Webinar 1: Scaling alternative feed ingredients - A System's Perspective

Intro: Marcela Navarro, Project X

Welcome and thank you for joining us. We have over about 80 people joining us today.

What does action mean when we talk about systems? This is to realise that this is more than a sprint - we are in for the long haul.

Presentations: Value Chain Perspectives on Risks and Scale Up of alternative ingredients for feed

Salmon Farmer perspective

Dr Harald Sveier, Manager, Ocean Harvest, The Lerøy Group,
Leroy is Norwegian based we are listed on the stock market and we have 4700 employees and revenue of 20 billion NOK equal to 2 billion euros. We produced 180,000 tonnes of salmon and trout together with a white fish catch of 62,000 tonnes, making us one of the largest European seafood suppliers. We are also buying a lot of seafood from other suppliers so in general we are producing 400,000 tonnes of seafood every year so we are one of the big players in this market

We have had a huge focus on Feed ingredients and alternatives since 2015 and we have been a first mover in several of these new feed ingredients because we need more sustainable raw materials for fish feed. By sustainable I mean also raw materials that are not used for human consumption. We need to reduce our dependency on fish meal and fish oil because our wild fisheries are limited and as the agriculture industry is growing we need aquaculture to work for human consumption. We are looking to increase the health rewards from salmon and address animal welfare concerns.

So what did we do well so far? Since 2015; we kept the level of EPA DSA to 7.5% of fatty acid while the rest of the industry reduced to 6%. I know there are some Scottish companies that have also kept it at a higher level, but we kept it at 7.5% and then we started using camelina oil which is quite rich in Omega 3 fatty acids and giving a better 3:6 ratio where the Omega 6 to Omega-3 ratio is below 1. From a human health point of view that is important because we eat too much Omega 3 and too little Omega 6.

Back in 2017 we really started using Omega 3 rich oils from micro algae. We started it with Corbion and today we're using this product from three different companies. In 2019, we are the only large farm company using insect meal. In feed we are using today, we are covering the gap between 6% and 7.5% in the omega oil. Early on, the price of microalgae oil was about twice the price of fish oil with a similar EPA DHA and we had to absorb this higher cost for the production and the feed. Over time this price has come down as demand has increased. There are now four suppliers of micro algae that have learned how to produce this oil and make their production more efficient so the price has started to come down, but still it's definitely more expensive than the best fish oil you can get. So in 2019 we start using insect meal in all our freshwater diets.

We are closely working with our feed suppliers, they have the organisations and they have their facilities to evaluate new raw materials, but we also know that the fish feed suppliers have limitations. As one of the suppliers of novel ingredients told me once when you have fought this hard to get to tonnes of production of your new raw material and then no one is buying, but they say, what are we going to do until we have 40,000 tonnes? This is a typical raw material story, but we've been working quite closely with Skretting, with Biomar and Ewos-Cargill.

We have an established ocean harvest within the Leroy organisation that we had together with Bellona, this is where we are focusing on seaweed as an animal feed supplement reducing climate gases and improve the gut health of the animals. We are also working with blue muscle proteins as a new novel marine protein source for fish farming and we are doing this in an industrial scale. We research about the harvesting method for producing and we are dependent on the fish feed companies for doing the biological tests and the

chemical tests. There are many challenges with all these opportunities and all these new raw materials, well of course we have regulations but we can deal with that, regulations can changed.

There are plenty of opportunities out there for you to produce insect meal with different insects that have different raw material inputs. We also have a lot of focus on carbon footprint as the process is using electrical heat when you are baking dry protein or oil. All these are manageable but what we're really struggling with is the cost.

The cost of the raw material for new ingredients is high because if you are the first mover it's really a chicken and egg situation, you have to pay more which is what we are comparing us with but the problem is getting the cost back from our retailers so everyone is happy. Everyone is very happy when we tell them that yes we are using these new raw materials we are reducing our footprint and so on, but very few are willing to pay anything extra for that fish. My CFO is coming to me and asks why are we using the material if no one is willing to pay what we are putting into the feed, into the fish. Why should we do it? What we're really looking at is the willingness from retailers to pay what it really costs to use these novel ingredients and then have to put the cost on the end consumers.

Questions:

Do you only use algae oil, or also the whole algae biomass as feed?

This depends on who's is producing it. It's not a big challenge we can use both

I would love to hear from all speakers about how to solve the 'beetle-egg' problem of cost.

