

MARKET COMMENTARY

Is Salmon the Protein of the Future?

The Investment Team at Blackcrane Capital evaluates the growing global demand for salmon and two European companies that are emerging as aquaculture standouts.

By the year 2050, the UN forecasts that the world's population will reach 9.8 billion. Assuming dietary consumption levels remain consistent, this population growth will require a 40% increase in the global supply of protein. How in the world will we come up with all of this extra meat?

In this commentary, we look at why today's most innovative salmon producers may offer our best hope for meeting the growing global demand for protein.

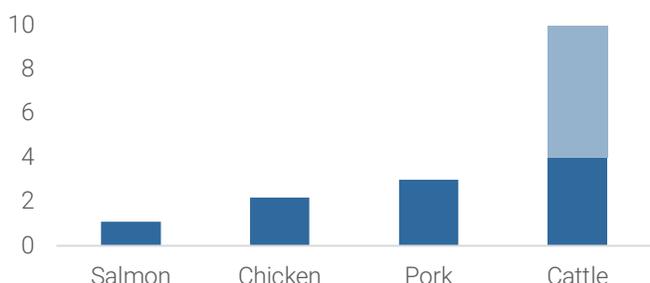
Finding Amino – A New Fish Story

By the year 2050, the UN forecasts that the world’s population will reach 9.8 billion, up from 7.6 billion in 2017.¹ Assuming dietary consumption levels remain relatively consistent, this population growth will require a 40% increase in the global supply of protein. If you take into account today’s keto-obsessed dietary culture, along with the notion that protein consumption typically rises with incomes, there is probably more upside to this demand. So, how will the world come up with all of this extra meat?

Many factors suggest that fish—and salmon in particular—could be our best hope as we try to meet our future global protein needs.

Other than the nutritional benefits, such as omega oils, vitamins and other minerals, the most important underlying driver is, as always, economics. In a nutshell, fish need less food than other animals to put on the same amount of body mass. To increase the body mass of a chicken by 1 kg, you would need to feed it 2.2 kg of feed.² Pork is even higher at 3 kg, and cattle require a staggering 4 to 10 kg! A salmon, on the other hand, only requires an incredibly efficient 1.1 kg of feed to increase its body mass by 1 kg.

Feed Conversion Ratios Across Protein Sources (kg)



Source: Marine Harvest (2018)

We can also look at the percentage of each animal’s body mass that is actually edible. For cattle, pork, and chicken, this proportion ranges between 41% and 46%. Meanwhile, even if you were to (regrettably) toss the tasty head, you could still eat roughly 68% of an average-sized salmon.³ Lastly, humans retain more protein in their own bodies after consuming salmon—31%—than they do from consuming chicken, pork and beef proteins, which leave 21%, 18% and 15%, respectively.⁴

Of course, people have already caught on. There are essentially no remaining locations in the world that could accommodate any notable build out of new aquatic salmon farms. Indeed, for salmon to grow and flourish in farms, sea water temperatures should ideally be in the range of 8°C to 14°C.⁵ Further, the fish need geological structures such as fjords to protect them from the open ocean’s strong currents. These prerequisites eliminate the vast majority of Earth’s surface, except for fortuitous areas in Norway and Chile, which as of 2012, respectively made up more than 50% and 30% of the world’s aquatic salmon production.⁶

¹ United Nations, Department of Economic and Social Affairs, Population Division (2017). World Population Prospects: The 2017 Revision, Key Findings and Advance Tables. Working Paper No. ESA/P/WP/248.

² Salmon Farming Industry Handbook 2018, Marine Harvest (2018).

³ Ibid.

⁴ Ibid.

⁵ Ibid.

⁶ Asche, Frank & H. Roll, Kristin & Sandvold, Hilde & Sørvig, Arne & Zhang, Dengjun. (2013). Salmon aquaculture: larger companies and increased production. Aquaculture Economics & Management.

What about the iconic wild-caught salmon we are lucky enough to enjoy in the Pacific Northwest? While today's supply might be adequate for occasional fine dining, the volume of salmon caught in the wild has been stagnant for the better part of the past decade. Unless we want to explain to our grandchildren why we ate these wild fish into extinction, sourcing salmon from the open waters alone won't be a viable option for our growing worldwide populations. Indeed, farmed salmon now represent 73% of the global supply, and without continued growth in commercial aquaculture, protein affordability at large will surely worsen.⁷

The sustainability of our global aquaculture industry—and of livestock-related agriculture more generally—is an extensive topic best saved for another discussion, yet the environmental risks related to farm-raised salmon are worth noting here nonetheless. The primary limiting factor for these high-density farms is biological sustainability. Nature does not allow salmon to be grown in high densities without causing outbreaks of parasites known as sea lice and other biological health issues that limit fish growth. If these outbreaks are not managed carefully, entire harvests can be subject to failure. To get a sense of how serious this is, take Chile for example. Though there are approximately 1,320 licenses approved by the Chilean government, only between 300-350 of these licenses are operating in the country.⁸ The producers who can combat these sustainability issues successfully will be best positioned to meet future demand.

An Industry in Transformation

Historically, before top-producing countries tightened their regulations, salmon farming had been a somewhat cyclical industry, with three-year boom-and-bust cycles tied to the impact of natural conditions on supply growth. When natural conditions were just right, supply growth boomed, creating an oversupply. In other less favorable conditions, supply was much tighter, leading to sharp increases in pricing. During this time, a larger number of bad actors also used substandard farming methods, such as those used in feeding. The gold standard, in this case, would be to introduce food pellets from the bottom of the pens upwards, via an underwater tube. The cheaper method is, of course, to dump the feed into the pen from the water's surface. This latter practice can lead to algae blooms that trigger more diseases and biohazardous consequences.

