The big catch
Consumer centricity in Norway’s seafood industry
Changing consumer demands, increased climate regulatory measures and the Covid-19 pandemic are bringing new realities to the food industry. In the search of products that match their expectations, consumers are challenging the food value chain to deliver not only on a product, but also on their needs.

In the past few years, the seafood industry has seen a rising demand amongst consumers around the world. In June 2020, the United Nations’ Food and Agriculture Organization reported that fish consumption has increased at a higher annual growth rate (3.1%) than other animal protein products (2.1%) from 1961 to 2017 and represents 17% of the animal protein and 7% of the total protein consumed globally. Taking into consideration that a fish’s CO2 footprint (2.5 Kg CO2 per 1 kg fish) is considerably lower than other animal food products, its potential in sustainably feeding an increasing world population is significant.
As an important export sector in Norway, the seafood industry is set to play a key role in the transition to a greener Norwegian economy. Norway needs to create 300 000 new jobs by 2030, in this context Sjømat Norge indicates the potential for the seafood industry to double its value creation by 2030. Despite Covid-19 impact, the industry experienced the highest export volumes in 2020 with 2.7 million tones. However, while the export volume increased, its economic value decreased with 1%. Specifically, the value-growth experienced in the last few years (11.3% CAGR for 2015-2019) in farmed fish will be negatively impacted by the price decrease in 2020 (3% decrease in export value) as a result of Covid-19. Positioning the industry for continued growth and success in the new normal will require new ways of thinking and acting.

In this endeavor, new technologies, like Cloud, Artificial Intelligence (AI), Internet of Things (IoT) and Blockchain provide Norwegian seafood industry with an opportunity. Understanding how these technologies can contribute to delivering on what consumers expect and demand is just the first step into the race. Players who decide to embrace these technologies will be better positioned to outperform industry peers and will claim gains along the way.
Food for thought: Consumer trends and expectations

Understanding consumers’ expectations and preferences and delivering on them will be key to remain relevant and generate future growth. In our work, we have identified four key consumers trends impacting this industry: Conscious Consumption, Food Safety and Nutrition, Convenience and Personalization.
Conscious Consumption

Willingness to buy and consume products that are sustainably produced and treated.
Prior to the pandemic, sustainable products were growing 5.6 times faster than conventionally marketed products and this trend has been further accentuated after March 2020. In addition to climate concerns, animal welfare, preserving the ocean and sustainable production methods, consumers are now more conscious about their communities. Consumers expect sustainably produced products that have a minimum impact on the environment.

- 62% of the Consumers say the pandemic will increase their focus on the environment.
- 72% of the Consumers say that they buy more environmentally-friendly products today than 5 years ago.
- 46% of the Consumers will continue to shop more locally post-outbreak.

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Fish farmers have received criticism in the past because of the extensive use of antibiotics and fish escapes into the fjords. There has been considerable progress when it comes to sustainable farming and this has contributed to salmon being one of the most sustainable and eco-efficient proteins produced. However, there is still room for improvement when delivering on the sustainability challenges facing the industry.

One of the biggest challenges when it comes to sustainability is the high mortality rate. Sea lice and diseases are the key drivers behind it. They are major challenges, both in terms of productivity and animal welfare. Some treatment methods have negative effect on salmon, and other species (cleaner fish). In addition to these major challenges, fish feces and feed-pellets pollute the seawater and seabed. Lastly, further optimization of operations as well as logistics are required to reduce unnecessary costs and minimize transport environmental footprint.
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Land-based production is an alternative solution for reducing environmental impact in the fjords, needs for transportation, among others potential benefits. Even though the technology is developing, there are few attempts to make this harvesting method a feasible one. Atlantic Sapphire is an example of a land-based producer, however the company has recently struggled with profitability and has reported an operating loss of 46,6 M USD in 2020.