It's very possible to get what we need to get cost covered from the end consumer, but so far we really don't experience that retailers are willing to take on that cost and move it forward

Can you expand on the barrier to production growth that is a driver for seeking alternatives. What is needed for your plans to expand?

Where we have a selling point is that we have reduced the footprint of our fish where we have included the sustainability of our production but if you can't put that down as a selling point it just becomes a nice slogan. We don't live on them; we can't eat slogans so we need to get the extra money we are paying for this investment. For instance the micro algae produce it so that the camelina producers get that money back and I think it's an industry responsibility or part in the value chain to see what responsibility is to take on that cost. At the end everyone in the value chain has to get their cost covered.

The blue mussels that you mentioned - are these harvested from the wild or can these be cultivated?

For our production we are using cultivated mussels, only cultivated ones, not used for human consumption. We need to know the quality of the blue mussel protein so it is being cultivated at the moment and we are processing it about four times in an hour and with little equipment. We want to expand in the future.

Perspective as an investor:

Frederic Feve, Sustainable Impact Venture

The challenge is a lack of liquid capital at the right stage of companies scale up journey. The fund, SIV, was set up as a fund and wider platform to promote these innovations and essentially enable the family offices to engage more directly with them. SIV is focused on identifying and investing in some of the most innovative companies at the 'Farming and Production' end of the agribusiness supply chain.

There is a team of sustainability and technical expertise and we believe that these complementary experts should support the innovative companies and this creates a sense of partnership or trust in roles of the platform together with project x – it extends the financing arm. The team shares a common history of active investment in early stage companies. This shared approach emphasizes creating value add for the companies¨ working pro-actively with the management teams and leveraging synergies and networks to support their potential.

The platform offers a unique combination of capital and commercialization expertise offers a powerful proposition to optimize development scale up and time. Strategic funding is very important in the setup we bring together a substantially large number of family offices that are interested in expanding innovation – we start with an initial number of 12 companies, some selected from the FEED-X programme but also what these partners families want to support funding including geographies. Investments Typically $0.5M to $1.5M for initial investments and we would continue to invest in follow-on rounds of up to $10-$15 M.

Our partnership with PX allows us to establish a portfolio of innovative market ready companies that have been de-risked using a multi-dimensional index of sustainability. This creates investment confidence to deploy funds building them in phases to scale up stage. Its about the right type of scale up funding at the right time in the right way that can make a difference to these early companies - to be able to go from producing kilos to thousands of tonnes to meet the market price point requirements of feed companies is a challenge we feel able to address.

Innovator Perspective

Ian Carr, Business Development Director, Veramaris

There is not enough fish available in the world today to meet the needs of the growing population both people and animals and so because of that Veramaris pioneered the world's first micro-algae product. It started with NASA scientists working on the challenge of growing food in space in the 1980s and discovering algae that produces very high levels of Omega 3 and that's why there's a picture of the moon opposite a salmon cage together.

July last year we built a new state of the art facility, which will at last enable us to deliver a realistic alternative supply of product. You can see the picture on the right-hand side, there is the first tanker full of our algae oil leaving the new plant in Nebraska in the beautiful sunshine. The zero-waste facility in Blair, Nebraska, USA was completed in May ahead of schedule, on budget and with zero-accidents. Next step is ramp up for full production. A $ 200 million dollars of investment in the company and the first containers of the oil are set to depart - at full production capacity, it will be able to produce enough oil to be roughly equivalent to 1.2 million metric tons of wild-caught fish.

This unique strain of natural marine algae is rich in both fatty acids, EPA and DHA, and together with the technology to cultivate it at a very large scale, is a breakthrough that expands the future supply of healthy seafood without impacting ocean resources.

The levels of EPA and DHA omega-3 in farmed salmon have declined significantly over the past ten years. Veramaris' algal oil, contains twice as much EPA and DHA as fish oil, so it can reverse the decline, and support the salmon brand-promise for healthy nutrition. This is also good news for the health and robustness of the salmon itself.

The product reduces dependence on wild catch fish. Every 1kg of our natural algal oil replaces 60kg of wild catch fish otherwise used for fish oil in pet food formulations. It also delivers three times the concentration. offers an EPA & DHA concentration exceeding 50% and is free from any ocean-borne contaminants. This gives us enough capacity to supply at least 15% of the global salmon industries' requirement. From here we expect really good progress.

