



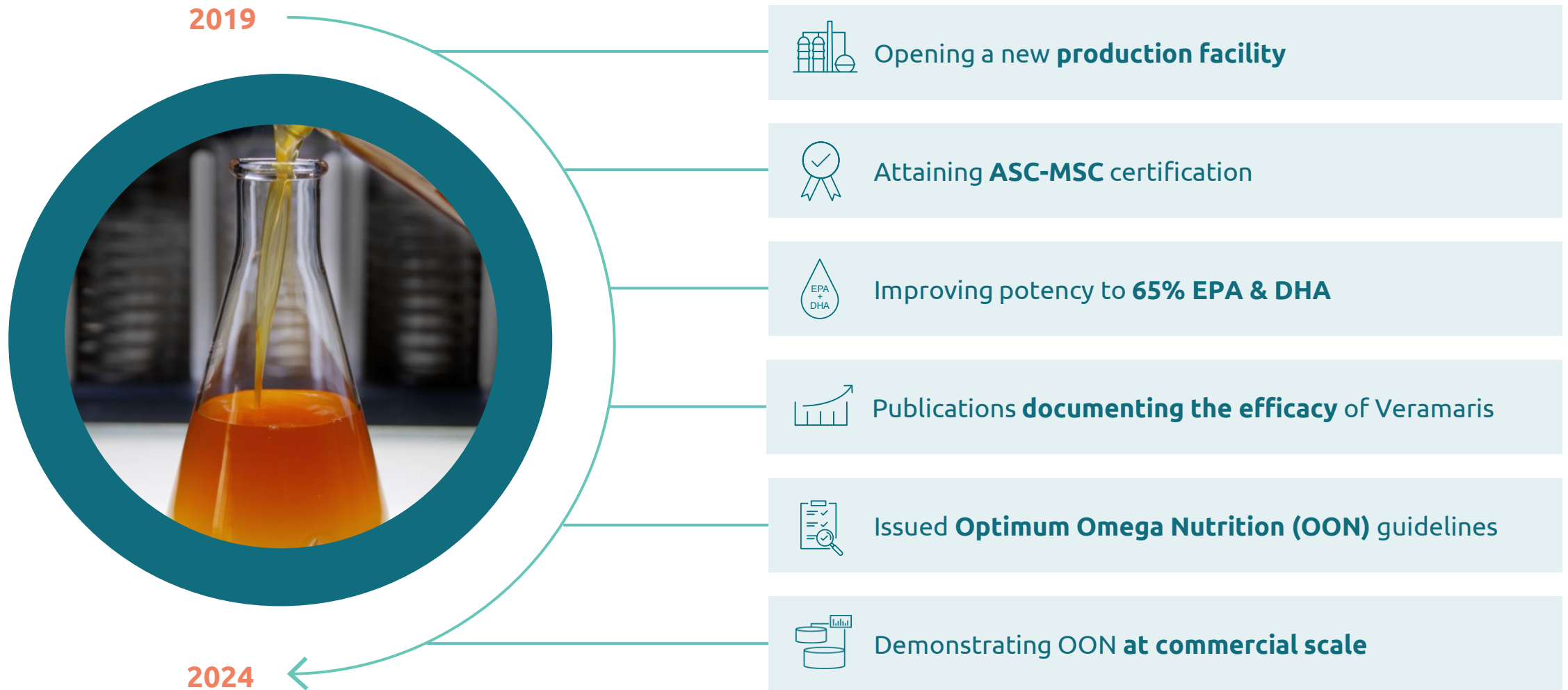
Opportunities for added value with algal Omega-3