Promoters of land-based production argue that there are clear environmental and social benefits to this production method, in addition to short distance to market which is reducing the transportation. However, there are challenges to both technology and biomass growth that will need to be solved before land-based production can match sea harvesting in terms of costs and sustainability.
Another production method on the rise is offshore production. Compared to traditional aquaculture, this is not limited to the fjords, which represents a significant opportunity to increase production. The Norwegian producer SalMar has already applied for permission to start building the first off-shore facility which will increase their production capacity and their ability to treat sea lice and diseases in closed systems.\textsuperscript{19}

Towards the consumer, the industry needs to work on making it easier to get information about the product in a personalized way. This can be delivered in large scale by means of modern technologies. Today, one out of three consumers choose not to buy goods marketed as “sustainable” because they find it difficult to understand the product’s relevance on the issues important to them.\textsuperscript{20} Given the existing controversy around farmed fish, it is likely that having a more consumer centric targeted communication, supported by new technologies, will attract more consumers towards farmed fish products.
Food safety and nutrition

At the wake of Covid-19, consumers want to know that the products they eat are healthy, are produced in a safely manner and contain the necessary nutrients.
In recent years, the increased percentage of vegetable ingredients in fish feed has led to questions about the nutritional value and omega-3 components. It has been reported that the concentration of some types of omega-3 in farmed fish has decreased up to 50% during the last 15 years. This could pose a challenge on how players in the future will obtain the right mix of ingredients that produces the proper level omega-3 required in farmed fish, while delivering on their sustainability commitments. However, studies show that the omega-3 levels today are still high enough for consumers to reach recommended intake. 21

41% of the Consumers only buy from brands they know and trust. 22
74% of the Consumers buy seafood for its omega-3s and 77% value its high protein level and no antibiotics. 23
79% of the Consumers think the pandemic will increase the focus on health. 24

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Regarding food safety, fresh seafood is sensitive to variations in temperatures and this is important through the whole value chain. The brand “Seafood from Norway” is well known around the world and is a representative of trust when it comes to food safety. However, when more sales are done through digital channels, it is important to develop solutions that reassure the consumer that the product is safe through the entire value chain.

At the same time, plant-based food, seen as a meat substitute is growing considerably and is attracting an increasing number of consumers towards vegetable protein food. Leveraging cutting-edge technology, food innovators are delivering on sustainability requirements and are providing the needed nutrients without compromising on taste and texture. Although the focus has been on replacing meat products, it remains to be seen whether and how fast this trend will evolve to other food products, like fish, and what position the industry will take toward these new players.

Increased digital consumption will require an online presence with information about product sustainability and its safety. This will need to be bundled, giving consumers the possibility to trace the fish through the value chain back to its origin. Again, mastering emerging new technologies will be key in enabling such solutions and will increase barriers to compete for those not having the right technological capabilities.
Convenience

Influenced by the likes of Amazon, Alibaba, and other e-commerce players, the consumer today is evermore expecting food to be one click away from their doors.
Physical distancing and lockdown measures imposed by governments during Covid-19 has marked an inflection point for established food producers to engage in Direct-to-Consumer models. While some already are directly offering their products to consumers, others have looked for new ways to partner with the ecosystem. To name a few, well-known food manufactures like Heinz (Heinz to Home), PEPSICO (PantryShop.com and Snacks.com) and Nestle (KitKat Chocolatory) launched their Direct-to-Consumer platforms during 2019 and 2020.27

Players across the seafood value chain have also engaged in Direct-to-Consumer Models. US based Pacific Seafood launched an online store that offers a wide diversity of seafood products, including farmed fish. The site works as any other retailing online store, i.e. offering discounts to early birds, and will soon be offering the possibility to customize orders. True World Group, another US based player, is selling directly in their website and with next-day delivery three times a week in selected city areas.28

Although there are some companies partnering with local food delivery businesses like Oda.com29 and Amazon Fresh30, we do not see a considerable activity around Direct-to-Consumer models for more established Norwegian companies. This will be a necessary step to get access to consumer data to improve and personalize product experiences.
The era of “one size fits all” is over. Consumers look for products and services that cater for their specific individual, environmental and ethical preferences, and physical needs.
While innovators and start-ups are driving these new business models, more established companies have joined the race in the last years and have set high growth expectations for this market. It is projected that just the personalized nutrition market will grow from 8,2 Bn USD in 2020 to 16,4 Bn in 2025.31

The range of services and products catering for consumers’ needs is extensive. A few examples include UK based Blue Apron and Norwegian Godt Levert, who make it easier for those with a hectic lifestyle to get a ready-to-cook meal and thus saving time planning shopping trips and recipes. Drinkable meals from Soylent save the time we spend eating food, and it does it with more sustainable and nutritious ingredients. US based Jerky Perky is launching a new concept, which includes transitioning to healthier snacks (and just as tasty) and linking it to a purpose (donating part of their profits to charity).
In Norway, several players are delivering more personalized experiences, also within the fish value chain. For example, fish farmer and producer Lerøy is focusing on delivering products for those “på farten” (as they go) and “rett i ovnen” (ready-to-heat). Healthy and filling meals in the form of poké bowls and sushi as well as more elaborated fish dishes are available in grocery and retailer’s online stores for those with hectic routines.