A huge increase in farmed fish needed to meet the needs of the growing population and the challenge is that now that the 30 billion dollar salmon farming industry rests on limited availability of fish oil, and the second truth is that there just isn't enough sustainably sourced fish oil to enable the next phase of growth. If it is to continue to grow to meet changing consumer needs, and changing consumer interest, without also changing his/her practises, and because change rarely comes without risk. That is why the support of FEED-X and F3 Challenge are really important.

At an operational reputational risk perspective these are all reasonable barriers to adoption of new technologies like our algae. Key players in the value chain know about this but they also know that the biggest risk would actually be not taking decisions at all and therefore compromising the sustainable growth of our

great industry. Feed companies, farmers, processors and retailers are all in this together and they are all vulnerable to the risk of not changing their practises. It plays out in different ways to different stakeholders. For retailers for example the risk is from the ability in the nutritional value of salmon, specially Omega 3 content. There's a recent paper from scientists at the Institute of aquaculture at the University of Stirling that detailed really nicely where twenty pre-packaged fresh salmon fillets, were purchased from 10 main UK-wide retailers and analysed for their nutritional compositions. The level of marine oils reflecting that included within salmon feeds and where EPA + DHA contents in the Salmon varied from the equivalent of supplying 26 to as much as 67 % of the recommended EPA + DHA weekly intake suggested for optimal cardiac health in adults.

Article: https://www.sciencedirect.com/science/article/abs/pii/S0889157520313235

So, not only is it about the green footprint, carbon footprint, but it is also about the health possibilities reached in the product and the value chain motivation for different stakeholders to make change happen in their own value chains. Of course we all know that the change takes time and companies have to go through their own change curves summer variable rates of adoption of these technologies in the industry together

I think the focus is on growing a better fish like the one that you see on the screen. Then when that delivers both the healthiness and sustainability promised performance in salmon, this is how barriers to commercialisation technology are being overcome.

Great progress is being made already. The current focus for Veramaris is on scaling up the deployment of the algae. Its estimated that already around about 1/3rd of the salmon production in Norway is reared on feed containing Omega-3 algae technology which is which is great for Farmers. From Veramaris perspective, this is possible through non exclusive agreements of because the market is very competitive and farmers can switch their plans, their suppliers, quite regularly and they need to know that they can access these ingredients in their feed. Retailers also independently, need the same assurance through their food supply. They have to build a brand around the Omega 3 levels or try to differentiate or recover the customer market through that continuity.

Secondly in order to do that they need to collaborate, you see on the right hand side of the screen there is a site that belongs to Linkalaks, one of the first adopters. As early as October 2018, Lingalaks has been feeding 50% of their salmon production a diet produced by Skretting which includes omega-3 EPA + DHA algal oil produced by Veramaris. Feeding salmon with natural marine algal oil resonates strongly with the sustainability efforts of numerous retailers worldwide. Lingalaks collaborated with their feed supplier Skretting in order to deliver the differentiated fish to French Supermarché Match and are being rewarded with new and more valid markets for their Salmon properties, Supermarché Match since reported a 12% growth in its salmon category.

I think another enabler is from retailers, to speed up innovation adoption by increasing market awareness. Already Tesco California is stepping up and as the world's third largest retailer, with over 3400 stores worldwide, Tesco's decisions have often helped to influence consumers and other retailers. The introduction of higher salmon standards illustrates the company's ongoing commitment to implementing impactful sustainability measures that help to make healthy sustainable products accessible and affordable to all. With Veramaris' waste-free algal EPA+DHA omega-3 production facility in Blair, Nebraska, USA up and running, Veramaris is ready to support the seafood industry's increasing efforts for improved sustainability and healthy nutrition with its natural marine algae oil rich in the essential omega-3 EPA and DHA fatty acids.

Conservation Perspective

Cristina Torres, Marine Coordinator, WWF Chile.

