We've all been there. You're in the supermarket freezer aisle trying to make sense of the different labels on seafood products. You know the oceans are in trouble and you're trying to do the right thing, but the information is confusing and seemingly contradictory.

One packet of salmon filets has a smiling dolphin logo on the back.
Another, a less-smiley bright blue fish logo. You pull out your smartphone and open the sustainable seafood app your friend told you about, only to become more confused by its traffic light ratings. In the end, you just pick any product that the label assures you is sustainable.

**Making sense of salmon sustainability**

Salmon is one of the most consumed seafoods globally. It's a rich source of protein, key micronutrients and fatty acids. But with so many different products on the shelf, it's hard to know which ones harm the environment and fish stocks the most.

Both wild-caught and farmed salmon can be sustainable, but determining the environmental impact of a filet isn't simple. Both can present significant social and environmental problems. Wild-caught salmon can be overfished or sourced from vulnerable fish populations. But while salmon aquaculture can reduce the pressure on wild stocks, it's no panacea.

Farmed salmon producers often face scrutiny for overcrowding, parasites and pollution, with escapees from open-net pens feared to endanger local wild populations. The fish meal used to feed farmed salmon presents further problems, as it often originates from wild-caught fish that aren't always taken at sustainable levels.

These challenges are expected to be exacerbated by shifting climates: higher water temperatures and reduced rainfall can enable the growth of pathogens, and increase the susceptibility of fish populations to disease.

Many certification schemes, eco-labels, rankings and guides exist to signpost salmon sustainability. For wild-caught salmon, the Marine Stewardship Council provides the gold standard, assuring that it has been sourced from fisheries managed according to rigorous environmental
standards. For farmed salmon, a tick of approval from the Aquaculture Stewardship Council is considered the most thorough certification, indicating responsible aquaculture practices.

One of us (Laurence Wainwright) has researched eco-labels for five years, finding that these two certification schemes are currently the most scientifically sound, evidenced-based standards for seafood sustainability—including salmon.

Other seafood sustainability schemes offer some assurances of sustainability, but are often not nearly as rigorous. Schemes for farmed salmon such as the Soil Association's organic standard have recently faced criticism for having standards that are perceived by some as not going far enough—or potentially even misleading customers by certifying some Scottish salmon farms as organic.

To a consumer, an "organic" label generally signifies that a product has been grown from organic feed and produced without the use of chemical pesticides or antibiotics. Farmed salmon can be organic, if raised and fed correctly.

A Soil Association spokesperson stated: "Organic farms must follow strict rules to minimize impacts on the environment and animal welfare, and when problems occur, they must prove they are taking action in order to use the organic logo." The Soil Association's aquaculture standards are currently under review following a 60-day consultation, and an update to its standards is due later in 2024.

According to fish conservation charity WildFish, some badges of sustainability in salmon aquaculture can mask details of unregulated salmon supply chains—with certifications rarely being lost even when conditions are breached. According to its 2023 report, some UK farms have been permitted to use wild-caught fish for feed and to use toxic
chemicals for parasite control, without losing their organic certification. This is controversial: such ambiguity and lack of transparency only hinders the salmon aquaculture industry.

In terms of wild-caught salmon, it is our strong opinion that it is never legitimate, under any circumstances, to call it organic. Not only is this misleading but it defies scientific evidence and undermines the meaning of the term organic.

Which salmon should you buy?

When buying salmon or ordering it at a restaurant, look for key information on the labels or ask staff about the sourcing of their fish.

- How, and from where, was it caught or farmed? Either can be sustainable, but the devil is in the detail.
- If farmed, what was it fed—and from where did this feed originate? The feed should be from a sustainable source of fish, and perhaps even certified itself.
- If wild-caught, is there minimal by-catch associated with it?
- Which species of salmon is it? Whether Atlantic, chinook, sockeye, pink, coho or chum, sustainability depends on a variety of factors so there is no hard-and-fast rule. But there are better and worse options: this guide from Seafood Watch is very useful.
- Which eco-labels does it have? Certifications from the Marine Stewardship Council and Aquaculture Stewardship Council are best.

The scale of salmon

While it's best to choose locally sourced fish where possible, many salmon-loving populations live far from the hotspots of salmon.
production. Sushi salmon in Japan, for example, may have traveled 17,000 km from Norwegian or Chilean farms. And an estimated 52% of emissions from the production of 1 kilogram of farmed salmon in Norway comes from its air transport to China for consumption.

The need to mitigate the carbon footprint of salmon production will only increase as the world ramps up decarbonization efforts. With an increasing global population, pressure on the already over-exploited wild salmon stocks is set to intensify.

Salmon farming or aquaculture currently bridges this gap between supply and demand, accounting for 70% of the salmon available for consumption. As the fastest-growing food production system, the salmon farming industry is projected to reach a value of US$37 billion (£29 billion) globally by 2027.

We need to fundamentally change our relationship with seafood if we are to preserve this wonderful natural food resource. We don't have to stop eating salmon but we must make smarter decisions, both at the fish counter and within seafood supply chains.

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