

# Factory Farming Contaminates Water in More Ways Than One

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May 06, 2024

## STORY AT-A-GLANCE

- › Drug-resistant bacteria is a result of antibiotic overuse, especially in livestock. An investigation reveals antibiotic-resistant genes are being spread across the globe via animal feed, especially fishmeal
- › A Wisconsin resident contracted MRSA from her well water, which turned out to be contaminated with MRSA-infected cow manure
- › On August 20, 2017, Cooke Aquaculture suffered a structural collapse leading to the release of hundreds of thousands of farmed Atlantic salmon into the Pacific, triggering a state of emergency declaration for Lummi Nation

***Editor's Note: This article is a reprint. It was originally published September 12, 2017.***

Water pollution is a growing problem, and nonorganic farming activities — both on land and in water — are significant contributors. In addition to farming chemicals such as nitrates, which pose a serious threat to water quality, there's the issue of drug-resistant bacteria. As reported by the Center for Public Integrity,<sup>1</sup> water testing in Kewaunee County, Wisconsin, has revealed coliform bacteria "at levels too dangerous to drink."

Drug-resistant bacteria are a direct result of antibiotic overuse, especially in livestock, and recent investigations reveal antibiotic-resistant genes are being spread across the globe via animal feed — especially feed made from fish meal. Turns out aquaculture,

which has been touted as a sustainable alternative to overfishing, is just as environmentally devastating as land-based farms.

The answer to these serious and interconnected dilemmas is to transition over to regenerative and **biodynamic farming**, both of which go above and beyond organic methods.

We also need to come up with more sustainable solutions for fish, as fish farms are turning out to be no less of an environmental nightmare than land-based **factory farms**. The escape of hundreds of thousands of non-native Atlantic salmon into the Pacific, which occurred in August 2017, is a testament to the environmental harm aquafarms do.

## **Drug-Resistant Bacteria Contaminate Many Water Sources**

Coliform are bacteria present in the digestive tracts of animals and humans and are a sign of fecal contamination. Casco, Wisconsin, resident Lynda Cochart contracted methicillin-resistant *Staphylococcus aureus* (MRSA) from her well water, which turned out to be contaminated with MRSA-infected cow manure. Cochart's home well is situated between two dairy farms that house over 1,000 cows each.

U.S. Department of Agriculture microbiologist Mark Borchardt, who conducted the water testing, told Cochart that, "What I found in your well is what I expect to find in a Third World country."

Not only was she told to stop drinking the water immediately, she was also told to "keep your eyes closed and mouth shut" when showering – hardly a foolproof way to avoid further contamination from MRSA-infested water, considering all it needs to enter your system is a small cut or scrape. Similar contamination problems are occurring all across the U.S. According to the Center for Public Integrity:<sup>2</sup>

*"The News21 analysis shows that the drinking water of millions of Americans living in or near farming communities across the country is contaminated by dangerous amounts of nitrates and coliform bacteria from fertilizer and manure*

*widely used in agriculture. Community water systems serving over 2 million people across the country were cited for excessive nitrate levels.*

*While the 5,050 nitrate violations can largely be traced back to agricultural activity, the 22,971 total coliform violations could be from either human or animal feces. However, in heavily farmed areas, much of the coliform bacteria can be attributed to manure. Those records don't cover the millions of private wells that many Americans use, which are left vulnerable to pollution of shallow groundwater in agricultural areas."*

Part of the problem is that farming is exempt from the Clean Water Act. Farms registered as **concentrated animal feeding operations** (CAFOs) are supposed to be regulated under the Act, but many apparently fail to apply for discharge permits. According to the featured article, between 2011 and 2016 the number of CAFOs increased by 956 to a total of 19,496 in the United States, yet the number of discharge permits held by CAFOs declined by 1,806 in that same five-year period.

## **Antibiotic-Resistant Bacteria Spread Around the World via Animal Feed**

Manure is not the only source of drug-resistant pathogens. Researchers at Dalian University of Technology in China claim they've traced antibiotic-resistant genes to animal feed, specifically fishmeal, meat-and-bone meal and chicken meal.<sup>3,4</sup> According to these scientists, fishmeal accelerates the emergence of drug-resistant bacteria and serves as "a vehicle to promote antibiotic-resistant gene dissemination internationally."<sup>5</sup>

A large portion of the meal fed to farmed fish settles on the ocean floor, thereby contaminating the sediment and anything that might come in contact with it. Fishmeal is also widely used in other ecosystems. It's used in livestock feed and as organic fertilizer for example.