I want to talk about the way forward for WWF Chile, we focus on 4 areas: protect the oceans, restore the forests, fight climate change, and form sustainable societies

As part of protecting the oceans we also work on management of various species, like sharks and all of this through an integrated approach focusing on achieving outcomes. One of these is that Patagonia is free of an unsustainable industry that threatens the ecosystem and its communities. In terms of our aquaculture work it is about minimising the impacts of the Salmon farming industry. We do this by promoting the adoption of best production practices, through sector certifications. We also push and support the protection of marine

ecosystems in Southern Chile, where aquaculture is very prominent. I think everyone has mentioned the markets that have such a strong impact on the overall production that we tried to use the certification numbers and communicate that how important it is for them to generate this interest for pressure to producers with social and environmental responsibility standards. But this is not enough on its' own. The way forward is to minimise the impacts of salmon farming. It is important for bigger players like retailers to generate interest in alternatives. Sustainability means so much more than certification. There are different platforms to explore and certainly the alternative protein is one of them.

Chilean salmon farming has also become one of the areas for trials to proceed that can provide a lot of different information. It has become sort of allowed to test out different methods so it can provide anything to scale up. What we want to see in Chile is to follow the example of others and we want to see sustainability become a priority, feed is becoming part of the conversation but it's not fully embedded I think.

It is important to note that Chilean Salmon has had an expansion in growth since 1980, it is an incredibly important sector for Patagonia, but is everything working well. Our focus is how can we make it better, we provide guidance on responsible Salmon farming and certainly one of the biggest focus is on sustainable feed and alternative proteins and oils are part of that. The question is though, how can we make scale up and adoption of alternatives as infectious as innovation? This is the gap. It is now in adoption, and how do we get companies to take on the burden of the cost?

If you are thinking about the next 5-10 years, or if we are thinking 30 years we need to be looking at alternatives now. We don't have time to wait, and BAU is not an option. Need to focus on communication and sending out stronger messages.

if we're thinking about 30 years 40 years down the line about how to implement/stop all this we need to have smarter communication - we need to have better communication and I think we need to have this strong commitments and accountability. I think many times industry players and top industry players have made these commitments but we have not been backed up by accountability

Communication is key. I think we need to make it not just setting targets, but linking them to SDGs - I think that's the only way, we need it to make positive change. There is a commitment to growth especially in the southernmost regions. This we don't support at this point without having solved previous issues and on-going issues, for example, the issue we still don't see a greater push for innovation alternative feeds when most of the fisheries are collapsed or over exploited so how can there be a notion of growth. So we're taking a cautionary approach to that point, we hope the companies at an industry level, at this point, marine ingredients are more responsibly sourced and then have a proactive role to play. In keeping sustainability credentials for new feed ingredients and what would that look like? We are engaging with producers, with fishermen, with the fisheries industry as well as land providers, - it would be easier for us to become facilitators of this process if there are mechanisms that we are using, like internal due diligence and this is where we are best to use our expertise. I think we want to promote these changes, and we are most useful in, I think, creating spaces for information to lead to changes in practises. Our focus on innovation: alternative proteins and oil sources- global reach is key. How do we achieve global reach? Better communication and strong commitments and accountability. Promoting alternatives is where we can have most impact.

Round Table Discussion:

Panel Members: Marcela Navarro – CEO, Project X Global, Alex Warrington – Standards Manager (Aquaculture), Soil Association, Aisla Jones – Fish Sustainability Manager, COOP, Mathilde Bussard, Marketing and Communication Manager, Innovafeed, Dr Jeroen Kals - Senior Researcher Seafood, Aquaculture & Fish Nutrition, Wageningen University & Research (WUR). Joined by some of the other speakers.

Congratulations for the previous presentations I really enjoyed each one of your perspectives and thank you for sharing this with us and with the audience. So looking forward to the next phase which is bringing us into more the risk perspectives and value chain perspectives on scale up and risk - probably two of the main themes that we have heard from the presentations before. We are into the world of what can we do differently,

how we can take action, and how we can measure the value of the actions we take. We heard from the previous presentations very interesting positions about this and I'm really keen to move now into our panel. - I'm the CEO of Project X and from a background of the financial sector, Latin, Colombian, and moved into the impact world five years ago. So I absolutely enjoy the value of being in the middle of the intersection between finance and impact and the opportunity we have to execute the opportunity. We have to take action at the speed and in the way the people on the planet needs it. I'm a big fan of execution at a coordinated level. We believe that this is not just one company at a time issue that we can solve and we are absolutely convinced that execution at basis of upscale will help us achieve the objectives of the industry value chains that today represent the biggest opportunity for sustainable sourcing.

The panellists respond to questions and then will take questions from participants.

