

# How Can Farmed Salmon Impact Your Health and the Environment?

Fact Sheet • August 2010

**D**o you know about the risks of farmed salmon? Learn more about human health implications, their effect on the marine ecosystem and your choices!

## Farmed Salmon Can Pose a Threat to Consumer Health

### *PCBs, dioxins and pesticides:*

Farmed salmon can contain, on average, higher concentrations of PCBs, dioxins, flame retardants, pesticides and other toxins than wild fish, and this is most likely

due to their diet.<sup>1</sup> It is true that these contaminants are sometimes present at low levels in wild salmon, as they have been introduced to the environment by human activities. However, commercial fish feed for salmon typically includes a highly concentrated amount of wild fish (ground up into fishmeal and fish oil), whose toxins are passed up the food chain from the fish eaten as food to the salmon, and on to consumers. One prominent study on this subject has suggested “consumption of farmed salmon may result in exposure to a variety of persistent bioaccumulative contaminants with the potential for an elevation in attendant health risks.”<sup>2</sup> Both PCBs and dioxins are considered potential carcinogens, meaning that they may cause cancer.<sup>3</sup>

Meanwhile, a study conducted by French investigative journalists in 2010 found scandalously high levels of toxic chemicals in Norwegian fish, which were attributed to the pesticides fed to farmed salmon to combat sea lice. The journalists talked with an anonymous salmon farmer who confirmed usage of a pesticide called diflubenzuron, and said he’d seen fish and sharks in the vicinity of his farm die after consuming his farmed salmon. He said he wouldn’t eat his fish himself.<sup>4</sup>

### *Antibiotics*

The antibiotics often used in salmon production can harm consumers. Residues of these drugs may be found in the farmed salmon and passed on to those that eat them. For many people with allergies to antibiotics, seafood with antibiotic residues may cause unexpected allergic reactions. In Chile, some aquaculture operators have allegedly used 75 times more antibiotics than farms in Norway.<sup>5</sup>



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## Salmon Farms Can Pollute the Environment and Disrupt Marine Ecosystems

### *Pollution*

Thousands of salmon concentrated in one area produce large amounts of waste that flow straight into the ocean. For example, it has been estimated that an industrial farm with 200,000 salmon may produce about the same amount of fecal matter as 65,000 people.<sup>6</sup> Untreated fish waste and excess feed may drift from nets or cages into coastal waters, which can result in water pollution and harm surrounding marine habitats.<sup>7</sup> There is some evidence that buildup of such wastes, which are often rich in nitrogen, may contribute to the prevalence and intensity of dead zones and toxic algal blooms.<sup>8</sup>

### *Altering the marine ecosystem*

Salmon farms may use antibiotics, fungicides and pesticides to try to control parasites, prevent infections and stop the spread of diseases. These chemicals can harm beneficial seafloor bacteria and may develop antibiotic-resistant organisms<sup>9</sup> which can then cause problems for wildlife and even human health. Some pesticides used to combat sea lice have proven deadly to creatures like lobsters and shrimp.<sup>10</sup>

### *Feed*

Salmon are carnivorous and often eat other fish for protein in their diet. To feed farmed salmon, wild prey fish — such as anchovies or sardines — are often taken out of the ocean and processed into fishmeal or oil. These prey fish are a crucial part of the marine ecosystem, serving as food for marine mammals, birds and other larger fish. Taking prey fish from the oceans to feed farmed fish can disrupt ecological balance. The aquaculture industry consumes 87 percent (0.78 million tons) of the fish oil produced worldwide — and more than half of that fish oil is used to feed farmed salmon alone.<sup>11</sup>

## Salmon Farms Can Harm Wild Salmon Populations

### *Escapes*

In the North Atlantic, about 2 million farmed salmon escape each year from their net pens due to equipment failure, severe weather and human error. This causes



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serious problems for regional wild salmon populations. While the industry claims that such fish frequently stay close to the site of escape, there is evidence to suggest that some farmed salmon may stray far from their pens once they escape.<sup>12</sup> Wild salmon are thus forced to compete with escaped farmed salmon for food, and interbreeding can weaken populations by reducing genetic diversity.<sup>13</sup> The farmed fish are often bred to grow larger and faster than wild fish, and may be more aggressive, too.<sup>14</sup>

### *Disease/Parasites*

Farmed salmon are typically raised in net pens along the coast that allow water to flow freely through them. They are kept in much higher concentrations than would be normal in the wild. The cramped quarters, concentrated fish wastes, stress and other factors create ideal conditions for disease and parasites to develop. Because water flows straight through the pens, these can spread to wild salmon populations and contaminate other marine wildlife.

