NEW ZEALAND
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Manatū Aorere

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Aquaculture in Norway

MARKET INTELLIGENCE REPORT

Summary

- Norway is a global leader in aquaculture thanks to its clean coastal waters, strong regulatory framework, and investment in innovation. The industry, centred on salmon and trout farming, is a key contributor to the economy and has grown significantly over the past two decades, although recent challenges such as sea-lice, environmental concerns, and regulatory constraints have impacted further expansion.
- Norway's experience offers valuable insights for New Zealand, particularly in sustainable growth, research, regulation, and the development of specialised aquaculture technology and services. Shared sustainability goals and a strong focus on research and development make Norway a promising partner for collaboration and joint development in aquaculture.
- The biennial Aqua Nor exhibition in Trondheim, showcases the latest aquaculture technologies and attracts global attention. This year's exhibition will be held from 19-21 August 2025. Aqua Nor offers opportunities for businesses to showcase solutions needed in the industry, including innovations in sustainable feed, and specialised services in fish health and pest management.

Report

Norway's Aquaculture Sector

Norway benefits from an extensive coastline of clean seawater ideal for marine farming. In addition to Atlantic salmon and rainbow trout, Norway farms cod, halibut, and char, as well as seaweed and mussels. The industry consists of 215 companies (172 focused on salmon/trout), most of which are small and medium-sized enterprises. The four main "grow-out" systems used for raising juveniles to market size are pond, cage, flow through, and recirculating aquaculture systems (RAS). The industry is concentrated from the west coast of Norway up to Nordland. Since 2010, growth has been strongest in the north, where there are more suitable sites and fewer biological challenges.

In 2024, Norway had its best year ever for seafood exports, with 1.3 million tonnes of seafood from aquaculture shipped offshore. The value of exports from aquaculture amounted to NOK 130.6 billion (NZD 21.77 billion), an increase by 2 percent compared to 2023. Aquaculture accounts for 74 percent of the value, and 48 percent of the volume of Norway's total seafood exports. In 2024 the largest markets for Norwegian seafood exports were Poland, Denmark, and the US. China had the highest growth in export value in 2024, with an increase of 10 percent on the previous year, followed by South Korea, United Kingdom, Netherlands, and Vietnam.

While Norway continues to be the top global producer of salmon, environmental issues, and an increased prevalence of sea-lice (which led to production restrictions through a "traffic light" regulatory system introduced in 2017) puts limits on growth. In 2023, a new resource rent tax was implemented. Originally set at 40 percent, following criticism from the industry, the tax was later lowered to 25 percent.

The regulatory environment

Norwegian aquaculture is regulated under the Norwegian Aquaculture Act which seeks to balance competitiveness and sustainability. In addition to the Aquaculture Act, key rules for the establishment and operation of aquaculture are set out in the Food Act and the Animal Welfare Act. Compliance is monitored by the Norwegian Food Safety Authority.

A "traffic light system", developed in 2017, divides Norway's coast into production areas where growth in production capacity is permitted or restricted based on environmental conditions. A production area is assigned a colour based on the estimated risk of sea lice

spreading to wild salmon in the area. Colours are determined by an area's wild salmon's mortality rate resulting from sea lice. Green is given for rates of 0–10% mortality, yellow for 10-30%, and red for anything above. In red zones, farms must reduce output by 6%. Traffic light ratings are reviewed annually by an expert panel and published on the traffic light system website. The publication provides industry the opportunity to provide input on the scientific basis of the decision before the traffic light system colours are applied to the production areas.

The Norwegian Parliament introduced a resource rent tax on aquaculture, applicable to the farming of salmon, trout, and rainbow trout on 1 January 2023. The effects of the tax included share prices falling and some companies indicating future projects and large investments would need to be put on hold. Following industry pressure, political agreement was reached to reduce the resource rent tax on agriculture from the originally proposed 40 percent to 25 percent. The new tax requires that revenues must be based on the market price at the stage of the production process where the fish leaves the pen. A challenge with this is that sale of fish to a third party directly from the pen rarely occurs. In response to the issues around setting market prices, it was decided that an independent price council would set the fish price when the fish is removed from the pen.

In April 2025, Norway's Minister of Fisheries and Oceans, Marianne Sivertsen Næss, presented the White Paper "The Future of Aquaculture - Sustainable Growth and Food for the World". In the report, the government outlines reforms to the country's aquaculture regulations, including incentivising sustainability measures and fish welfare. The Minister noted that the new management system will make it more profitable to operate with low environmental impact and good animal welfare and give operators the ability to influence the growth opportunities of their own businesses.

Key features of the proposal include:

- **Regulating fish lice impact** using tradeable quotas for sea lice emissions. The total level of quotas will be established by regulatory zone, based on the carrying capacity and environmental objectives for the zone, with no possibility of trade between zones.
- Reducing the **mortality rate** for farmed fish to 5 percent
- **A new aquaculture license** granting the right to produce in a specific geographic area, but with no volume or species restrictions. By introducing more targeted management of sea lice, the government believes the production volume limits imposed by the traffic light system will no longer be needed. Those who implement more environmentally friendly production methods will be able to increase production.
- To ensure improved distribution of public resources, the government also proposes that new licenses under the Aquaculture Act be allocated by auction.
- A push for increased use of closed containment "zero emission" (of sea lice) aquaculture facilities.