QU1: **With consumers demanding a strong connexion to the food and transparency and sustainability and where it comes from an aspect is not public, how do you think that can become a positive fundamental Story?**

Aisla, COOP: Feed sustainability is a very difficult topic to communicate to consumers and I think you know sometimes consumers don't have as much understanding of where feed itself comes from so doing another level is quite challenging but We know Co-op members and customers care about responsible sourcing and where their food comes from. Last year at our AGM, 99% of members supported a motion for us to carry on working on responsible sourcing of our food supply chains. There is an expectation from consumers that retailers do the right thing and that the products they buy from us are not associated with negative impacts on the environment or people in the supply chains associated with our products.

We are a member organisation they ask us to carry on working on responsible sourcing which is great - I think customers are starting to understand more about Feed, its been in the media recently with David Attenborough Extinction documentary and Greenpeace soy campaign- people are quite rightly upset when they see negative impacts of food supply chains

When you look at Amazon in this programme specifically calling out soy in animal feed. I thought was pretty interesting, consumers care about some of these producers stories and I think there's some really good examples of where marketing and communication has been used really well to bring out these stories- like for example I think bad trade does a really good job kind of explaining to people the impact people have on the environment.

Positive news stories around food are received well by consumers and there are some fantastic examples of the public engaging with stories and campaigns around the food industry e.g. Fairtrade and plastic. There is real opportunity to create interesting and inspiring positive stories around feed if we do it in the right way!

Jeroen, WUR: Also referring to Cristina, she said about increasing communication and I thought well you can do that with the use of digital platforms where you can make links to all players, actually all stakeholders; with the use of digital platforms we can increase consumer access to information, in principle of the whole supply/value chain. For example we could visualize the value chain by creating direct links between raw material, feed ingredients, feed, fish producers, processors and consumers or in short all stakeholders (e.g. real time monitoring). I think then you can create a real direct way of showing people where things are coming from and that is also interest an so we have the kind of visualisation of the whole process. In addition, with the use of block chain technology you could improve traceability and transparency of the supply chain. The increase of consumer access creates the opportunity to highlight the sustainability of your innovation, raw materials, ingredients, feed, fish product etc. You can see it as a challenge to highlight your sustainability so it's not that you have to tell everything, but it is also giving information but also highlight what you do well and I think people really appreciate that.

Marcela Project X: I would like to add to two main elements where I see contributing to potentially stronger connection with consumers. I think the first area would be simply put; transparency builds trust and trust builds loyalty and loyalty feeds a premium. Hearing Ian talking about what Maché is doing and what other supermarkets are taking the lead on some premium products, I believe as well that feed allows us to have a conversation with consumers. Sometimes we are asking ourselves the question; do we really know what consumers want? Are we assuming what consumers want and we have been hearing from different players,

do we know what they really really want. So I believe that feed has an opportunity to enable the conversation with consumers on supply chain partners about the things that are important to the companies, their values. It doesn't mean it's easy. I agree with Aisla, it is removed from the direct contact with consumers but it is an opportunity to look into the future definitely.

Mathilde, Innovafeed: Consumers actually care about what's in the product and feed is something they want to know about and I do believe that it's important to have a symbol and simple and positive story to tell. Indeed we want to have a positive and simple story to tell about feed. We did this when we launched the insect fed fish label with retailers. When we launched the insect-fed trout we worked very closely with Auchan to define the best way to explain the approach to the end consumers in the most transparent you know way possible and it resulted into two things:

- First we created a specific label "insect-fed fish" and a insectfed.info website so we can make sure that they have all the transparency and very clear information so they enjoyed the experience of this product
- The second thing we did was participating in training 200 fishmongers. We participated in training more than 200 fish mongers at Auchan, who were more than happy to tell the story about their product.

This is the thing to do- is having like clear and transparent information and going beyond, I think that creates a positive story about the team, and the customers. We also want to propose a positive story about more sustainable products to the consumer and alternatives are not in competition. We stated that all these new alternatives exist and that all these innovations should not compete and we are actually answering to the same goal. And this is exactly what we did with our trout value chain, in 2018 and in February 2020 renamed “sustainable value chain”. The whole value chain shared responsible values and so we're really proud to have everyone working together to provide the customer with this positive story.

