Aquaterra®: Stakeholder Alignment & Coalition Building to Achieve the Impossible

The Vision: A Structural Crisis in the Ocean

The global aquaculture industry was facing an existential supply chain crisis that no amount of efficiency optimization could solve. Global omega-3 demand had reached 650,000 metric tons annually and was continuing to grow at an unprecedented rate. Meanwhile, the ocean's sustainable supply capacity was capped at 530,000 metric tons per year and actively shrinking due to climate and environmental pressures. This created a structural, not cyclical, annual shortfall of 120,000 metric tons of essential nutrients.

120,000 metric tons

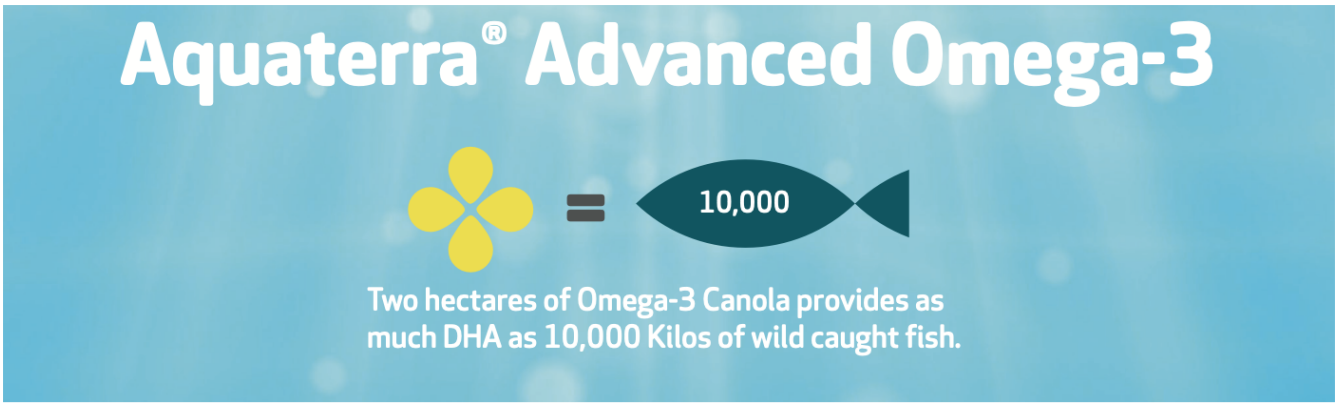
ANNUAL OMEGA-3 SHORTFALL

A structural gap between global demand and sustainable ocean supply

The traditional solution for this deficit—grinding wild-caught forage fish into fish oil and fish meal—was an increasingly unsustainable practice that depleted the very ocean ecosystem that aquaculture depended upon. Without a scalable alternative source of omega-3, the industry faced rising input costs, intense regulatory pressure, and the nutritional degradation of farmed fish. The long-term viability of global aquaculture was at serious risk if a land-based solution could not be found.

Aquaterra®—a canola oil engineered with microalgal genes to produce EPA and DHA at scale—was developed by Nufarm and CSIRO to solve this problem permanently. The scientific breakthrough was astounding: one hectare of Nufarm omega-3 canola produces the equivalent omega-3 content of 10,000 kg of wild-caught fish. The science was proven, and the product was ready for market. However, the true obstacle to bringing this zero-to-one innovation to the world was not scientific, but rather human.

> *“One of the major challenges in aquaculture is the lack of omega-3 in fish feed. Plant-based omega-3 can provide a stable source of these oils to secure the growth of the aquaculture industry.”*
>
> — Bente Ruyter, Senior Scientist, Nofima



Ecological Supply Chain Comparison

Discovery & Ambiguity: Navigating the Regulatory Wall

When I joined Nufarm Nutritional as Global Director of Marketing and Communications in March 2020, I inherited a scientifically validated, commercially promising ingredient facing a massive wall of cultural, regulatory, and institutional resistance. Norway, the world's largest salmon farming nation and the single most important market for Aquaterra®, had a clear and public position: no genetically engineered ingredient would ever be approved for use in Norwegian aquaculture. The ambiguity lay in how to dismantle a national policy rooted in deep cultural skepticism.