AQUASPEECH, 15 March 2024
Jorge Torres



Algal oil gains broad adoption in the industry

A lot was achieved in just 5 years



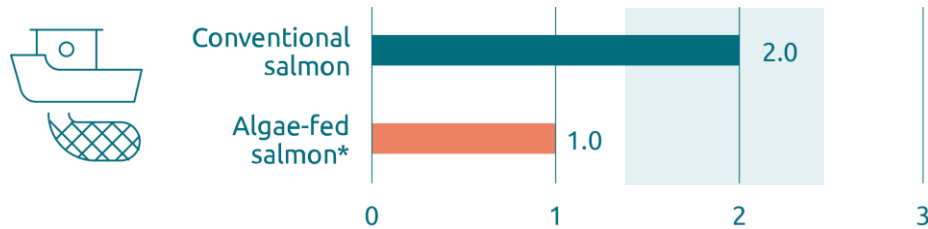
We took actions to decarbonize our operations

Leading to lower emissions along the Value Chain and a more sustainable product for the customers



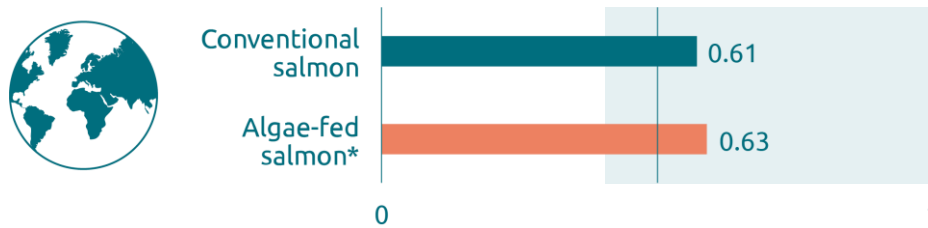
Algal oil helps to lower marine footprint without impairing carbon footprint

Marine footprint FFDRoil



Substantially reduced marine dependency and less impact on marine fisheries

Carbon footprint CO₂e**



No change to the carbon footprint of Norwegian farmed salmon

Based on Veramaris LCA study

*50% replacement of Omega-3 (EPA & DHA) from fish oil with Veramaris algal oil

**Kg of CO₂-eq per 40g edible salmon protein

Light blue shaded area indicates the typical range for Norwegian salmon industry

Discover Veramaris
FFDRoil calculator

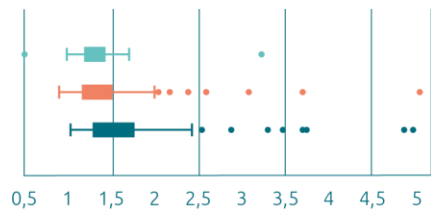


Diets richer in EPA & DHA are better for salmon performance

Big data have highlighted the value of higher EPA & DHA levels in feed

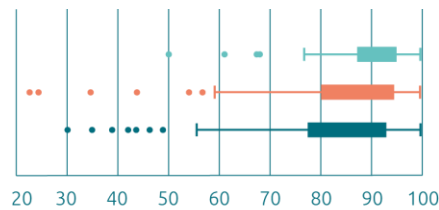
291 generations | 232 600 000 fish | 2 – 8 production zones | 2013 – 2022

Economic Feed Conversion Ratio (eFCR)



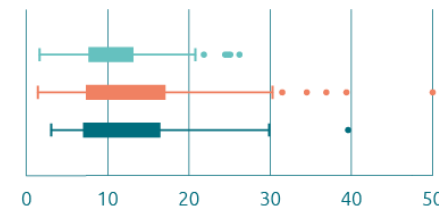
Feed with higher levels of EPA & DHA resulted in an **-11%** decrease in Economic Feed Conversion Ratio (eFCR)

Superior Harvest Percentage [%]



Using above-average levels of EPA & DHA increased farmers' chance of a superior harvest above 90% by **+27%**

Mortality Percentage [%]



Generations with higher levels of EPA & DHA showed **-21%** less variability in the total mortality for the generation

EPA & DHA Category ● Above average > 8% ● Average 7 – 8% ● Below Average < 7%

Learn more!



Next steps for 2024: even more Big Data insights

Expansion to other regions and further down the Value Chain

Phase 2:
Contact us!

