

Is farmed salmon environmentally friendly?

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<https://www.norwegianamerican.com/farmed-salmon-mariculture/>

Farmed v. wild salmon

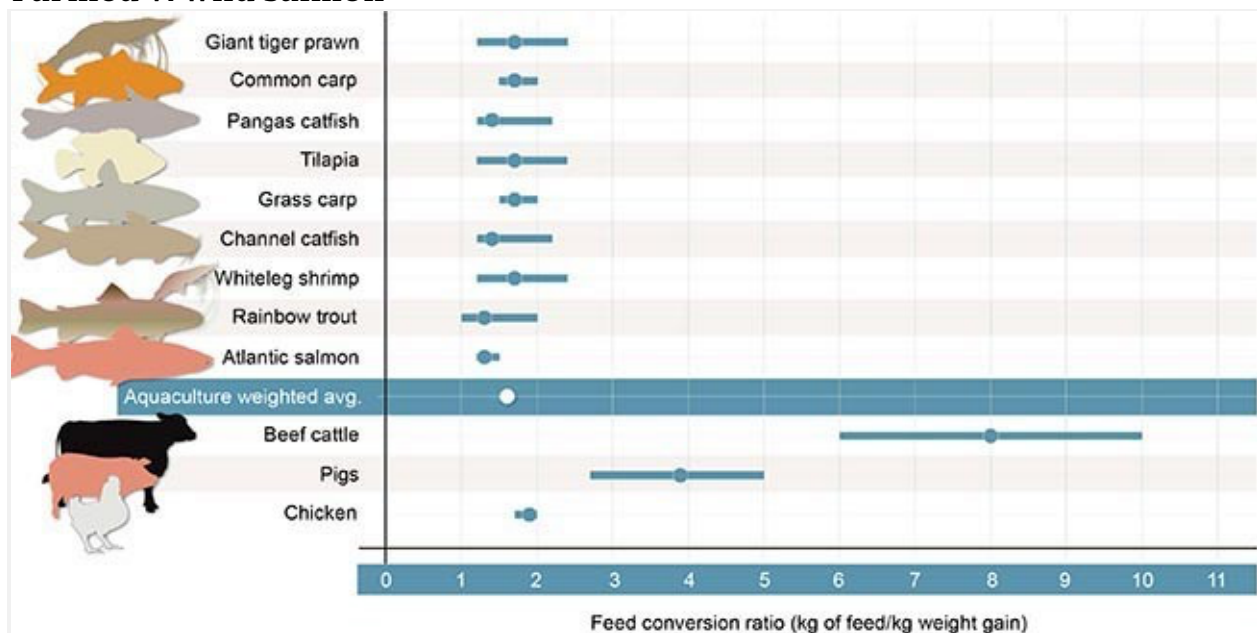


Image: Fry, J., Mailloux, N., et al. / *Environmental Research Letters*

The conversion of food mass into farmed animal flesh, expressed as a ratio. Farmed Atlantic salmon are similar to chickens but twice as efficient as raising pigs and four times more efficient than raising cattle.

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In the first installment of this two-part article ("Farmed v. wild salmon: Is farmed salmon safe and healthy?" www.norwegianamerican.com/features/farmed-salmon-safe-healthy) we examined the practice of farming of Atlantic salmon, particularly in Norway, the United States, and Canada. We saw that seafood was the second most important product of Norway, aside from oil, and that 70 percent of that product was farmed Atlantic salmon. Salmon farming has led to year-round availability of this highly nutritious food, which is often less expensive to buy than wild-caught salmon, particularly Pacific salmon. Salmon is a good source of protein and one of the few good sources of omega-3 fatty acids; the latter are required in our diet to ensure proper heart function and prevent strokes. We examined consumer

fears that farmed salmon, compared to wild caught, could potentially contain toxic PCB concentrations, antibiotics, diseases, or chemicals used to treat sea lice. Studies have largely put these fears to rest, as the World Health Organization has concluded that eating farmed salmon is as safe and as healthful as eating wild salmon.

