of the protein in salmon feed, which previously came from anchovies and smaller fish, with vegetable proteins like soybean meal. This not only addresses the concern that the production of fishmeal is not sustainable; it also reduces the cost of the fish feed for the farming industry. Fish feed is the single most costly aspect of salmon farming. Other controversies surrounding salmon feed are the recent addition of dyes to color the salmon flesh and the correlation between harmful PCBs (Polychlorinated Biphenyls) in salmon meat from farmed fish and pollutants in the salmon feed. ³,⁴

**Rise in Salmon Demand**

“Once a luxury food, salmon is now one of the most popular fish species in the United States, Europe and Japan. Total salmon production has increased three-fold since 1980 to meet this demand” ⁷

Beginning in 1989 the consumption of salmon in the United States began to increase steadily. This increase is due partially to the increased ease of farming and importing salmon from other countries, which drastically lowered prices, and also partly due to the widely publicized health benefits of eating salmon. Large amounts of imported salmon that flooded the market were sold more cheaply. Between the years 2000-2004, Americans consumed an average of about 284,000 metric tons of salmon annually, a dramatic increase

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³ Knapp, G Roheim.
⁴ Bostick, Katherine
⁷ ibid
from the average 130,000 metric tons consumed in 1989. The majority of this salmon was imported pacific salmon that had been canned (See Fig 1)\(^8\).

**Aquaculture Regulations: The Global Aquaculture Alliance**

The Global Aquaculture Alliance was founded in 1997. The GAA the developed the Responsible Aquaculture Program and out of that program came the Best Aquaculture Practice (BAP) standards. As stated by the GAA the goals of the BAP standards are to:

“Address environmental and social responsibility, animal welfare, food safety and traceability in a voluntary certification program for aquaculture facilities. BAP certification defines the most important elements of responsible aquaculture and provides quantitative guidelines by which to evaluate adherence to those practices”

There are currently BAP certifications available for shrimp farms and hatcheries; salmon, tilapia, channel catfish and *Pangasius* farms; seafood processing plants and feed mills. To become certified a farm must apply and be subject to review by an inspector. The regulations for salmon farms include everything from fair wages and worker rights to water standards and fish feed regulations. \(^9\) The standards for salmon were finalized in June 2011, after a two years process, and in December of 2011 Brent Island Farms in Mainstream Canada became the first commercial salmon farm to earn the official BAP certification. \(^10\)

**Salmon Fishery Development in Alaska**

During the 1950's Alaska's commercial salmon fisheries harvested an annual average of 40 million salmon per year. This is significantly less than the 172 million salmon per year average that was recorded during the 1990s. In the 1960's, immediately after gaining statehood, Alaska began to regulate the salmon fishing within the state. Prior to the regulation many of the salmon runs in Alaska were near depleted, and both fisherman and wild salmon populations were suffering as a result. By implementing new regulations (see

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below) Alaska was able to turn fisheries around and maintain their economic profitability.¹¹

**Fishery Regulations**

In 1871 President Grant signed a bill creating the United States Commission of Fish and Fisheries and thereby recognizing a national need to preserve the dwindling wild populations of fish. This was the first government organization established to regulate a natural resource. In it’s early years the organization attempted to preserve wild populations by establishing Salmon hatcheries in areas where the wild population was declining. In 1902 the bureau was reorganized and became the modern day National Marine Fisheries Service. ¹²

The Limited Entry Act for commercial fishing in Alaska was passed in 1973. The goal of the act was to preserve natural wild salmon populations, as well as maintain profitability of the industry for the fisherman working in Alaska at the time. The act aimed to achieve this goal by granting “limited entry permits” that limiting the amount of new fisherman allowed to begin fishing commercially in Alaska, and the amount of fish that they are permitted to harvest.¹³

In 2002 there was yet another attempt to regulate the commercial fishing industry. A task force called the Joint Legislative Salmon Industry Task Force (JLSITF) was formed and met in Alaska with the stated goal of:

“Evaluat[ing] the State of Alaska’s statutory framework for Alaska’s wild salmon industry as well as current industry practices and to make recommendations for statutory, regulatory and structural changes that will improve the industry while recognizing Alaska’s coastal economy”

The task force formed subcommittees and held widely publicized meetings over the course of the year. The work of the committee is ongoing; they continue to meet regularly and to discuss methods of conservation with citizens and fisherman alike. ¹⁴

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Figure VIII-2: Estimated United States Fresh and Frozen Salmon Consumption: Domestic & Imported

Source: Estimated using the United States Salmon Market Database described in Appendix C.
Sources


<http://science.howstuffworks.com/environmental/life/zoo\logy/all-about-animals/aquaculture2.htm>.  