More companies to join:

- Chile
- (Further) Norwegian farmers



Photo credits: Blumar

Would you like to extend the production data set and **explore the value of EPA & DHA on salmon productivity?**

Investigate benefits on flesh quality:

- Pigmentation
- Gaping
- Melanosis
- Fillet yields




Would you like to **uncover new insights about the impact of EPA & DHA on flesh quality parameters?**

Higher EPA & DHA is good not only for fish, but also for humans

This is also a prime source for downstream value creation



 Rich in Omega-3

Our salmon is an excellent source of Omega-3, that's why we proudly use the symbol "Ω".

Source: mowisalmon.co.uk



- With a proven increased Omega-3 content
- Use of feed with the inclusion of algal oil
- Particularly rich in EPA & DHA



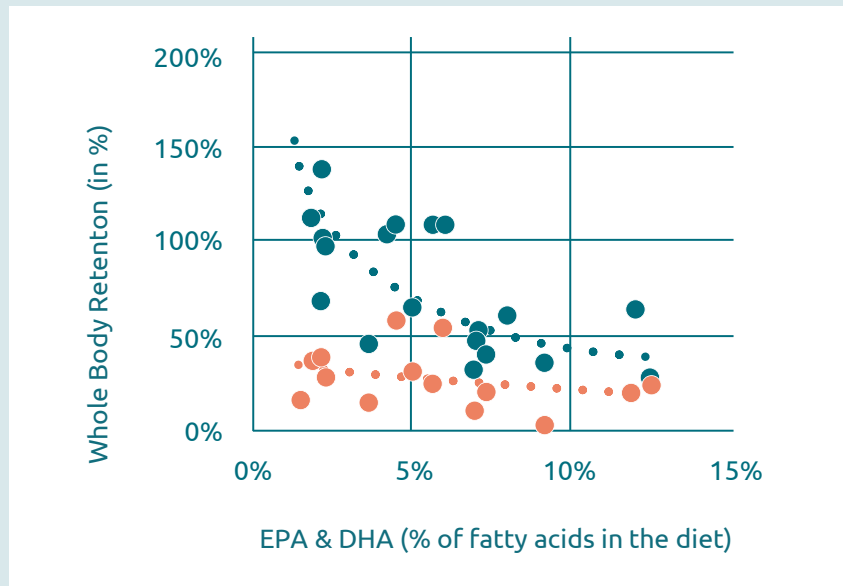
- **2/3 of seafood consumers (69%)** say **nutrition and health** are the primary or a very important reason they eat seafood
- **81%** among frequent seafood consumers

Source: The Power of Seafood 2023, FMI

Salmon shoppers care about Omega-3 levels

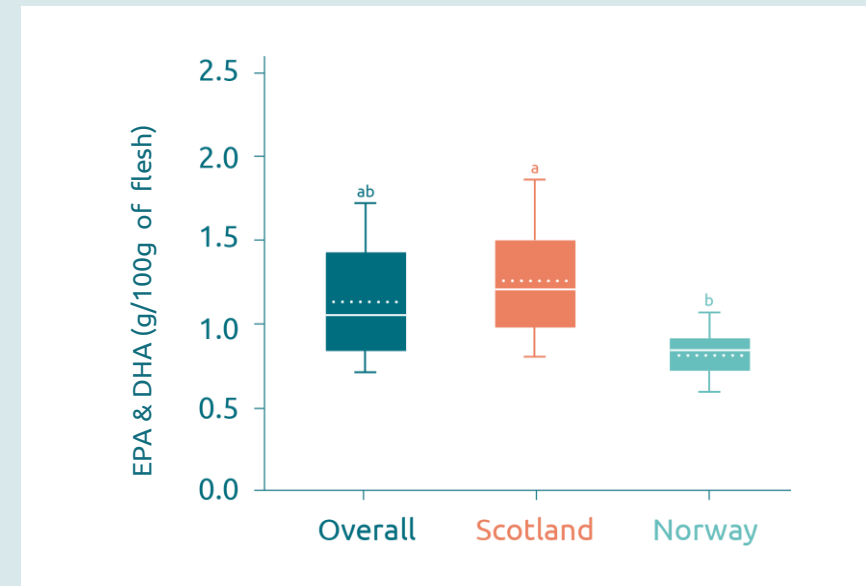
The industry needs to deliver consistent levels to meet consumers' expectations

While deposition of EPA & DHA is predictable ...



