

CHEFS COLLABORATIVE SUSTAINABLE FOOD REPORT

# The straight answer when buying salmon? It's complicated.

"This river is remarkably clear and crowded with salmon," wrote William Clark in 1805, as the Lewis and Clark expedition reached the Columbia River. "I observe in ascending great numbers of salmon dead on the shores, floating on the water, and in the bottoms which can be seen at a depth of 20 feet." Clark was describing the annual salmon run in the Columbia River, during which the salmon swim upriver to spawn and then die, nourishing the stream for their young.

Today, more than 200 years since observed by Lewis and Clark, the Columbia River salmon run has diminished to 3% of its original volume. Once-bountiful salmon runs have become, in many rivers, a thing of the past due to overfishing, pollution, damming of rivers, and other habitat threats.

In 2011, more than half of salmon eaten in the US comes from aquaculture, the rearing of fish in man made facilities. Many of the world's wild salmon populations, most notably that of the Atlantic salmon, are on life support and commercially unavailable. The Atlantic salmon, however, thrives in aquaculture, where more than 99% of the species resides.

In this paper, we'll help you navigate some key issues related to sourcing salmon. We'll help you know what questions to ask to source the freshest, healthiest, and most responsibly caught (or raised) salmon out there. We'll look at how chefs can best support salmon conservation while offering diners high-quality specimens of this luxurious fish.

## Ask the questions

### WHERE WAS THE SALMON RAISED OR CAUGHT?

Salmon can be wild or farm-raised; it can come from the Atlantic or Pacific; it can come from both hemispheres, though it's native to the northern. It's important to know where your salmon comes from, and how it was raised or caught. These factors affect the price, taste, and sustainability of salmon.



### Season and Frozen at Sea

Salmon is mostly caught from mid-April to late-October. Individual state resource management agencies determine the fishing season and the number of salmon that can be caught. Their goal: to allow fishermen to operate, but in a way that ensures the salmon run will be strong for years to come. This often means curbing the year's catch, or, if a species is struggling, canceling the season entirely (as happened with king salmon in 2009).

Even so, fresh salmon can be had out of season for a price. Frozen at Sea (FAS) salmon is an affordable and tasty alternative. "Truth be told," says chef Bryan Szeliga, "The best way to get quality salmon is to ask for Frozen at Sea."

As with fresh salmon, know from whom you're getting your FAS salmon. You'll be serving the best tasting and most sustainable salmon only if you talk to your purveyors and, where possible, the fishery from which the salmon is sourced. Chef Greg Higgins buys FAS salmon from the same fisheries that supply his fresh salmon. "We only source salmon through folks we know—in most cases they're fisheries and boats that I've been out on."

In the U.S., wild salmon are mostly fished from Alaska and the Pacific Northwest. In general, “wild salmon have a far more complex, clean, and pleasing taste and aroma than farm-raised fish,” says Greg Higgins, chef of Higgins Restaurant & Bar in Portland, Oregon. “Their texture is also firmer and more resilient since they’ve lived a more active life.”

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It’s hard to generalize when describing wild salmon, however. Texture and flavor vary depending on salmon species, their oil content, which river the fish was from, what gear type was used to catch it, and how it was handled afterward.

By far, most of our wild salmon comes from Alaska, which, Mark Tupper of Triad Fisheries points out, has a sustainability clause written into its constitution. Many world renowned varieties of salmon come from Alaska, such as Copper River kings, Yukon River kings, and Bristol Bay sockeye. “Alaska is doing everything it can to be America’s sustainable seafood provider,” says Tupper. That includes a ban on aquaculture, which protects the state’s commercial salmon catch (worth \$300 million per year).

Although the wild salmon catch in the Pacific Northwest is far smaller, salmon plays a leading role in the region’s cuisine. Fishermen from Washington and Oregon receive higher prices for their catches than Alaskan fishermen. (Higgins pays \$5 to \$11 per pound for

whole kings, adding that chefs outside of the region pay an extra \$2 to \$3 per pound to compensate for shipping.) Salmon comes in low volume from California, where decades of coastal development and industrial-scale agriculture have diverted water from rivers that salmon depend on to spawn. “Most likely,” says Higgins, “chefs outside of the Pacific Northwest will see Alaskan fish.”