For example, a study of wild pink salmon populations in British Columbia, Canada, in 2007 showed that parasitic lice infections from salmon farms were devastating wild fish populations. With mortality estimates in some populations over 97 percent, wild pink salmon are being pushed close to extinction.<sup>15</sup>

In another example, an outbreak of infectious salmon anemia (ISA) in Chile devastated the country's salmon-farming industry from 2007 through 2009, leading operators to slaughter more than 1 million fish in an attempt

to contain the disease.<sup>16</sup> It was recently determined through genetic testing that the disease had originated at Norwegian salmon farms in 1996 — demonstrating that the outbreak “probably circulated undetected for more than ten years,” according to the lead author of the study.<sup>17</sup>

## Community Opposition and Consumer Response

It is frequently argued by the salmon industry that farms provide benefits to the community in the form of employment. However, the industry can be dangerous to workers, is geared toward consolidation and is inherently unstable due to sudden outbreaks of contagious disease that can spread quickly throughout regions where farms are clustered together. For example, the previously mentioned devastating outbreak of ISA in Chile in 2007 had resulted in the firing of nearly 7,500 workers by the end of 2008, and the salmon industry workers’ labor union in Chile estimates that as many as 17,000 workers lost their jobs over the full course of the crisis.

In Canada, biologist and anti-farmed-salmon activist Alexandra Morton organized a 500-kilometer walk through British Columbia to raise awareness about decimated wild salmon stocks and rising evidence that sea lice is harming wild populations. Her awareness-raising event culminated in a march of nearly 1,000 people in the province’s capital of Victoria, protesting the presence of salmon farms in the region.<sup>18</sup>

Consumer opposition, as well as increased awareness by the general public of the environmental and human health risks of farmed salmon, has led at least one major retailer to stop selling it. Target announced in January of 2010 that they would no longer be carrying farmed salmon in their stores; they now carry wild-caught Alaskan salmon instead.<sup>19</sup>

## Salmon Labeling

### “Organic” or “certified sustainable” salmon?

Consumers may find salmon products in supermarkets and restaurants that are labeled “organic” by private entities based in other countries, but this is not the same as U.S. organic standards. In some states, like California and Georgia, it is illegal to sell fish labeled as organic based on foreign standards. In the United States, organic standards for seafood do not yet exist, and establishing such a standard through the U.S. Department of Agriculture (USDA) has been extremely controversial. Watch out for this kind of labeling on farmed salmon, as it is often misleading.

*Most farmed Atlantic salmon are imported; however, the United States inspects less than 2 percent of the seafood that crosses its borders, so there is very little regulatory assurance that imported seafood is safe.*

Similarly, if a supplier of salmon makes claims about a product being “certified sustainable,” it’s important to learn about how the standards for such a label are defined. For example, draft standards for farmed salmon have been produced by the Aquaculture Dialogues, but at this point, do not adequately address the serious environmental consequences that can result from open-water farming, or the problems with high levels of wild fish in the diet of farmed salmon.

### Imported seafood?

Most farmed Atlantic salmon are imported into the United States; Norway and Chile produce almost two-thirds of farmed salmon worldwide.<sup>20</sup> However, the United States inspects less than 2 percent of the seafood that crosses its borders, so there is very little regulatory assurance that imported seafood is safe. Check labels to ensure that you are selecting a U.S.-caught wild salmon product.

## Wild-Caught Alaskan Salmon

Wild Alaskan salmon fisheries are well-managed, and the fish are not exposed to the levels of chemicals that are often used on farmed salmon. Chinook, chum, coho, pink and sockeye salmon are all varieties of salmon that are wild-caught in Alaska. While West Coast Pacific salmon are very important to coastal communities, many regions have been devastated in recent years by the effects of climate change and by poor water management — namely the operation of dams and water diversions. Supporting sustainable water usage among agricultural and urban areas will help these populations recover.

Choose cleaner, safer, more sustainable seafood for your own health and the health of our environment. Know your fish, and when it comes to salmon, go wild.



Photo by Robbie Owen-Wahl/Stock.Xchng.