Achieving Norwegian regulatory approval required building a coalition across stakeholder groups that had never worked together—and in some cases held actively opposing worldviews. I began by mapping the ecosystem, identifying eight distinct stakeholder groups ranging from local scientific institutions like NOFIMA to global NGOs like the Earthworm Foundation. Each group needed a different message, and each needed to feel that their specific concerns regarding biotechnology and ocean health had been heard, understood, and addressed.

> **Strategic Insight**
>
> Stakeholders with fundamentally opposing worldviews can be aligned if you identify a single, undeniable shared imperative—in this case, the fact that the ocean is running out of fish.

The turning point came when I realized we were having the wrong conversation. We were trying to argue that "genetically engineered ingredients are safe," which triggered immediate defensive reactions. We needed to shift the shared imperative. By working with Norwegian consultancies and engaging local voices first, we began framing Aquaterra® not as a novel GMO ingredient, but as a supply chain solution to an existential industry crisis. We had to prove that protecting the ocean and preserving the future of aquaculture required embracing biotechnology on land.

BEFORE

Defensive Positioning

Messaging focused on proving that "this is a genetically engineered ingredient that is safe," which alienated anti-GMO audiences.

AFTER

STRATEGIC ALIGNMENT

Messaging shifted to: "Without a land-based omega-3 solution, Norway's salmon industry faces a supply chain crisis that threatens its global leadership position."

Finding Signal: The Pan-European Consumer Survey

To convince Norwegian regulators and the broader aquaculture industry to adopt Aquaterra®, we needed undeniable proof that end consumers would accept the product. In August 2022, I designed and led a massive pan-European consumer survey across 2,280 respondents in the UK, Netherlands, Germany, Italy, Norway, and other regions. This was not merely a tool to measure existing opinions; it was architected as a persuasion roadmap to map the pathway from skepticism to acceptance.

The European Seafood Purchaser

Health-conscious grocery shopper

GOALS

+ Purchase high-quality, healthy seafood for their family
+ Support sustainable and environmentally friendly food systems
+ Ensure the food they consume is free from harmful toxins

FRUSTRATIONS

- Confused by complex sustainability labels and conflicting environmental claims
- Concerned about microplastics, heavy metals, and overfishing in wild populations
- Skeptical of genetically engineered ingredients due to a lack of transparent information

