

The Future of Aquaculture

with Siri Vike of PHARMAQ



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PHARMAQ Analitiq provides high quality analyses within the salmon industry, with the aim of safeguarding fish health and welfare in the aquaculture sector.

We caught up with General Manager, **Dr. Siri Vike** to talk about the challenges of vaccination, big data and technology advances, and the future of aquaculture.

Dr. Vike has 24 years experience in fish nutrition, fish health and welfare in Chile, Canada and Norway. She has had different roles as fish farmer, researcher and supplier to the salmon industry.

What is the main challenge of vaccination in non-Salmon species?

The main challenge is to **find the optimal combination of antigens** – meaning providing protection against the correct diseases to combat. Often there is a cocktail of different pathogens and if we only have protective antigens for the main challenge in our vaccines – the customer will not see the desired effect and may still experience mortality, or the need for intervention with therapeutic products. So **better pathogen mapping and understanding of pathogen interaction is needed for several species**, which is particularly important for species where vaccination is not yet standard industry practice. But we know the recipe: to copy the work done on salmonids is a good starting point.

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Do you see the future of aquaculture moving in-land with RAS systems located near large population centres, or do you see it moving further offshore with open-ocean aquaculture?

Yes and yes! Aquaculture needs more space and water of the correct quality for future growth. This can be realised by **moving both to bigger in-land and deep-sea offshore facilities** - both open, semi-closed and closed containment systems. We have seen huge investment in the salmon industry in high tech RAS facilities, to better control the freshwater production period and produce bigger smolts before sea transfer. At the same time **the industry is copying the oil-off-shore technology** to be able to move into the more rough sea areas. However, new technology gives new biological challenges and the need for monitoring fish health and fish welfare indicators are increasing. Once we have control over the biology, efficiency and costs will fall into place.

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The major protein sources - beef, pork, and poultry - saw significant consolidation amongst the producers as the industries matured. Do you anticipate that sort of consolidation occurring in aquaculture in the next few years?

For the salmon industry in Chile, UK and Canada there has been a continual consolidation process, but in Norway the process has been more slow - due to political leads and good economy in the smaller companies. For other species like sea bass/bream, tilapia etc, it seems like consolidation will continue as we have seen in other industries. The reason is of course that the **aquaculture production can still increase and fill the expected protein-gap** that comes along with a growing global population, and big players see this opportunity.

What are the disruptive digital and big data technologies that you feel will make most impact in aquaculture going forward?

The biggest challenge for further growth in aquaculture is fish health and welfare, so improved biological sustainability is needed.

The use of **preventive analytics** based on big data analysis will be needed to get the industry on the "next level", to reduce loss and get improved harvest yield. Big data analysis gives better preventive tools/insight and consequently better management decisions. This process is already going on and I have great expectations for where this work will lead us.