## Endnotes

- 1 Hites, Ronald et al. "Global assessment of organic contaminants in farmed salmon." *Science*, vol. 303, January 2009 at 228.
- 2 Ibid.
- 3 Environmental Protection Agency. "Health effects of PCBs." Undated. Available at: [www.epa.gov/osw/hazard/tsd/pcbs/pubs/effects.htm](http://www.epa.gov/osw/hazard/tsd/pcbs/pubs/effects.htm) and The Interagency Working Group on dioxins, "Questions and answers about dioxins." Updated May 2010. Available at: [www.fda.gov/Food/FoodSafety/FoodContaminantsAdulteration/ChemicalContaminants/DioxinsPCBs/ucm077524.htm](http://www.fda.gov/Food/FoodSafety/FoodContaminantsAdulteration/ChemicalContaminants/DioxinsPCBs/ucm077524.htm)
- 4 "Pièces à Conviction: Assiette tous risques," France 3 Television. Aired June 28, 2010. Translated by Food & Water Watch staff. Available at <http://programmes.france3.fr/pièces-a-conviction/>
- 5 Langman, Jimmy. "'Atlantic salmon' a fish tale: Chilean industry criticized for pollution, sneaky labeling." *San Francisco Chronicle*, April 1, 2002.
- 6 Goldberg, Rebecca J. et al. "Marine aquaculture in the United States: Environmental impacts and policy options." Prepared for the Pew Oceans Commission, Arlington, Virginia, 2001 at 13.
- 7 Islam, Md. Shahidul. "Nitrogen and phosphorus budget in coastal and marine cage aquaculture and impacts of effluent loading on ecosystem: review and analysis towards model development." *Marine Pollution Bulletin*, 50,1: 48- 61, January 2005; and "Technical development document for the final effluent guidelines and new source performance standards for the concentrated aquatic animal production point source category." Engineering and Analysis Division, Office of Science and Technology, U.S. Environmental Protection Agency, Washington, DC, August 2004. [http://water.epa.gov/scitech/wastetech/guide/aquaculture/tdd\\_index.cfm](http://water.epa.gov/scitech/wastetech/guide/aquaculture/tdd_index.cfm)
- 8 Sellner, Kevin G. et al. "Harmful algal blooms: causes, impacts and detection." *Journal of Industrial and Microbiological Biotechnology* 30, 2003 at 385-6; and Cabello, Felipe. "Heavy use of prophylactic antibiotics in aquaculture." *Environmental Microbiology* 8.7, January 2006 at 1140.
- 9 Cabello, "Heavy use of prophylactic antibiotics," 1140-1141.
- 10 Haya, K. et al. "Environmental impact of chemical wastes produced by the salmon aquaculture industry." *ICES Journal of Marine Sciences*, vol. 58, 2001 at 492-496.
- 11 Food and Agriculture Organization. "State of the World Fisheries and Aquaculture 2008" at 145.
- 12 Hansen, L.P. and A.F. Youngson. "Dispersal of large farmed Atlantic salmon, *Salmo salar*, from simulated escapes at fish farms in Norway and Scotland." *Fisheries Management and Ecology* 17, 2010 at 30-31.
- 13 Naylor, Rosamond et al. "Fugitive salmon: Assessing the Risks of Escaped Fish from net-pen aquaculture." *Bioscience*, vol.55, iss. May 2005 at 429-431.
- 14 "Sustainable Marine Aquaculture: Fulfilling the promise; managing the risks." Report of the Marine Aquaculture Task Force, Takoma Park, MD, at 3, 9, January 2007.
- 15 Krkosek, Martin et al. "Declining wild salmon populations in relation to parasites from farm salmon." *Science*, vol. 318, iss. 5857 at 1772-1775.
- 16 Witte, Benjamin. "New stats reveal scope of Chile's ISA outbreak." *The Patagonia Times*, August 13, 2007.
- 17 "Chile's ISA outbreak originated in Norway." *SeafoodSourceNews*, July 21, 2009. Available at <http://www.seafoodsource.com/newsarticle/detail.aspx?id=4294967755>
- 18 Derosa, Katie and Judith Lavoie. "500-kilometer walk protests salmon farms." *The Vancouver Sun*, May 10, 2010. Available at <http://www.vancouversun.com/technology/kilometre+walk+protests+salmon+farms/3008122/story.html>
- 19 Target Corporation. "Target eliminates farmed salmon from all Target stores." January 26, 2010. <http://pressroom.target.com/pr/news/consumables/label/target-eliminates-farmed-salmon.aspx>
- 20 FAO. "State of the World Fisheries and Aquaculture 2008" at 6.

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