For these reasons, "the residual fishmeal in related ecosystems deserves more attention with respect to its impact on the bacteria resistome, even in the absence of prophylactic

or therapeutic antibiotic use," the researchers note.

A report<sup>6</sup> commissioned by the British government in 2014 estimates that by 2050, 10 million people may die from **drug-resistant infections** annually unless we halt the development and spread of these superbugs.

That report followed on the heels of the discovery of bacteria resistant to colistin, an antibiotic of last resort. The colistin-resistant bacteria were initially identified in the U.K. in December 2015, and it wasn't long before the bacteria were found in other parts of Europe, Africa, China and the U.S.<sup>7</sup> as well.

For years, researchers have warned that **use of antibiotics in agriculture** promotes drug resistance, yet American farmers have by and large been reluctant to change what many consider an essential part of raising livestock. However, it's important to realize that organic and regenerative farms, where animals are raised on pasture, rarely if ever require antibiotics to keep their animals well.

The need for antibiotics rose in tandem with CAFOs, where animals succumb to disease due to overcrowding, unsanitary conditions and a species inappropriate diet.

## **US Lags Behind Global Community in Eliminating Antibiotics for Growth Promotion**

According to a survey by the World Organization for Animal Health, the U.S. is the primary buyer and user of livestock antibiotics for growth promotion purposes,<sup>8</sup> which the U.S. Centers for Disease Control and Prevention has identified as a leading cause of antibiotic resistance.<sup>9</sup>

In this regard, the U.S. is part of a clear minority. Of the 130 countries surveyed, only 34 allow the use of antibiotics for the purpose of growth promotion. That said, the survey also reveals there's a lot we do not know.

Even though 96 countries do not allow antibiotics for growth promotion purposes, few if any restrictions are placed on the availability of the drugs. So, while illegal, antibiotics

may still be used in these countries for growth promotion. Previous investigations by the World Health Organization also suggest 80% of low- and middle-income countries do in fact use antibiotics for this purpose.<sup>10</sup>

## **Farmed Salmon Escape Triggers State of Emergency**

On August 20, 2017, something the aquaculture industry said would never happen happened – again – and turned out to be of grave concern indeed. Cooke Aquaculture (which raises Atlantic salmon on San Juan Islands, near Puget Sound in Washington) suffered a structural collapse leading to the release of more than 300,000 farmed salmon into the Pacific.

The event has triggered a state of emergency declaration for Lummi Nation, the third largest tribe in the state. According to Indian Country Today:<sup>11</sup>

*"State officials announced ... that no new permits would be issued for fish farm operations until the cause of the incident was determined. Lummi Nation Fisheries have been catching thousands of Atlantic salmon alongside wild Pacific salmon for several days, but officials still believe many of the invasive fish are already on their way to spawn in local streams and rivers ...*

*'This disaster could have devastating effects and could potentially decimate this year's run of Chinook salmon,' said Lummi Natural Resources Director Merle Jefferson. 'This is unacceptable for all residents of the Puget Sound. We are doing what we can to help limit the damage, but as far as we know, containment is indefinite. These invasive fish are going to find our rivers.'*

By August 28, 2017, tribal fishermen had caught an estimated 200,000 pounds of Atlantic salmon. One particular haul included 50 Atlantic salmon, 800 pounds' worth, and only three King salmon, totaling 20 pounds.<sup>12</sup>

Kurt Beardslee, director of the Wild Fish Conservancy Northwest (WFCN), spoke of the incident as "an environmental disaster," adding, "This dangerous and reckless industry not only threatens the recovery of our native salmon and orca populations but also

threatens the health of Puget Sound and the Northwest's cultural identity." There were also concerns about potential spread of disease, as the escaped salmon had been treated for a deadly bacterial disease.<sup>13</sup>

Under the Clean Water Act, WFCN sued Cooke Aquaculture,<sup>14</sup> and in 2019, days before they were set to appear in court, Cooke Agriculture agreed to settle, and was ordered to pay \$2.75 million for the damages caused by the collapse. In a WFCN press release, Beardslee said:<sup>15</sup>

*"This is truly a victory for the future of our sound. Open water net pen aquaculture is a risky business, and thanks to this settlement we are one step closer to getting this dirty industry out of Puget Sound once and for all."*

## **Nature Is Constantly Blamed for Structural Collapse**

The company blamed the structural collapse on "exceptionally high tide" — an excuse that has many shaking their heads in disbelief. "The thing about tides is that they're just marvelously predictable," Brian Polagye, tidal energy expert and co-director of the Northwest National Marine Renewable Energy Center told Scientific American.<sup>16</sup>

This isn't the first time farmed fish have escaped, and it likely will not be the last, as long as net pens are allowed in open waters. Most other fish escapes have been due to mechanical or human error.

