

Algal Oil

 | **Executive Summary**
2025 State of the
Industry Report

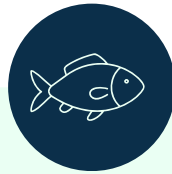
Algal oil is a proven, scalable, and safe feed alternative to fish oil

Aquaculture growth depends on omega-3s, traditionally sourced from fish oil, but limited global supply and rising demand are driving price volatility and pressure on pelagic fisheries. This report assesses algal oil's nutrition, scalability, sustainability, and safety as a substitute for fish oil in aquafeeds.



Proven nutritious and sustainable alternative to fish oil

Algal oil has proven its nutritional equivalence to fish oil, and can deliver up to 30% lower GHG emissions while avoiding marine disruption



Adopted by major feed producers in salmon diets

Leading companies like Skretting, BioMar, Cargill, and Mowi, consistently incorporate algal oil into their feed formulations



Strong growth forecast looking forward

Global production of algae-based EPA and DHA reached 20,000 tonnes in 2025 and is expected to increase by 80% by 2030.

Mainstreaming algal oil in commercial salmon feeds

Algal oil has progressed from pilot stage to routine use in commercial salmon feeds, offering stable, traceable omega-3s with equivalent nutritional performance. Algal oil is competitive during high fish oil prices and proved its commercial viability in the 2023 supply crisis. Ongoing efficiency gains, use of circular feedstocks, and stable offtake agreements will be critical to sustained expansion.

Reduced ecological and social harms

By substituting fish oil derived from wild-caught species, algal oil can alleviate pressure on marine ecosystems and support the recovery of fish stocks. It also avoids the accumulation of marine contaminants such as heavy metals and dioxins, improving feed and food safety across the value chain.

Industry at a Glance: Algal Oil

MARKET VALUE

Global market for EPA + DHA omega-3 ingredients in 2024, USD

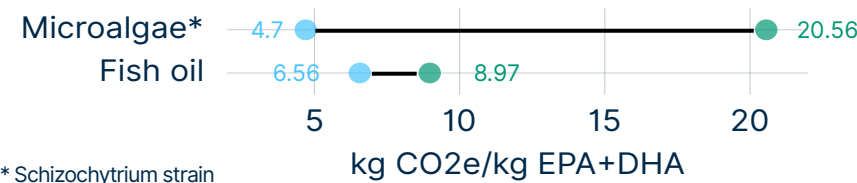
\$2.38 bn

NUTRITION

Viable replacement rate of fish oil in aquafeed formulations

100%

GREENHOUSE GAS EMISSIONS



* Schizochytrium strain

Whilst emissions vary, production can have up to 30% lower lifecycle GHG intensity than fish oil with leading species

PRICE

\$6,000 - \$15,000

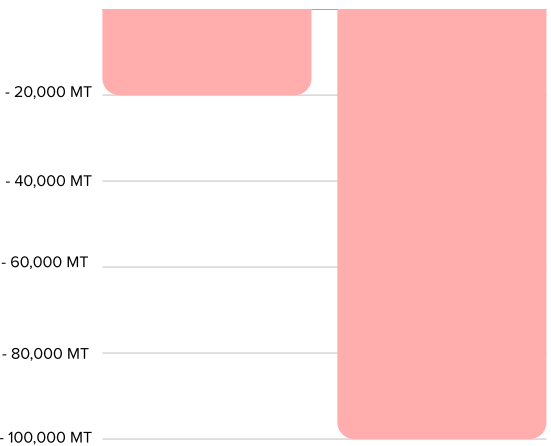
per metric tonne
competitive under high fish-oil prices

ECOSYSTEM BENEFIT

40:1

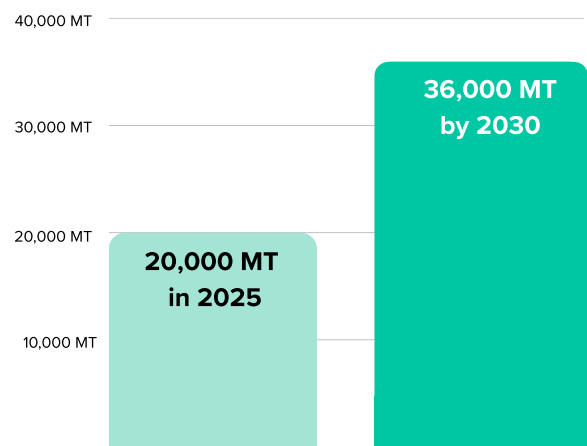
1 tonne of algal oil can replace the DHA obtained from around 40 tonnes of wild-caught fish

GLOBAL FISH OIL SUPPLY & DEFICIT FORECAST



Global fish oil deficit is 20,000 MT in 2025, and is projected to increase to 100,000 MT by 2030

GLOBAL ALGAL EPA + DHA PRODUCTION & FORECAST



Global EPA & DHA output from algal oil is projected to increase from 20,000 MT in 2025 to 36,000 MT by 2030, driven by expanding industrial scale-up.