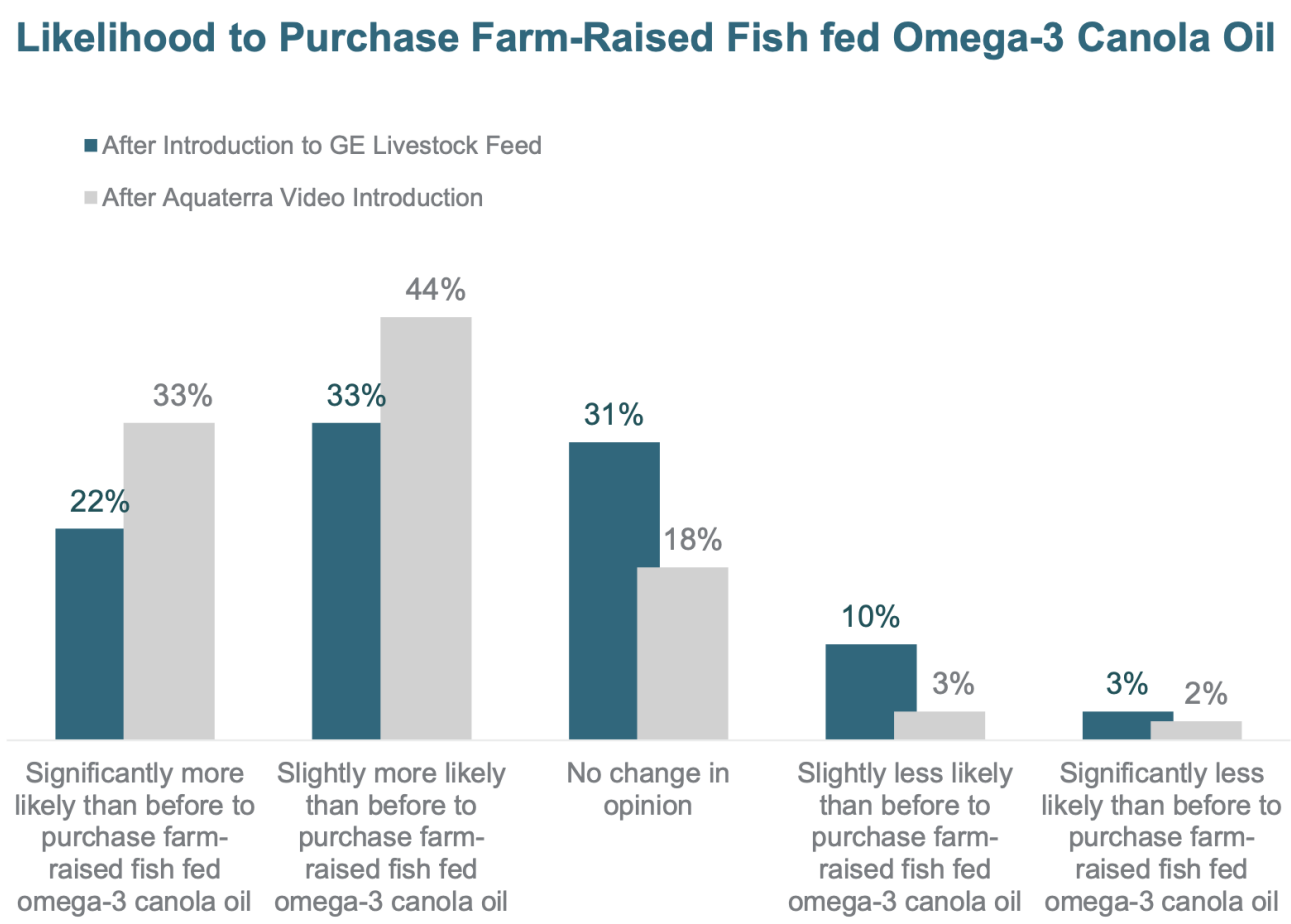
“I want to buy seafood that is good for my health and good for the ocean, but I don't always trust or understand how farm-raised fish are fed.”

The survey design carefully sequenced information: establishing baseline seafood attitudes, introducing the concept of genetically engineered food, describing omega-3 canola oil, exposing respondents to our broadcast-quality documentary, and finally revealing a critical contextual fact. We discovered that over half of the respondents were entirely unaware of what livestock eat, and many were initially uncomfortable with the idea of GE feed.

The breakthrough signal occurred when we revealed that 90-95% of EU livestock already consume GE soy. This single data point normalized the concept of biotech in the food system, transforming GMO from a frightening unknown into an existing, accepted reality. Following this revelation and exposure to the full information, 80% of respondents reported a high comfort level, and 76% held a positive impression after viewing the Aquaterra® video. This data neutralized the most powerful objection in the European market.

SURVEY METRIC	RESULT
Positive impression after Aquaterra® video	76%
Would consider purchasing Aquaterra®-fed fish	70%
Comfort level after full information exposure	80%
Prefer omega-3 canola oil over wild fish oil	59%
Feel safe with EFSA approval	72%

Key findings from the EuroProject Omega-3 Qualtrics survey (n=2,280)