Given the nutrients and proteins content, coupled with the taste and freshness of fish products and sub-products, seafood industry players should get more actively involved in exploring and delivering on this segment. A common trait of these innovators and disruptors is the use of technology and data to better understand consumers and their needs.

Therefore, mastering core and emerging technologies as well as a shift in mindset will be a key to understand consumers and deliver on their expectations.
The recipe for success: Apply technology and data to deliver on consumer expectations.
Delivering on consumer expectations requires that seafood producers have a more holistic view to technology and data. As we have examined, consumers are expecting top quality sustainable products delivered to their doors, and if possible, with a personal stamp on it. How can the industry provide consumers with end-to-end visibility and transparency, share data across supply chain to optimize operations, get access to consumer data to understand consumers’ preferences and use it to generate growth? In our work we have identified four key technologies (Fig 1) that leading players are using to answer this and other questions.
To quote some local examples, Norwegian Mowi is collaborating with Alphabet and their artificial intelligence-technology\textsuperscript{33} to increase efficiency, improve fish health performance and reduce mortality. Similar work is being done by Norwegian Royal Salmon with ABB and Microsoft.\textsuperscript{34} It is expected that the result of this collaboration yields a more sustainable production process by decreasing mortality rate of fish, improve feed-conversion ratio and the fish’s nutrition.

Kvarøy is using IBM’s food trust platform to give all members of the value chain, including consumers, access to comprehensive product data in near real-time. It provides the provenance of the fish and which feed it was raised on.\textsuperscript{35} This gives complete transparency for the consumer, making it easier to take sustainable choices when buying.

Internet of Things (IoT) is combined with Artificial Intelligence and used in production facilities, and through the value chain, to register products movement and temperatures during travel. Mowi has partnered with Evrythng and is using IoT-technology to make its products provenance available for consumers in an interactive way.\textsuperscript{36}
As underlying technology, Cloud makes it possible to track all the data in real time, from the widely distributed production facilities and through the whole value chain, while also allowing for flexible scaling of new solutions and more efficient operations. As an example, The Seafood Innovation Cluster has partnered with IBM and together they are working on building a solution that allows farmers to share data on lice to accurately forecast outbreaks and plan interventions, which will reduce fish mortality rate. On another note, Mowi and Salmar has contracted Oracle cloud logistic solutions to have better visibility and control over costs, and to make operations more efficient.

While the Norwegian seafood industry is taking initial, but firm steps to apply New Technologies in the harvesting, production and distribution process, its full potential and use is yet to be fully leveraged. Preparing for the future requires a full understanding and adoption of these technologies to further optimize operations and provide consumers with product transparency. This will also contribute to delivering a more personalized experience, especially those engaged in value added processing.
Top of the food chain: 5 recommendations for the seafood industry’s future

1. **Continue to focus on sustainability and ensure that consumers are informed in a personalized way.**
   - Develop solutions that reassure consumers about the safety and nutrition of each individual fish. Address the potential fish substitutes that may emerge from plant-based production as well as the opportunities arising from alternative production methods.

2. **Develop solutions that reassure consumers about the safety and nutrition of each individual fish.**
   - Understand the impact that Direct-to-Consumers models have on the industry and embrace it. This requires new ways of thinking and will demand exploring partnerships with ecosystems players to bring about innovative, customer centric solutions with digital at the core.

3. **Understand the impact that Direct-to-Consumers models have on the industry and embrace it.**
   - Acknowledge that personalization of food is a reality. Consumers will continue to demand personalized experiences - seafood products are not an exception. Ease of access to consumer data and the technological power to process it will determine, to a great extent, the degree of success in generating new growth streams.

4. **Acknowledge that personalization of food is a reality.**
   - Become digital at the core and ensure that data is used and shared across the whole enterprise to deliver on sustainability, generate growth and improve profitability. This will require an entrepreneurial mindset and having the right ecosystem partners to realize the journey. Those that will harness today’s digital imperatives, will be the winners of tomorrow.
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Thanks

The authors would like to thank Kristin Langeland (Sjømat Norge), Robert Eriksson (Sjømatbedriftene) and Lars Moksness (Norges Sjømatråd), for interesting discussions and input during the research process.
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