FISHERIES AND AQUACULTURE

Mind the (supply) gap

The gap between global supply and demand of omega-3 fatty acids is twice previous estimates. Opportunities to narrow that gap include increasing use of fishery by-products and reducing food waste.

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Fish oil was once viewed as low grade, used for industrial lubricant and fuel purposes. Its renaissance as a high-value source of nutrients arose from the recognition of the essentiality of the omega-3 fatty acids, eicosapentaenoic and docosahexaenoic acids (EPA and DHA), to human diets[1] and the diets of other animal and aquaculture species[2]. With the rise of aquaculture, an increasing proportion of the global supply of fish oil and fish meal has been diverted to this burgeoning animal production sector. Although alternative resources for generating omega-3 oils have been investigated, including a growing range of microalgal oils and genetically modified plant oils[3], most omega-3 fatty acids are still sourced from finite marine fisheries and there is a clear, growing gap between supply and demand[4].

In this issue of *Nature Food* Hamilton et al.[5] apply quantitative systems analysis to track the flows of EPA and DHA through global production, supply and utilization pathways. They find the current supply for human consumption is 150 mg per capita per day — about 30% of global demand[5] — and this represents twice the gap in supply previously reported[4]. This surprise finding suggests the supply gap needs more urgent attention than previously thought, and a multifaceted strategy of de novo synthesis and improved reclamation of existing EPA and DHA is needed.

Systems analysis allows Hamilton et al.[5] to identify options for increasing global supply of EPA and DHA through reclamation (increasing fishery by-product utilization) and reducing food waste. To facilitate that reclamation, the authors suggest centralized processing of by-products on a regional basis. They also suggest improvements in fishery management, such as further catch restrictions and gear modifications, to reduce waste. The study highlights the need to access future global long-chain omega-3 from lower trophic levels, such as genetically modified crop and microalgal sources, before losses occur through subsequent trophic cascades.

Notably, Hamilton et al.[5] report that aquaculture is a net contributor to the global EPA and DHA supply-chain. There has been a long-held view that aquaculture was a net consumer of fish resources, and that its contribution to global food supply was thus questionable[6]. These new findings, combined with recent changes in industry practices[7], mean that the prevailing paradigm of aquaculture as a net user of marine resources may be changing. ❐

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Competing interests

The author declares no competing interests.