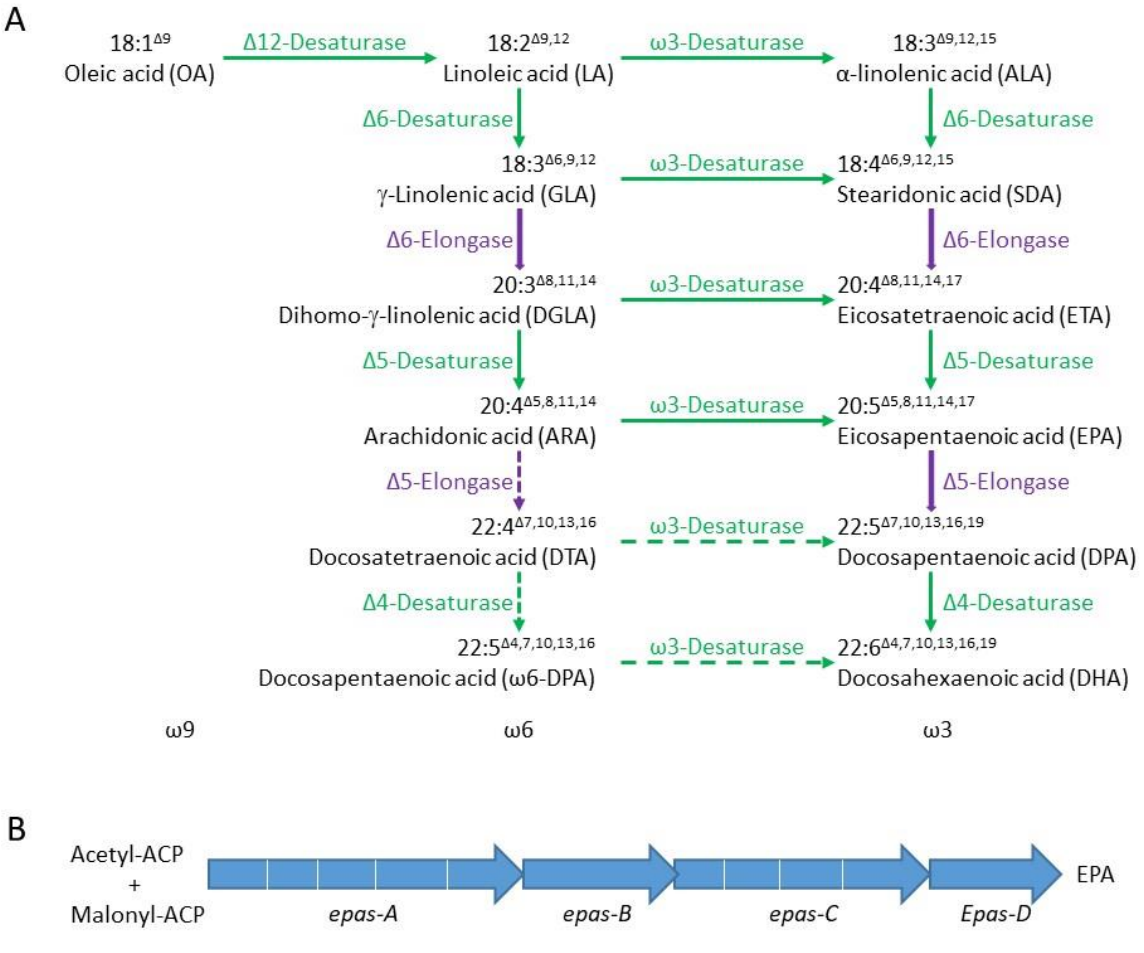


EuroProject Omega-3 Data Presentation

First Principles Design: The Communications Architecture

Coalition building without a robust communications infrastructure is just a series of disconnected conversations. To move the needle globally, I had to build a comprehensive 'Communications Architecture' from first principles. This

required translating decades of complex biochemical research into a narrative of global humanitarian and environmental impact that could withstand the scrutiny of regulators, scientists, retailers, and consumers simultaneously.



Biochemical Pathway Mapping

A critical piece of this architecture involved engaging global certification bodies. The World Sustainability Organization & Friend of the Sea® initially held a blanket non-GMO policy, making Aquaterra® categorically ineligible. Rather than accepting rejection, I engaged directly with WSO leadership. I demonstrated that their non-GMO policy existed to protect ocean sustainability, and by replacing wild-caught fish oil with a land-based alternative, Aquaterra® directly served the exact mission their policy was designed to protect.

The architecture also included empowering local voices. I prepared presentations to be delivered by Chilean and Norwegian peers in their native languages, recognizing that scientific credibility delivered by your own community is fundamentally different than a foreign company making claims. Every piece of content—from peer-reviewed white papers to trade media campaigns—was designed to give every stakeholder a reason to say 'yes' on their own terms.

1. **Map the Ecosystem**

   Identify every stakeholder across science, industry, government, and civil society, detailing their core motivations and primary objections.

2. **Find Shared Imperatives**

Locate the single undeniable truth that every stakeholder can agree on regardless of their starting position (e.g., ocean depletion).

