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Demonstration of salmon farming as a net producer of fish protein and oil

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Abstract

To date aquaculture's reliance on dietary marine sources has been calculated on a fish weight-to-weight basis without considering the absolute amounts of nutrients but this approach neglects the often considerable differences in the nutritional value of fish. We propose simple nutrient-to-nutrient-based dependency measures that take into account these nutritional differences. In the first study reported here, individually tagged Atlantic salmon (*Salmo salar*) were reared in seawater supplied tanks with feed collection facilities. In the second, commercial net pens were used to grow over 200 000 fish. For both studies, a low marine ingredient feed containing approximately 165 g kg⁻¹ fishmeal was compared to a control feed (approx 300 g kg⁻¹ fishmeal) whilst fish oil inclusion was less markedly reduced. The low marine feeds supported similar growth and feed efficiency compared to the control feeds. With the low marine ingredient feeds, the weight of salmon protein and lipid produced through growth exceeded the weight of marine protein and lipid consumed by the fish meaning that salmon farming can be a net producer of fish protein and oil. The amount of n-3 long-chain polyunsaturated fatty acids deposited was sufficient to meet current recommendations from human health organizations.

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