Still, whether the failures were due to natural constants such as tides, technology mishaps or carbon-unit (human) failure, the fact remains that these kinds of mistakes and accidents can have devastating, perhaps even irreparable, consequences. The question then becomes, should fish farms really be allowed to operate in these environmentally sensitive areas?

What's worse, the timing of the escape is particularly troubling as baby chinooks were starting to migrate out of the river. Adult farmed Atlantic salmon weigh two to three times that of younger Pacific salmon, and since they're carnivorous, they could pose a

clear threat to the native salmon population. There are also a number of unknowns, since Atlantic and Pacific salmon do not mingle naturally.

Casey Ruff, natural resource manager for northwest Washington's Swinomish Indian Tribal Community and Sauk-Suiattle Indian Tribe, told Scientific American it's unclear "whether the adult fish are actually able to successfully spawn, interbreed with wild fish, how they compete, whether they eat similar food as the native salmon, as well as whether they actually prey on juvenile salmon. That's definitely a concern."

As noted by Scientific American,<sup>17</sup> "The native salmon's fate is essential for the Lummi, who ... have fought in court time and again for their treaty right to fish for salmon. 'Salmon and culture are the same thing,' [Lummi tribe's member and commercial fisher Ellie] Kinley says. 'Without salmon, we have no culture.'"

## **Factory Farming Pollutes Water in Many Different Ways**

As you can see, farming, both land-based CAFOs and the "CAFOs of the sea," i.e., fish farms, pollute our waters in more ways than one. Chemical runoff is causing toxic algae blooms and poisoning drinking water with nitrates; manure is contaminating water with antibiotic-resistant disease, and fish, meat and bone meal made from animals fed antibiotics spread via ocean sediment and around the world as the feed is shipped to and fro and fed to a variety of animal species.

Then there's the "pollution" of waterways with escaped non-native fish species that could potentially decimate native species. The question is, what can you do?

When it comes to potable water, I strongly recommend filtering the water that comes into your home. If you're on a well, don't make the mistake of assuming you have great water quality, especially if you live near any kind of agricultural or chemical facility. It may be a good idea to get your water tested to find out what you're dealing with.

For example, many areas have glyphosate-contaminated water, and the only way to determine this is through testing. This applies whether you're on well or municipal water. The glyphosate water test kit sold in my online store, developed by the Health Research

Institute (HRI), will contribute valuable information to help HRI understand the extent of glyphosate exposure and contamination.

As for combating the harms done by fish farms, the obvious solution, as an individual, is to stop buying farmed fish. If there's no market for farmed fish, they'll soon fade away. Tests have repeatedly shown that farmed fish are inferior in terms of nutrition and contain more contaminants than wild fish. Just like land-based CAFOs, farmed fish are fed a species-inappropriate diet and do not get adequate space to exercise and move about, which leads to disease.

Subsequently, farmed fish are routinely fed drugs, including antibiotics. Considering the risks associated with drug-resistant infections, it's really important to avoid any and all unnecessary exposure to antimicrobials, and that includes meat and fish from animals treated with antibiotics.

When buying meat, look for meat certified grass fed by the [American Grassfed Association](#). When buying fish, make sure it's wild-caught. Be aware that fish fraud is commonplace, so it's worth doing your homework if you eat fish on a regular basis. In his book, "Real Food/Fake Food," Larry Olmsted, an investigative journalist and food critic, discusses this and provides suggestions for making sure you're getting the real deal.

## Sources and References

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- <sup>3</sup> [Environmental Science and Technology August 30, 2017, DOI: 10.1021/acs.est.7b02875](#)
- <sup>4</sup> [Invisiverse.com August 30, 2017](#)
- <sup>5</sup> [Independent August 30, 2017](#)
- <sup>6</sup> [The Review on Antimicrobial Resistance, December 2014, page 6](#)
- <sup>7</sup> [Science Daily, July 11, 2016](#)
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- <sup>9</sup> [Wired.com September 17, 2013](#)
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- <sup>14</sup> [Wild Fish Conservancy v. Cooke Aquaculture Pac., LLC](#)
- <sup>15</sup> [Wild Fish Conservancy press release November 27, 2019](#)