Source: Glencross et al., under preparation

... huge variation exists in nutritional quality



Source: Sprague et al, 2020

Breaking news: new service tool

Manage the deposition of EPA & DHA in farmed Atlantic salmon

Launching soon

Get in touch with us
to learn more


How?

- Developed based on **scientific knowledge** about nutrient flow in salmon
- Evaluated using **empirical data from multiple lab and commercial trials**

What?

Allows users to address 2 key questions:

1. What is the expected **EPA & DHA level in the fillet** over time?
2. How much **EPA & DHA** should be included in **the feed** to reach your target in the fillet?

 **VERAMARIS** Fatty acid deposition tool

Insert target and production settings | **Estimates of the required feed EPA & DHA**

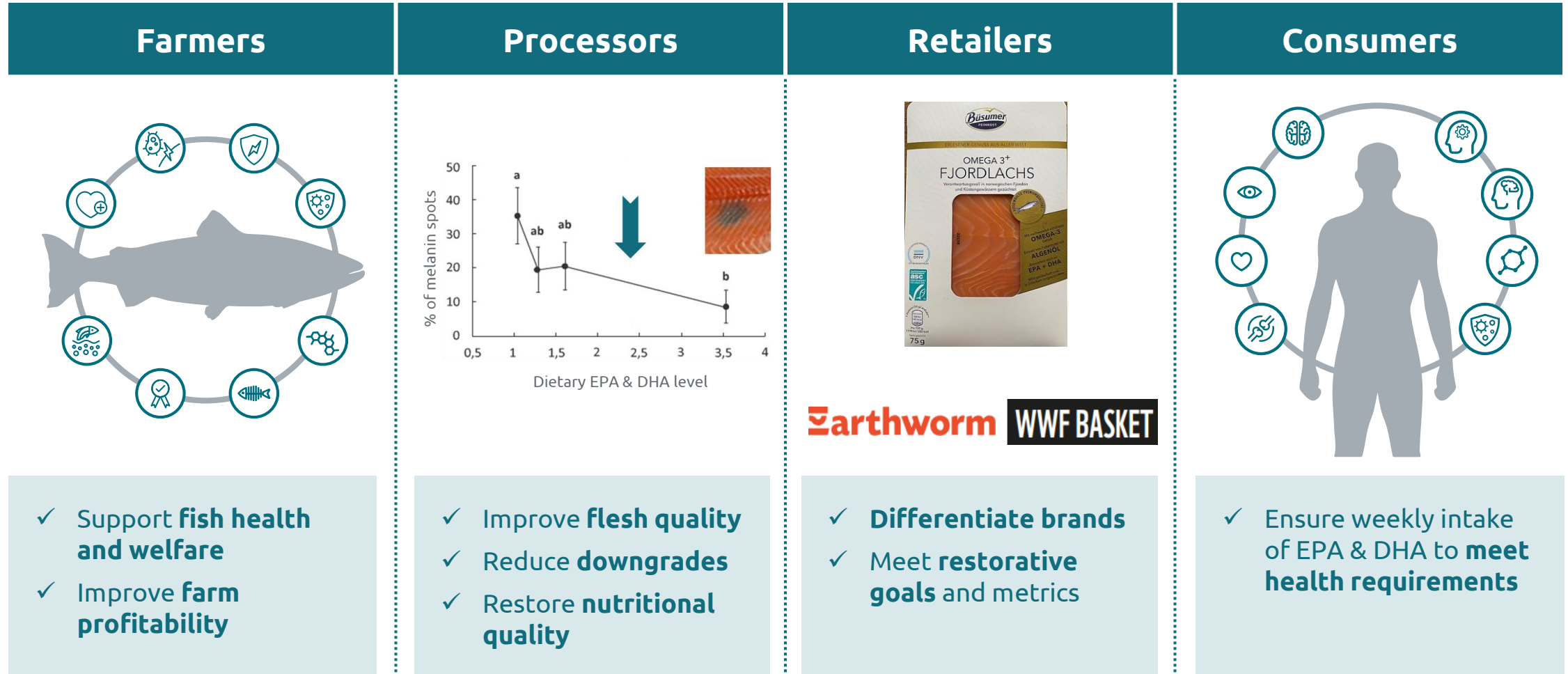
Species	<input type="text" value="Salmon"/>
Target fillet composition	
EPA & DHA (mg/100g fillet)	<input type="text" value="1.5"/>
EPA:DHA ratio	<input type="text" value="0.5"/>
Finishing production settings	
Start date (dd/mm/yyyy)	<input type="text" value="20/2/2024"/>
Finishing period (days)	<input type="text" value="150"/>
Initial fish weight (g)	<input type="text" value="2500"/>
Final fish weight (g)	<input type="text" value="5500"/>
Average temperature (°C)	<input type="text" value="10"/>