Harald, Leroy: a bit of a follow up. France is important as a country and has an ability to support alternatives, but the extra cost, who is covering that? We are the first mover on a soldier insect meal and on several feed related issues, but it's very hard to get extra money back and we're running a commercial business so we need the money back. Every quarter we put the results in front of the stock market we get beaten because we have higher production costs compared to those who are not having these costs supporting novel ingredients so the issue is about communication and responsibility, but also for the big retailers to support the return on price.

Harold these days thank you for that comment this raises a question from I guess probably the audience has 2 questions asking

QU2: What is the true cost of transparency?

Harald, Leroy: What is the triple star transparency that you have to establish and maintain such system, which means we have we have a lot of people working all day just to organise only information for every fish we slaughter. This is significant information at the other end, that cost has to be recovered. Secondly, being a first mover, we are establishing systems cost itself. We are told that, probably investors, why bother? No one is paying for this extra information? When for Salmon sold in Norway you desire a tracking number of each package, you can you start tracing the number going to the web and find the full story of every treatment, every feed, every everything on each fish, you are applying it. For every fillet, if you're buying, do the end consumers really care and do they want to pay for it? If they don't care and don't want to pay for it, why bother?

Aisla, COOP: My reflection is in terms of reflective in terms of what do you to try and stimulate some of that kind of interest with your consumers about their willingness to pay.

I think it's a really difficult question. We hear this quite a lot by people that we talk with – “you can have whatever you want in the fish but you are going to have to pay for it” it's not it's not going to go down well that message with them, so we don't pass the cost on. It is difficult especially with people struggling to afford food. There is extra pressure on this conversation right now across the supply chain and collaborating could really help share the cost ingredients coming in. Just to kind of throw another point in, there's also another layer. As a small retailer sourcing from shared supply chains, we don’t think this is a sustainable model and think it

should be shared fairly along the supply chain. This includes workers being treated fairly at the production end of the supply chain- a struggle in some commodity supply chains e.g. tea, coffee, cocoa.

Jeroen, WUR: In my opinion the primary producers, yet this will change towards the consumer, by the use of all kind of government introduced incentives. Though some people say: “Who pays decides”. If this is true than the buyers of (feed) ingredients can make a difference.

QU3: Who should pay for that in the value chain?

Look at all supply chain retailers, where ingredients are very costly, provide ideas of how this can be shared across the supply base rather than passed on the cost to consumers, organic foods may provide insights.

Harald, Leroy: Regarding the price for Salmon- a sustainable organic salmon is some of the worst, really worst, thing you can buy, for sustainability so it's a question about marketing. You give people the impression that organic Salman is a fantastic product, and from an eating quality it might be, from a good feeling point of view, it might be too, but from a sustainability point of view it is not good at all. So I don't really buy the argument that you can't put the cost to the consumer and then continue because you are already doing that on other products.

Aisla, COOP: I agree with you on the marketing side I think that people will pay a bit more but I don't think all of the customers are consumers. I would agree with you and disagree on the point that I can't comment specifically on organic.

Alex, Soil Association: personally I could comment on organic Salmon and I won't get into whether it is truly as terrible as you think it is, obviously I don't think it is, but I do think improvements could be made, clearly on feed, which is part of the reason why we're joining this project. I would say is that a little research has shown currently that it is citizens who are paying the price sustainability. It's not just organic but any kind of product which seems to be in the more sustainable market, the markup is quite often masked between that and the conventional products and I do think it is often more downstream at the retail end. I'm not saying all the retailers are the same or anything, but a lot of research has shown that it is at the retail end, where most of the most of the sustainability gain is and its not as big as the margin is for organics on the end product. I do think that this kind of like accounting logic needs to change and this one where cost is more shared throughout the value chain. Many citizens are willing to pay more for green products (70% willing to pay up to 10% more) if they know the reasons BUT there is a gap between citizens’ intention to act sustainably and the way they shop. The true costs of sustainability arise at the production level – but those steps in the value chain that have the largest impact from a sustainability perspective only contribute a small fraction to total costs. The biggest markups come from steps that have no impact on sustainability. If markups for sustainable production were passed along rather than multiplied, it would put product prices in more tolerable ranges for citizens – the accounting logic needs to change

QU4:Is adoption of alternative ingredients an industry or a regulatory issue?