## **Understanding farm-raised**

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Salmon aquaculture is booming but many question its effect on marine ecosystems and the quality of the salmon it produces. Critics underline three main concerns with salmon aquaculture:

- **Disease and parasites:** Salmon is prone to sickness when crowded into net-pens, and antibiotics are often used to treat disease—which may result in antibiotic resistance in people who eat the farmed fish. Sea lice, a parasite that attaches itself to salmon for survival, originates in the open ocean. But when lice find their way to densely packed farms, they proliferate, and can then get passed back in greater numbers to salmon in the wild. Sea lice can be deadly to young salmon.
- **Escapes:** Every year, hundreds of thousands of farmed salmon slip their nets. If the escaped salmon are able to establish a self-sustaining population in the ocean, they compete with wild salmon for food and habitat, further threatening the stability of wild stocks.
- **Feed:** The farmed salmon industry relies on fishmeal and fish oil, which are often made from small, wild fish that are common prey species (known as forage fish). And though industry advances have reduced

the amount of forage fish needed to make nutritionally complete fish feed, one critique of salmon aquaculture is the relatively high feed conversion ratio—the amount of feed required to produce a pound of salmon is high relative to other fish, like barramundi, that are more efficient feed converters. For some, the question of where we allocate our protein resources is important: should forage fish be used to feed farmed fish and animals?

Despite its questionable environmental impact, the salmon aquaculture industry is evolving, and has made strides to address criticisms, says Ruth Salmon, director of the Canadian Aquaculture Industry Alliance. “Here in Canada, salmon farmers use an average of less than 20 percent fish meal in their feed,” says Salmon. “This compares to 65% of 10 years ago. Where possible, the alternative feed ingredients are sourced locally.”

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Many conservation-minded chefs feature salmon from Loch Duart, a Scottish farm that uses a number of sound practices, like low stocking density, site rotation (similar to crop rotation on land), and a feeding system that mimics how salmon eat in the wild. There are exciting developments for salmon aquaculture on the horizon, too. Of these, Integrated Multi-Trophic Aquaculture (IMTA) shines the brightest. IMTA, a system

under research, combines salmon (or any fish) with other aquatic species that make use of each other's by-products. For example, salmon can be combined with seaweed (which uses salmon's waste) and shellfish (which uses salmon's waste and filters the system's water). "If we could produce several other products in tandem with salmon," says author Paul Greenberg, "It seems that could offset some of the costs."

If you choose to serve farmed salmon, make sure it was raised responsibly, and ask your purveyor about the concerns listed above. Understand that when you see Atlantic salmon on an order sheet, it is almost always a farmed product. If you're unsure about the farmed salmon your purveyor offers you, discuss some alternatives, like Arctic char—a species, points out Greenberg, with salmon-like flavor and texture, not to mention high disease resistance that makes it a good candidate for intensive, land-based farming.

### Catching up on wild-caught

Wild-caught salmon is not without concerns, either. Portland, Oregon-based chef Brian Szeliga says, "I collaborate with organizations like Trout Unlimited and the Wild Salmon Center as one way of learning about the state of wild salmon." Here are some key issues:

- **Pebble Mine.** In Southwest Alaska, a mining partnership is moving to unearth \$300 billion in metals from a site at the Bristol Bay headwaters. The project, called Pebble Mine, threatens Bristol Bay's pristine salmon runs, which account for 20% of the yearly Alaskan catch. In the past, leach mines similar to Pebble have spilled chemicals into waterways and sent the resident



fish belly-up (most notably, a leach mine in Romania poisoned the Tisza River). If not blocked by the EPA, the mine will begin production in 2016.