Feed 1	% total fatty acids	mg/g as-fed basis
EPA	<input type="text" value="4"/>	<input type="text" value="12"/>
DHA	<input type="text" value="5"/>	<input type="text" value="15"/>
Feed 2	% total fatty acids	mg/g as-fed basis
EPA	<input type="text" value="6"/>	<input type="text" value="18"/>
DHA	<input type="text" value="8"/>	<input type="text" value="24"/>

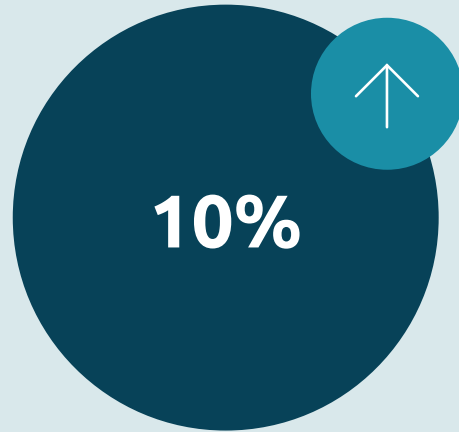
[Export predictions report](#)

Higher EPA & DHA levels matter throughout the Value Chain

Algal Omega-3 help to achieve these without adding pressure on finite marine resources

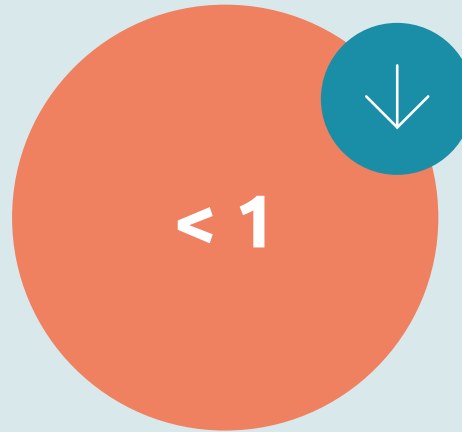


Take-home messages



Increase EPA & DHA to 10% of total fatty acids the feed

- Better fish health, welfare and quality
- Follow Veramaris **Optimum Omega Nutrition** Guidelines



Reduce FFDRoil to < 1

- Reducing dependency on limited forage fish for marine ingredients
- Use Veramaris **FFDR Calculator** to see how Veramaris oil helps



Increase EPA & DHA in the fillet to 1.75g/100g

- Ensuring weekly intake of Omega-3 fatty acids in one portion of salmon
- Use Veramaris **Deposition Model** to predict accurately

Specify

algal oil

to unlock opportunities
for added value