Assessment: Algal Oil

Traffic-light assessment of algal oil as a replacement for fish oil in aquafeeds.

Nutrition

Nutritional Composition	●	Contains up to 55% total fatty acids as EPA + DHA, comparable to or higher than fish oil.
Health & Performance Outcomes	●	Achieves full (100%) fish-oil replacement with no loss in growth or feed conversion ratio in commercial settings.
Product Quality	●	Produces fillets with no detectable differences in taste, texture, or appearance compared to fish-oil diets.

Scalability

Unit Cost Competitiveness	●	Priced at USD 6,000–15,000/MT, usually higher than fish oil except under tight-supply conditions.
Capital Intensity (CapEx)	●	Requires higher capital investment (USD 90–100k/MT EPA+DHA capacity), improving with modular expansion.
Market Integration	●	Used routinely in salmon feeds, but broader uptake remains limited relative to fish oil due to price cycles.
Scale and Volume Growth Potential	●	Expected to grow from 20,000 MT (2025) to 36,000 MT (2030) EPA + DHA, to meet significant demands.

Sustainability

Climate Change Impact	●	Delivers comparable or lower GHG emissions than fish oil in leading species and production systems.
Land Use	●	Drives greater land use when sugar feedstocks are irrigated, relative to fish oil.
Water Use	●	Exhibits higher water demand, especially in phototrophic systems, relative to fish oil production.

Safety

Regulation	●	Approved & supported in key markets, though regulatory gaps remain in emerging markets.
Food safety	●	Poses significantly lower contaminant and pathogen risk compared to wild-caught fish oil.
Ecological Safety	●	Produced in closed, controlled systems, offering higher ecological safety than marine-sourced fish oil.

● Strong; limited constraints ● Developing; moderate constraints ● Weak; significant constraints

Barriers to adoption

Despite proven technical and nutritional readiness, economic, regulatory, and feedstock constraints limit the larger-scale adoption of algal oil. Most barriers are commercial rather than technological, highlighting the need for long-term market commitments and policy alignment.



- 1. Cost competitiveness:** Prices remain above fish oil except during high fish-oil volatility. The cost gap is narrowing through improved energy efficiency, higher capacity utilisation, and emerging waste-derived feedstocks.
- 2. Capital Intensity:** High upfront investment per tonne of capacity limits new entrants. Broader adoption depends on long-term offtake contracts and modular, lower-cost production models.
- 3. Regulation:** Algal oil is fully approved for aquafeed in the EU and US but faces slower authorisation and restrictions on GMO strains in Asia. Proactive regulatory alignment will accelerate regional expansion.
- 4. Feedstock Dependence:** Dependence on refined sugars limits geography and cost flexibility. Localising production and scaling waste-stream utilisation remain key to improving resilience.

Barriers remain moderate with avenues to overcome through continued innovation and collaboration.

The key challenge is no longer viability but expanding supply and availability. With fish-oil scarcity set to intensify, scaling algal oil in advance of future fish oil scarcity will depend on securing offtake agreements, constructing cost-optimised facilities, as well as increased support from national regulators.

Path forward

CFI recommends that the algal oil industry, the aquaculture sector, regulators, investors, and governments, adopt these steps to accelerate adoption. Collective action from producers, feed companies, and regulators is essential to improve cost competitiveness and accelerate widespread commercial adoption.

Recommendations



**ALGAL OIL
SUPPLIERS**

Integrate renewable energy and industrial by-products to lower per-tonne impacts.



**AQUAFEED
PRODUCERS**

Establish multi-year offtake agreements with algal oil producers to secure predictable supply and secure investment.



INVESTORS

Support the expansion of industrial production and improve biomanufacturing efficiency to achieve economies of scale and improved sustainability.



**POLICY
MAKERS**

Expand regulatory approvals in emerging markets such as Asia, to drive further adoption in new markets.



**CIVIL
SOCIETY**

Educate the public on algal oil's climate, safety and biodiversity benefits, to grow consumer demand.

**Read CFI's 2025 Algal Oil
State of the Industry report
[here](#)**



About CFI

The Centre for Feed Innovation is an independent think tank that is accelerating the development of novel feed ingredients. We provide insights to drive innovation in sustainable, scalable, and safe animal feed ingredients. Support our work here.



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