In this concluding article, we look at the driver of modern salmon mariculture and the promise of this technology from an ecological standpoint. We also note some persistent environmental concerns.

More mouths to feed

Salmon farming and other new food-growing technologies have enjoyed increasing governmental and popular support in the last few decades because of their greater efficiency in growing food. The World Health Organization (WHO) estimates the human population currently at 7.3 billion, but by 2050, there will be an additional 3 billion people to feed. With natural and energy resources dwindling, arable land becoming scarcer, farming livestock becoming more expensive, and climates undergoing change, achieving a sustainable food supply is becoming more daunting than ever.

Farmed salmon as a source of protein, calories, and omega-3s is an attractive food source, because it requires a relatively low carbon footprint. Dr. Jill Rolland, director of the USGS Western Fisheries Research Center in Seattle notes that “farmed salmon have one of the highest feed conversion ratios,” estimated to be about 1.7:1, compared to 2:1 for chicken, 4:1 for pigs, and 8:1 for cattle (as reported by Fry et. al, 2018, *Environmental Research Letters*). That means that farmed Atlantic salmon gain 1 kilogram of mass for every 1.7 kg of food. So raising salmon for food is slightly more efficient than raising chickens, twice as efficient as raising pigs, and four times more efficient than raising beef cattle.

Salmon farming holds great promise as an efficient way to produce food and help secure the world food supply. Another potential benefit is relieving the fishing pressure on wild salmon populations, which are in trouble almost everywhere in the world. In Norway, the wild river salmon are about half of what they were in the 1990s, and recreational salmon fishing is now very restricted. So far it isn't clear whether the farming of salmon has enabled wild salmon populations to rebound, however. Salmon are threatened by a number of other factors, many of which are anthropogenic in origin.

Waste material, escape, and competition

Other impacts of salmon farming include the accumulation of fecal material and uneaten food on the seafloor below salmon pens if farms are not sited properly in areas flushed well by tidal currents. The

escape of salmon from their pens, especially in large numbers, has been a hot-button issue in the Pacific Northwest, among salmon farms in Washington (owned by Cooke Aquaculture Pacific) and Canadian British Columbia (owned largely by the Norwegian companies Grieg Seafood, Marine Harvest/Mowi, and Cermaq).

In early 2018, the escape of over 200,000 salmon from a farm in northern Puget Sound, coupled with violations of the farm's water-quality permit, prompted the Washington state government to impose a moratorium on salmon-farm permitting until salmon farms could be better regulated. In Puget Sound, the fear is that escaped Atlantic salmon could compete with dwindling populations of Pacific salmon for food, might spread disease, and could hybridize with wild salmon and dilute the gene pool, weakening the survival instincts required for successful salmon spawning.

Washington Department of Fish and Wildlife has not found any scientific evidence that escaped Atlantic salmon compete much with Pacific populations. It also appears that Atlantic salmon (genus *Salmo*) cannot successfully interbreed with Pacific salmon (genus *Oncorhynchus*). But the demand for tighter regulation of salmon farming, with respect to escapes but also food safety and quality, remain, not only in the United States but also in Canada and the European Union.

In conclusion, the UN Food and Agriculture Organization, through many scientific studies, finds that farmed Atlantic salmon has all the great health benefits of eating wild caught salmon: a great source of protein, calories, fats, and omega-3 fatty acids.

To learn more...

By necessity, this article greatly simplifies the controversy around a very complex topic. For a comprehensive review of salmon-farming science, check out the peer-reviewed article by Shepherd and Little, "Aquaculture: Are the Criticisms Justified?" (from the *World Agriculture Journal*, 2014: www.world-agriculture.net/article/aquaculture-are-the-criticisms-justified-feeding-fish-to-fish.) Additionally, the Seafood from Norway website offers the viewpoint of the Norwegian mariculture industry in an article entitled "The Truth About Norwegian Farm-Raised Salmon."



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