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 Intelligence

The keys to making land-based and offshore aquaculture work? Scale, scale, scale

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By Jason Holland

It's not just about onshore or offshore – GOAL hears that aquaculture needs to steam ahead on all fronts for the sake of food security



Clockwise, from top left: Johan Andreassen, Atlantic Sapphire; James Wright, GAA; Erik Heim, Nordic Aquafarms; Alf Gøran Knutsen, Kvarøy Arctic; Ohad Maiman, Kingfish Company.

This year's GOAL began with keynote Dr. Peer Ederer, program and science director at the Global Food and Agribusiness Network (GFAN), advocating technology as a means to produce sufficient food in a responsible and efficient manner to feed a population of 10 billion people by 2050.

Fittingly, the conference closed with some of the leading pioneers of new aquaculture technologies waxing lyrical about the critical roles that land-based systems and production in deep waters can have in addressing what Ederer had dubbed the planet's "most fundamental challenge."

"GOAL 2020 Day 1: Aquaculture addressing the world's 'most fundamental challenge' (https://www.aquaculturealliance.org/advocate/goal-2020-day-1-aquaculture-addressing-the-worlds-most-fundamental-challenge/?_hstc=236403678.0a298e6d82b049d201aaf70258357bda.1680904410499.1680904410499.1680904410499.1&_hssc=236403678.1.1680904410500&_hsct=236403678.1.1680904410500)"

While aquaculture in near-shore waters has had stellar growth in past decades, the long-term constraints of access to suitable environments has long been on the industry's radar. This knowledge paired with new technologies has brought new production solutions to the fore.

The benefits of recirculating aquaculture systems (RAS) are well documented: stable production, location versatility, lower dependency on medication and reduced exposure to disease and environmental threats. Not to be outdone, there are also many unique advantages to conducting fish farming in open ocean locations, including exposing the fish to strong currents that support growth and deal with waste, and taking operations from shoreline restrictions which in turn frees up precious coastal space.

Beyond these values, though, GOAL delegates heard that the biggest collective opportunity for both RAS and offshore aquaculture is to scale production and thereby increase the amount of precious seafood available to consumers.

"I think we all recognize it's critically important that we scale seafood production from a planetary perspective and from a consumer health perspective," offered Neil Sims, CEO at Ocean Era, an open-ocean mariculture technology start-up. "It's so important that we grow this industry that we don't have a luxury of betting on either red or black – we've got to push on all of the available levers. We have a global crisis where we desperately need seafood. We must scale in all ways that are sustainable."

Broadening support

With SalMar Chairman Alte Eide earlier informing GOAL attendees of his company's belief that offshore aquaculture will drive the further growth of Norway's salmon farming industry, accounting for as much as 70 percent of its growth from the current level of 1.3 million MT to its target of 5 million MT by 2050, Sims said that support for offshore aquaculture generally has followed growing awareness among policymakers and consumers that aquaculture as a food production system is a viable pathway to meeting future requirements.

"I think it comes back to this imperative that we all feel – that we absolutely have to be doing this," he said. "This is becoming abundantly apparent among the leading environment NGOs like WWF, Conservation International and Nature Conservancy – they are being a lot more vocal in their support of aquaculture generally, but also offshore aquaculture.

"I think there is going to be a lot more support for this industry and for the growth that we need, so we won't be bumping up against the social licensing that have been the primary constraint to growth to date."



Clockwise from top left: James Wright, GAA; Dick Jones, Blue Ocean Mariculture; Neil Sims, Ocean Era; Philip Schreven, De Maas SMC/Pan Ocean Aquaculture.

Investor interest

While RAS technology has been around and producing fish for a couple of decades, it has also moved on from just rearing larger juveniles for transfer to grow-out sites to also producing fish all the way to market size entirely indoors.

Moving into facilities like this with scale is a different ballgame, acknowledged Nordic Aquafarms President Erik Heim.

"They are complex projects, and it's important for anyone looking at this, like investors, to recognize that there's no off-the-shelf solutions for companies," he said.

Investment has certainly been pouring into RAS, with dozens of new projects announced in recent years, and while Heim doesn't expect all of these to reach fruition, and believes that following the "explosion of interest" the sector will settle down over time "like any other emerging industry," he's also confident that success will come.

"What's special about land-based is you have four- to five-year development cycles, and what we are seeing is that success at moderate scale is driving market interest, and also the confidence that this success can be scaled up to the larger scale.

"There's some assumptions and risks in all that, but if you look at the last two to three years, more and more risk issues have been addressed. There's some remaining, but it all comes down to concluding whether the risk is acceptable or can be resolved as we move along," Heim said.

An important consideration for investors is that there are a lot of differences in the planned land-based projects, which requires investors to do their due diligence, he added.

"That's challenging in a very fast-moving market. All of our companies are continuously innovating along a number of different workstreams and it's tough for investors to keep up with that," said Heim. "But that's the landscape that investors have to navigate in."

Market need

Aside from the actual fish production, what's crucial to RAS is delivering a product that consumers want. With a large number of these facilities planned for the United States, the conference heard that there's a clear opportunity to add volume and diversity to the market, while navigating the tough regulatory boundaries that have so far hindered near-shore operations.

Highlighting the U.S. seafood deficit of close to \$17 billion (€14.5 billion) and domestic consumption that is increasing at 8 percent per annum, Johan Andreassen, chairman and CEO of Atlantic Sapphire, pointed to the vast areas of land potentially available to land-based aquaculture.

From its Miami location, and following its Bluehouse system's first commercial Atlantic salmon harvest in September, his company is now producing around 1,000 metric tons (MT) of fish per acre.

"You can do the math – we can basically fit 1 million MT of production in Miami Bay without a problem – just by buying farmland. I think that land-based and RAS is going to be the main source of seafood in the United States," he said.

Andreassen is also confident that the market will welcome his product.

"Internally, we knew that this was going to work, so it's not a big surprise for us. We've been testing the fish, sending out samples to customers for a long time, but obviously to see an American product on the shelves of high-end U.S. grocers is a very pleasant feeling," said Andreassen. "The focus going forward now is to make sure that we can deliver every week consistently and with the right volumes and with high quality. I think the American consumer will get a better product than they have seen before – because of the freshness and consistency of the product – so we are very excited about the market acceptance of this product."

Another company looking to crack the U.S. market, this time with yellowtail kingfish (*Seriola lalandi*), is The Kingfish Company. Having already constructed a facility in the Netherlands and successfully launched its fish into the European market, it aims to start construction of its Jonesport, Maine, farm in the second half of 2021.

Again, CEO Ohad Maiman sees the market as a good fit for RAS.

"I think that once the technology is proven technically, taking a wait-and-see approach may be an entertaining spectator sport, but it's a sure-fire way of missing the train," he said. "It is important, though, in my view not to look at RAS as a silver bullet for everything everywhere. But as a product-market-technology fit. RAS, in our view, works best for high-value species in import-dependent markets."

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Jason Holland is a London-based writer for the international seafood, aquaculture and fisheries sectors. Jason has accrued more than 25 years' experience as a B2B journalist, editor and communications consultant – a career that has taken him all over the world. He believes he found his true professional calling in 2004 when he started documenting the many facets of the international seafood industry, and particularly those enterprises and individuals bringing change to it.

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