- **Genetically modified (GM) salmon.** The FDA is considering the deregulation of Gm salmon, which could soon be coming to a purveyor near you. The GM salmon, called "AquAdvantage" by its parent company and "Frankenfish" by its detractors, took 14 years and \$50 million to develop. The GM fish grows at twice the rate of normal salmon. Questions, however, have been raised about its ecological footprint and whether it's safe to eat. If deregulated, GM salmon would be the first approved-for-eating transgenic animal in the US. The FDA has said that GM salmon will not require labeling as such.
- **Water wars.** How should public water be used? In California, this perennial debate pits agricultural and fishing interests against each other—farmers say they need water

### Additional resources:

#### RECENT REPORTS ON SALMON SUSTAINABILITY

*Vote With Your Fork for Bristol Bay*, by Trout Unlimited.  
[www.visionsunltd.com/TU/BristolBay\\_web.pdf](http://www.visionsunltd.com/TU/BristolBay_web.pdf)

#### RECOMMENDED WEBSITES

**Atlantic Salmon Federation**  
[www.asf.ca](http://www.asf.ca)

**Salmon Nation**  
[www.salmonnation.com](http://www.salmonnation.com)

**Salmon Safe**  
[salmonsafe.org](http://salmonsafe.org)

**Save Our Wild Salmon**  
[wildsalmon.org](http://wildsalmon.org)

**Trout Unlimited**  
[www.tu.org](http://www.tu.org)

**Wild Salmon Center**  
[www.wildsalmoncenter.org](http://www.wildsalmoncenter.org)



from rivers like the Klamath and the Sacramento for crop irrigation; fishermen say the salmon need the river water to spawn. As more water has been diverted to farming, it's correlated with drastic declines in salmon populations—and even the closure of the commercial salmon seasons in 2008 and 2009.

These issues are not the only ones in the complex world of salmon fisheries and conservation. Chefs and buyers can be influential advocates for salmon conservation. If you stay abreast of the issues and act with them in mind when sourcing salmon, populations will have a better chance of rebounding. Remember where you stand when speaking with your purveyor.

## Pricing and sourcing

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“Pricing is a difficult topic,” says Szeliga. “There are so many variables: fresh, frozen, frozen at sea, head on, head off, fillet, species, geography.” Expect prices to vary, but one thing to remain constant: salmon is expensive. Generally, Pacific Northwestern salmon costs more than Alaskan salmon which costs more than farm-raised salmon. This order, however, could be upended by the climbing price of gasoline, which purveyor Tupper predicts will disadvantage salmon shipped into kitchens from afar.

To get the highest possible quality, develop a close relationship with your purveyors, says seafood expert Jon Rowley. Ask questions about the quality of the fish. “If possible, take a trip to the rig,” says chef Wayne Johnson of Andaluca at the Mayflower Hotel in Seattle.

Find out about the relationships your purveyor has with the people supplying your salmon. If they deliver salmon that doesn't meet your standards, tell them why. Rowley says, “the quality of fish coming into a restaurant depends directly on how much the chef knows about buying fish, and the relationship chefs have with their purveyor.”

## Determining quality

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Talk to your purveyor about how your salmon is handled. Rowley adds, “How a fish is caught and handled during its first three hours out of the water determines its eating qualities.” Salmon should be bled, dressed and iced before rigor mortis sets in and toughens the flesh. Taste and texture suffer when fish go through rigor out of refrigeration.

Unlike other fish, salmon eyes, small and dense, don't change much with age, they're not a reliable freshness indicator. Rowley also notes the importance of the salmon's scales. “They're the best indicator of freshness and handling;” along with an aspic-like coat of slime, manufactured during rigor mortis. As salmon's time out of water increases, scales (and quality) drop off. If the fish has a full coat of scales, it has been handled perfectly. And salmon perfectly handled—from ocean to kitchen to table—benefits all parties involved, including the fish.

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Chefs Collaborative works with chefs and the greater food community to celebrate local foods and foster a more sustainable food supply. The Collaborative inspires action by translating information about our food into tools for making sustainable purchasing decisions. Through these actions, our members embrace seasonality, preserve diversity and traditional practices, and support local economies.