3 **Build from the Inside**

Engage the most credible local voices and institutions first; allow foreign advocates to enter the conversation only after local trust is established.

4 **Change Policies, Not Just Minds**

When institutional rules stand in the way, engage leadership to understand the intent behind the policy and demonstrate how your innovation fulfills that intent.

5 **Prove the Market**

Execute large-scale consumer research to prove market readiness simultaneously with regulatory engagement.

6 **Tell the Story at Scale**

Deploy a multi-channel narrative—documentaries, peer-reviewed publications, award bids—where every channel reinforces the others.

Building & Testing: Industrial-Scale Validation

While the communications strategy was being built, we needed undeniable, commercial-scale proof that the product worked in the real world. Between 2018 and 2019, we executed massive industrial-scale feeding trials in Chile. This was a monumental logistical effort involving 2.65 million Atlantic salmon across 3 farms and 5 leading aquaculture companies. We tested Aquaterra® against traditional fish oil diets to measure productive performance, survivability, and lipid composition.

2.65 million

TRIAL SCALE

Atlantic salmon tested across 3 commercial farms in Chile

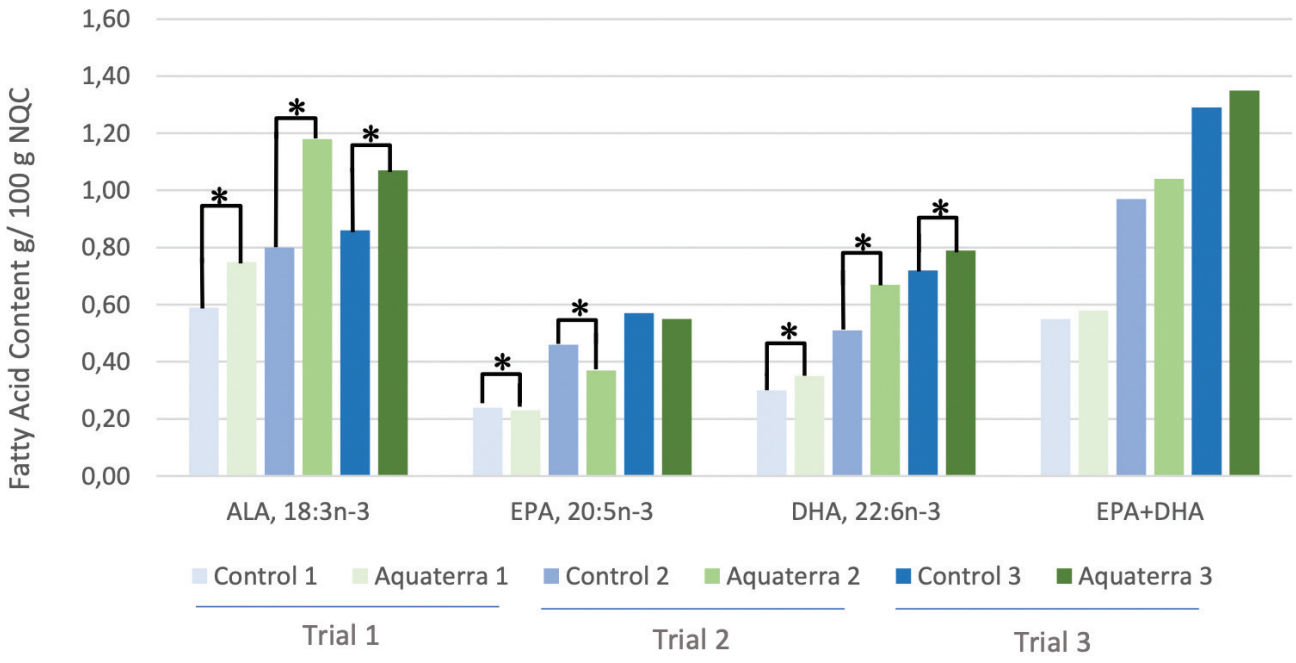
1.49% - 1.90%

MORTALITY REDUCTION

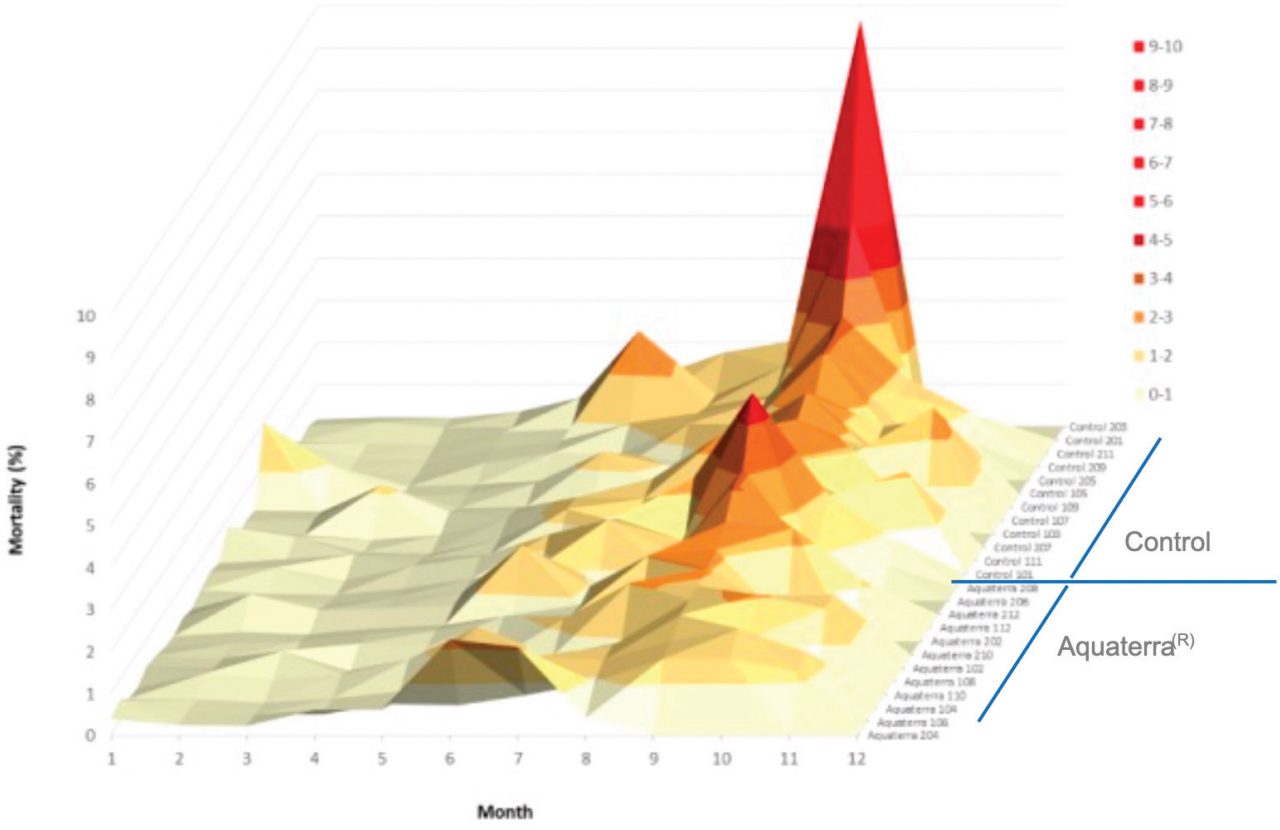
Lower mortality rates in Aquaterra-fed salmon compared to control groups

The quantitative results were staggering. Across the three trials, the cages fed with the Aquaterra® Omega-3 oil diet saw a 1.49% to 1.90% lower mortality rate compared to the control diets. In terms of biomass gain, this represented an increase of 44.6 to 77.8 tons at the respective sites. Furthermore, the fish exhibited higher resistance to environmental stresses, including low oxygen concentrations and amebiasis outbreaks.

Nutritionally, the trials confirmed biological equivalence. The total omega-3 fatty acid levels in the fillets of fish at harvest were significantly higher, resulting in a highly favorable omega-6 to omega-3 ratio. We authored and distributed a comprehensive white paper summarizing these findings across global aquaculture trade publications, which became the scientific credibility anchor for all subsequent regulatory and industry conversations.