Joeren, WUR: I hear the struggle of costs. No cost is of course for nothing, you have to pay for this as a consumer and I'm pretty aware that in the end often I buy very cheap products. We can communicate a lot , you can get a lot through marketing, but in the end there is a difference in cost. I think the only way this works is to make it an incentive through policy regulation. I think the example of the implementation of a rule of minimum inclusion levels of certain innovations - referring to the compulsory addition of 10% ethanol to fuel. Why not make a regulation at that for example say now from next year, when it is able to be delivered, it is compulsory to replace at least 10% of your fish oil from an algae based product. This would change the conversation in a completely different way, in the market there is no difference in cost because everybody has to use the same tactics. The competition is not based on the use of ingredients between the different producers instead its on the efficiency of how you market being a valued producer. The initial cost is similar also for the scaling up factor for the innovators, which is necessary. This will stimulate the necessary initial growth and availability of supply as demand is in a way guaranteed. This also creates an opportunity for multiple suppliers. And very important it is stimulated that the innovation will become a future commodity. You have “Fair” pricing incentives that take into account the real costs and CO2 reducing credits (see example

zero emission credits used for electric cars). This creates a level playing field. “Fair” pricing incentives taking into account the real costs (for example real cost of transport in the global economy, might give incentives for more regional/localized production). I don't know if I'm right with this but I think it has a lot of opportunities. In the end you make innovation a commodity so it can compete with all the other ingredients, which are possibly not as sustainable than the one you are trying to implement. Retailers are key. Retailers need to do a better job of making stronger more meaningful claims on packaging sharing with consumers information so they can make choices.

Mathilde, Innovafeed: I see it more as an opportunity to create additional value for a high-demand market:

i. Stake to scaling-up the industry to answer the market needs, and propose sustainable value chains over time.
ii. Labels are also a major stake for the insect industry: need to define what an organic insect is today and define new standards

Alex, Soil Association: both – regulation is moving very slowly, for example processed insect feed is still prohibited under the EU organic regulation, although private organic standard setters such as Naturland have developed their own organic insect feed standards and we are doing the same. The industry really needs to show credible results from in vivo testing to provide assurance to producers that the ingredients are reliable and will ensure their existing production quality is maintained. Evidence of supply also needs to be established, though this is sometimes a chicken & egg situation!

QU5. In terms of the stories you were telling with insect meal and it would be interesting to get your comments on sort of how were you able to carry a greater price with that different insect or was it just the volumes involved? How did consumers respond to the Insect-fed label and did this translate into something, like cost or that they were willing to pay more or were just interested?

Mathilde, Innovafeed: it's very interesting question. The thing is that the insect industry is quite new to the market. It’s recently opening markets so we exist as something new, we need to establish today and it's a major step for the insect industry. We need to work hand in hand with the labels in all countries to define what for instance inorganic insect is actually because we don't we have clear standards established yet to see something we are doing for instance, with a natural process and we then try to accelerate, to speed up this process.

Just to come back to the cost for the whole value chain; sustainability, transparency, food safety and all these topics that really matter to the consumer, should be seen not as a cost. It’s an incredible opportunity to differentiate ourselves and bring value to the value chain. For an equivalent price you can have different return on interests in kind and this is where the competitivity of new feeding ingredients comes into the discussion. New ingredients need to be competitive obviously, this is something the value needs, its a competitive industry. Feed ingredients must demonstrate their competitivity, this can be measured in many different ways, through sustainability or technical and ethical performance. Through this sustainability brings benefits into the value chain through the communication and targeted marketing.

I think this all these become differentiating factors we should be capturing what actually creates an additional value. This is something we demonstrated with the trout fed insect line value chains Auchan launched in 2018 for instance. This product has been launched for two years now and it just demonstrates that we have technical performance, we have an organic performance, meaning that for the final consumer the product is really good and tasty, we had external expert panels tasting the product like insect fed and traditional trout. They made notes, were able to distinguish the two types on 3 out of 26 criteria measured. So these values that brings you innovative ingredients, should be should be captured by all the stakeholders from the value chain.

Marcela, Project X: That's an awesome point about the value of the opportunity. The point about the true cost of low cost ingredients today, are we actually aware of and are we actually mapping the true cost of these.

Harald, Leroy: I totally agree with that question about marketing and we also know that lot of these smaller Scottish salmon farmers which have a high level of EPA DHA in the feed, fish farms are struggling economically at the moment. Just look at it from using microalgae: it is twice the price of fish oil and the process has come down - today we can say it's about 50% more costly than fish oil. Please remember the

carbon footprint of Micro Algae is higher compared to fish oil. So in the one we have a novel feed ingredient, we are using whatever we can in our diet at the same time its carbon footprint print is increased so it's a complex world.