Broad political backing was achieved in the Storting (Norwegian Parliament) in June 2025, with the aim of new regulation being in place in 2-4 years. In addition, the Storting tasked the government with developing a strategy for circular economy within aquaculture, to be presented in 2026. Until the new regulation has been developed and gone through the consultation process, the existing framework including the traffic light system will remain.

Innovation and challenges

Norway's industry has embraced technological advancements such as automated feeding systems, underwater monitoring sensors, and data analytics for optimised growth. Monitoring systems enable sonar equipped computer-vision algorithms to gauge variables in fish size and sea-lice infestation. The development of advanced fish vaccines in the 1990s has improved overall fish health, reducing the need for antibiotics, and enabling the industry to prevent outbreaks of damaging diseases. Land-based facilities are increasingly utilising RAS to reduce environmental impact and improve biosecurity. The industry still faces challenges related to disease outbreaks, environmental impact, and sustainability. Sea lice infestations can impact fish health, leading to increased health treatment costs. Escapes from sea cages and potential genetic interactions between farmed and wild fish are also cause for concern. Several salmon lice controlling approaches have been trialled including chemical treatments, feed additives, and 'cleaner fish'. These approaches are costly, but required by the traffic light system in order to prevent the destruction of wild salmon stocks.

Feed is another costly factor in aquaculture, and one which could benefit from further innovation. To date, innovations include changing the physical structure of pellets, making them sink slower. This reduced pollution and waste by improving the amount of feed that was eaten before it reached the sea floor. The industry's dependence on marine ingredients became both an economic and environmental concern in the mid-1990s. However, with improved nutritional knowledge marine ingredients have been mostly substituted with plant-based ingredients. Today, marine ingredients constitute approximately 25 percent of the average salmon feed, resulting in claims that salmon aquaculture is now a net contributor of marine protein.

Increased knowledge about nutrition may lead to further developments in feed. There is potential in using micro- and macro-algae as well as insect meal as replacements for fish meal. Furthermore, plant oils such as palm and rapeseed have emerged as candidates to replace fish oil, though so far these ingredients are not competitive on cost. With sufficient nutritional knowledge, aquafeed is likely to develop to resemble the production of most animal feeds where modelling is used to find the mix of ingredients that gives the greatest performance at the lowest cost.

Opportunities and learnings for New Zealand

With the exception of the proximity to European markets, New Zealand shares many of Norway's success factors. Similar views on climate, environment, and sustainability, may also help facilitate cooperation and exchange particularly on developments in research, technology, and regulation to ensure that growth is achieved while limiting adverse environmental impacts.

Factors that influence Norway's aquaculture cluster are a long coast with clean, cold water, a skilled work force, well-developed infrastructure including necessary roads, bridges, ferries and airports, and local business communities that can supply support services. In addition, Norway has a competent, efficient bureaucracy with low corruption and a clear regulatory regime, good educational opportunities relevant for the sector, research environments with extensive expertise in fish health, ecology and water quality; and finally, reasonable proximity to important markets in Europe and free market access into the EU in particular.

As the Norwegian industry has grown, farming technology has become increasingly specialised, leading to the emergence of specialised equipment (e.g. fishnets), and technology and services (e.g. maintenance and logistics). In particular, companies such as Akva Group, Scale AQ and Fiizk have significantly contributed to the development of farming technology and production practices.

Since the 2010s, many of the traditionally labour-intensive maintenance activities in the production processes have been outsourced to independent companies, making each function more specialised. Recently, the larger firms have started centralising the monitoring of feeding and fish health. This has resulted in various tasks being moved away from the farms. The increased specialisation and centralisation also presents opportunities for businesses providing relevant technologies and services within each function.

Aqua Nor, Trondheim, 19-21 August 2025

Aqua Nor, the world's largest aquaculture technology exhibition, attracts around 25,000 visitors from around the world, including attendees from all the major aquaculture nations as exhibitors, visitors or official delegations.

Modern aquaculture is a knowledge industry with advanced technology in all aspects of the industry from breeding and feeding regimes and the construction and operation of floating cages, nets and safety equipment, to the handling of fish, veterinary medicine and biomass control. Aqua Nor 2025 will cover all aspects of the industry including hosting a range of interactive pavilions, and showcasing the latest innovations.

The exhibition kicks off with the Aqua Nor Conference on Monday 18 August. The theme of this year's conference is "More food from the oceans – Contributing to the green shift through expanding aquaculture production". Topics include: the state of world fisheries and aquaculture, aquaculture technology, global developments in seaweed production, industrial production and utilisation of macroalgae, aquaculture assurance, fish feed and algae farming, and circular potential.

More detailed information on the exhibition and conference can be found on the Aqua Nor website.

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