Trial 3 Lipid Composition Results



Mortality Rate Comparison

Launch & Validation: The Documentary and Policy Transformation

To launch the narrative globally, I produced a broadcast-quality documentary in coordination with the World Ocean Council and Special Interest Films (UK). Filmed across Canada, Australia, Montana, and Washington State, it featured canola farmers, fish farmers, and executives discussing the global imperative of sustainably feeding 8 billion people. Featured as an episode of 'Ocean Titans' and distributed on Reuters, the documentary bypassed traditional corporate promotional tropes and placed Aquaterra® directly within a global humanitarian context.



Fig. New image, add a caption

The impact of the communications architecture began to manifest in unprecedented policy shifts. The World Sustainability Organization officially changed its global policy to recognize that GMO-derived ingredients could qualify for certification if they demonstrably advanced ocean sustainability. Consequently, Aquaterra® became the first GMO-derived ingredient globally to receive the prestigious Friend of the Sea® certification.

Validation cascaded across the industry. Aquaterra® was named a finalist for the Global Seafood Alliance's (formerly Global Aquaculture Alliance) Sustainability Innovation of the Year in 2020, providing peer validation from within the aquaculture industry itself. Furthermore, through strategic engagement at a Climate Week event in New York, I helped influence the UN Ocean Stewardship Coalition to include explicit consideration for biodiversity in ocean-based businesses within an Ocean Treaty, cementing a global legal framework that supported land-based omega-3s.



Recognition from the Global Seafood Alliance

Traction & Growth: Norway Says Yes

The culmination of this multi-year, multi-stakeholder effort arrived in 2023 when Norway officially approved Aquaterra® for use in aquaculture feed. We achieved the impossible: securing the first biotech-derived ingredient ever approved for aquaculture feed in a formerly anti-GMO nation. This approval did not happen because the science improved—the science was already proven. It happened because every stakeholder was given a reason to say yes in their own language, through their own trusted institutions.

$80M

REVENUE GROWTH

Scaled from $0 to $80M by 2022, prior to final Norwegian approval.

1 Million+

DOCUMENTARY VIEWS

Viewership of the 'Ocean Titans' episode distributed on Reuters.

The commercial impact was massive. During the coalition-building phase alone, Aquaterra® grew from $0 to $80M in revenue by 2022. The brand architecture I designed—science-forward, trust-anchored, and sustainability-cer-

tified—successfully withstood the intense scrutiny of regulators, scientists, retailers, and European consumers simultaneously.

The broader scientific community also recognized the magnitude of this achievement. I authored the winning bid for the 2024 Eureka Prize—Australia's most prestigious science award—translating decades of CSIRO and Nufarm research into a celebrated narrative of environmental impact. This elevated Aquaterra® into the national science conversation and cemented the credibility of the partnership.



Aquaterra Brand Identity

What I Learned: The Power of Strategic Empathy

Building a zero-to-one product in a highly regulated, culturally resistant market taught me that innovation cannot survive on scientific merit alone. When institutions stand in the way, you cannot simply argue against their policies; you must engage them on their own terms, understand the core intent behind their rules, and demonstrate how your solution actually fulfills that intent better than the status quo.

I also learned the profound importance of sequencing information. The pan-European survey proved that consumer skepticism is rarely rooted in malice, but rather in a lack of context. By revealing that GE soy was already a staple in European livestock feed, we didn't just win an argument—we shifted the entire paradigm, turning a frightening unknown into an accepted reality.

> *“People and animals need omega-3 oils, and Nuseed helped us develop a sustainable source that greatly benefits consumers around the globe.”*
>
> — Dr. Surinder Singh, Chief Research Scientist at CSIRO

Ultimately, this journey reinforced that true coalition building requires strategic empathy. Regulatory bodies do not approve ingredients in a vacuum; they approve what markets are ready to receive. By simultaneously building market readiness, engaging local scientific voices, and crafting a unified, evidence-based narrative, we achieved what an entire industry previously believed was impossible.

Lead with Empathy, Not Just Data

Understand the emotional and cultural drivers behind stakeholder resistance before deploying scientific arguments.

Contextualize the Unknown

Normalize new technologies by anchoring them to existing, accepted realities in the consumer's daily life.

Build from the Inside Out

Leverage local, trusted institutions to validate your claims rather than relying solely on foreign corporate messaging.