

GLOBAL NORTH'S GROWING APPETITE FOR FARMED SALMON IMPERILS COMMUNITIES' ACCESS TO LOCAL FISH

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Farming Atlantic Salmon in Tasmania. Photo by Arthur Chapman, [Flickr](#).

The growing appetite for expensive farmed salmon can leave coastal communities struggling to access affordable local fish like sardines and anchovies, new research published in [Science Advances](#) shows.

The paper, co-authored by researchers with Oceana and the [Sea Around Us](#) initiative at the University of British Columbia's Institute for the Oceans and Fisheries, exposes the global aquaculture sector's growing dependence on wild, small pelagic fishes which are frequently caught, processed, and **'reduced' to fishmeal and fish oil**. Almost the entirety of the production of fishmeal and fish oil, that is, 87 per cent and 74 per cent respectively, is used to feed farmed fish.

These 'reduction fisheries' account for 26 per cent of global ocean catch.

"As the aquaculture industry grows, so does its dependence on wild fish," said Dr. Kathryn Matthews, Oceana's chief scientist and one of the authors of the paper. "The continued rapid expansion of the sector will demand ever more fishmeal and fish oil, even as its use in feed becomes more efficient."

The study, led by Dr. Patricia Majluf, associate professor at the Cayetano Heredia University and former Oceana Peru vice president, debunks the industry's use of the 'Fish-in-Fish-out' (FIFO) ratio – the standard metric used to quantify how much wild fish is used to produce farmed fish. The FIFO ratio is often employed as an indicator of the impact of aquaculture on wild fish stocks.

The FIFO ratio, however, has resulted in **several misleading practices** such as averaging fishmeal and fish oil inputs of carnivores and herbivores together to conceal the high feed requirements of carnivore species. This achieves a lower FIFO ratio, reaffirming the aquaculture industry's claim that its dependence on fish oil and fish meal is decreasing. Fish oil, especially, is a limited commodity increasingly in demand by salmon farms, which now supply 70 per cent of all salmon consumed worldwide. In 2020, farmed Atlantic salmon alone accounted for 60 per cent of fish oil usage, the authors calculated.



Fishmeal and fish oil.
Image by Phu Think Co, [Flickr](#).

"The salmon industry is not a food production system – it's a food reduction system. It benefits the few who can afford it, but reduces access to nutritious fish for those who **need it the most**," said Dr. Matthews.

For example, processing plants in West Africa are exploiting vast amounts of small pelagic fish, mostly sardinella, to produce fishmeal and fish oil for export. "This is an equity issue – it puts local fishmongers at an unfair disadvantage because they cannot compete with the prices the plants are willing to pay for this global commodity," Dr. Daniel Pauly, principal investigator of UBC's [Sea Around Us](#) initiative, said.

The authors noted a turbulent future ahead for fishmeal and fish oil production.

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Climate change is impacting fish populations around the world, including the main source of fishmeal and fish oil – the Peruvian anchoveta. Like many others, this species in warmer waters contains less fish oil. Moreover, continued poor management of these fisheries allows for ever higher catches of juveniles, which also contain less oil, “and this will lead to growth overfishing if continued”, Dr. Maria ‘Deng’ Palomares, project manager of the *Sea Around Us*, said.

Combined, these factors are driving an increase elsewhere around the world in the use of fish usually directly consumed by humans, such as sardines and mackerel, to compensate for the reduced oil production from Peru, said Dr Majluf. For these reasons, the authors urge the industry to operationalize substitutes for fishmeal and especially fish oil in aquaculture fish feeds.

The paper “A review of the global use of fishmeal and fish oil and the Fish In:Fish Out metric” is available in *Science Advances*, doi: [10.1126/sciadv.adn5650](https://doi.org/10.1126/sciadv.adn5650)



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