Ian, Veramaris: we actually try to quantify what sustainability means and we run an LCA - what we mean by that is we are not only looking at the climate change impacts like the carbon footprint, but also we're looking at the resources to cushion the impact on land use and help to fight against overfishing. All these elements need to be taken into consideration behind what we what we mean by sustainable

Once you have under your control a process that can deliver a sustainable source of omega-3 and ensure you can start to find other environmental impacts which might be called footprint. Now we've got a situation under our control. We've been able to substantially manage the carbon footprint reduction by making choices in our procurement of energy tariff. For example, in our procurement or other materials process we have a plan in place to become carbon neutral in the future.

QU6. What is your perception on the intangible risks, is risk to enable us to keep moving forward into this adoption at scale for this alternatives?

Marcela Project X: We hear calls from who should assume the costs of the true cost of local ingredients. Are we capturing the value and probably one of the risks that we were looking at ourselves, or starting to attempt to better understand this. The real risk in this whole process is not just about the cost parity or the cost performance, I think we have to have a different sense of risk. You have the tangible risk of life - like the environment, like the LCA impact, but we also have the intangible risks, like the confidence levels. These include the nervousness of switching from one ingredient to another one that includes the vulnerability potentially not knowing if the new alternatives are providing the products at the right level once but after what happens. It's also the loss, the risk of market opportunity lost, meaning not taking an opportunity, but it's also the chaos risk and the lack of decision risk. Allowing the intangible risks, like fear and uncertainty or simply what we call the nervousness, creates an inertia. The existence of nervousness and chaos in a supply chain also means that it is difficult to make optimal decisions at each stage in the supply chain and most importantly in key moments of change.

The 'decision risk' is a critical risk from my perspective. In times of chain we constantly look to bullet proof our decisions ultimately exposing the resilience of the value chain and its future proof performance. The risks of making the wrong or ineffective decisions become the inevitable consequence. So for me it again is intangible risk meaning the fear element the nervous element are one of the few is ordered or the risk that we are not contemplating or quantifying effectively we want to look at these risks.

Harald, Leroy: It's a very important point and we can see that the market price settlement has been decreasing in the last six months but it's important for us that we use data two years from now, as the fish harvested were born two and half years ago. From when the egg is hatched, until the fish is slaughtered it takes 2.5 years, so if we are going to produce a more sustainable fish we have to decide that 2.5 years ahead. On the other hand this Covid 19 situation is giving a real boost for four green companies and we need to ask how can we benefit from this?

Ian, Veramaris: I think you should be careful on watching only on one parameter there are many parameters and I think looking at fish oil compared to the alternative proteins we have completely different scenario. In my opinion for fish oil we don't have enough, but I think we can manage that in other ways but if we can talk about PCBs and dioxins – then these alternatives offer more for food safety too.

Harald, Leroy: There are a lot of sustainability criteria so we have to be careful focusing on just one criteria for what is sustainable or not, but again that is a communication issue. As a fish producer, saying that this fish is very sustainable, but for key players and a project like FEED-X with WWF, to look for this type of fish that fulfils this type of criteria, maybe we will get better results.

Ian, Veramaris: We actually need to think of what sustainability means. This is something that is very frequent like we all try to challenge the same ambition behind the word sustainability and I believe here that Project X effect based approach is really necessary.

Participant Questions

Can consumers see where the fish is coming from? and if not do you think this can be an added value

Lerøy has block chain and full transparency already - but who shall cover the extra cost? We are paying an extra cost for being the first mover - how to get that covered?

I have no doubt that all industries are committed to increasing transparency and sustainability of the sector! However, for the general public/ consumer that are not so clear that effort and the result of that is the (sometimes) negative image that aquaculture still has!

Then when we look to companies certifying aquaculture, well there is an obvious conflict of interests as all certification schemes are very well paid!

Do you think that relying in certifications bodies are the best way to guarantee or better to show the consumer the sustainability of the sector?

Organic salmon is bought by an elite. The question is how we can make a change at scale? So sustainability is not an “elite” benefit but can involve all.

I think when retailers do a better job of making stronger and more meaningful claims on packaging then they arm consumers with the information they need to make choices. Then… they may be willing to pay… when they know what they get in return

Closing remarks by Marcela Navarro, Project X.