In recent years, the Chilean and Norwegian regulatory bodies have tightened their rules, creating a much more stable environment in which the volume of growth can be more easily controlled. We believe that these new constraints will naturally lead to fewer biohazardous risks coupled with steadier volume growth—a win-win scenario for the industry. Spot commodity prices should also sustain elevated levels in what the industry will likely recognize as a super-cycle in the upcoming years.

Investment Opportunities

Although the industry as a whole should benefit from the several long-term structural drivers mentioned above, investments in two idiosyncratic winners should perform significantly better in both the medium and long term.

MOWI (Marine Harvest Group): Bigger is Better

As the industry continues into its next stage of growth, the physical and biological constraints mentioned above will favor the larger players at the expense of the smaller, mom-and-pop operators.

⁷ Salmon Farming Industry Handbook 2018, Marine Harvest (2018).

⁸ Ibid.

More than anything, investments into state-of-the-art technology to automate, optimize, and combat issues such as sea lice will become a necessity of survival. One example is a company's capital expenditure to acquire a service vessel that can automatically harvest and process upwards of 100 tons of fish in the span of just one hour. This volume is simply not possible for small and even mid-sized operators and could put pressure on the already widening operating margin gap.

Due to its sheer scale, Mowi has recently been able to ramp up development of its own feed operations. It now supplies over 99.4% of all of its operations within Norway and will imminently replicate this capability in its production facilities in Scotland as well.⁹ Rather than purchasing a "one-size-fits-all" feed from an external provider, Mowi can now customize its internal captive feed on a farm-by-farm basis on attributes such as omega-3 target levels or geographically optimized levels of proteins and minerals. This is a unique competitive edge that will further advance Mowi's lead over its competition for years to come, and this is just the beginning.

Also, Mowi is in the midst of a five-year initiative, started in 2015, to invest €50 million every year to significantly advance its land-based farming operations. At least a portion of all salmon farms are operated onshore, which includes the hatching of eggs up to the freshwater smolt phase. Generally, the smolt are grown to roughly 100-120 grams before they are released into netted ocean water pens to continue growing.¹⁰ However, Mowi is targeting onshore growth to 160-200 grams by investing in enormous tanks that can support these larger fish. Although more difficult to pull off, introducing a much larger smolt into the netted ocean water pens significantly reduces mortality and improves resilience to biohazards such as sea lice.

Lastly, Mowi continues to reinvest vertically into a full-on downstream distribution business, allowing the company to capture additional margin and control more of its end markets. This advantage will only increase as time passes and the market further consolidates.

Looking at Mowi's market consensus estimates, analysts are essentially incorporating a flat spot price of NOK 60/kg (approximately US\$7/kg) for the foreseeable future. A historical, seasonal regression would suggest 10-15% higher pricing in 2019 and 2020. Using a 10% higher assumption of NOK 66/kg for 2019, this would translate to 23% earnings upside, without incorporating all of the cost/margin benefits mentioned above.

There are several sources of additional topline upside that are not yet incorporated into the already above consensus calculation above. One of the most exciting drivers is a likely meaningful near-term surge of activities in North America. In recent years, Mowi has been aggressively rolling out its initiative of distributing freshly prepacked salmon directly via retail stores, which has been extremely popular among consumers seeking alternatives to massive whole and/or frozen salmon. When this same strategy was introduced in Germany in 2012, the volume of freshly packaged salmon jumped from approximately 2,000 tons to 14,000 tons today.¹¹

It seems we are just now hitting the inflection point for Mowi in the United States. Towards the latter half of January, the company opened up a massive new distribution facility in Miami that processes roughly 3X the volumes of its existing location in Dallas. This will certainly buck the normal seasonal trend in a market representing just under 10% of Mowi's total revenues.

⁹ Mowi, Q4/2018 Quarterly Report

¹⁰ Salmon Farming Industry Handbook 2018, Marine Harvest (2018).

¹¹ Arctic Securities

Over the longer term, China will become the next big growth market. Per capita salmon consumption in China today stands at a modest 0.1 kg/year.¹² One of the major limiting factors had been a strained commercial trade relationship between Norway and China. In 2017, these tensions were calmed, catalyzing significant commercial activity between the two countries. The build out of distribution and additional market development will of course take time, but even an increase of consumption to 0.5 kg/year (in line with Russia and Japan, but well below US and Europe) over the next 5-10 years would mean a 20-25% increase in incremental global demand. Further, even if US-China trade tensions on items like soybeans subside, it is likely in the interest of the Communist Party to sustain as many self-sufficient sources of soft commodities and other food sources for its nation. As a side note, roughly 85% of the feed that is used to raise salmon comes from plant-based sources, predominantly soy beans. Lastly, if Russia decides to lift the self-destructive ban on Norwegian fish imports at any point in the long-term future, the glory days would only be yet to come.

Atlantic Sapphire: The Sleeping Giant

This is a company that will eventually disrupt the salmon farming industry. After nearly a decade of continuous trial and error, testing and analytics, optimization, and innovation, Atlantic Sapphire has achieved the unachievable in developing an end-to-end solution to produce salmon completely onshore in a highly lucrative manner.

Shipping and logistics are among the biggest cost factors in the salmon business. Because aquatic farms are geographically localized in Norway and Chile, this significantly increases costs to ship salmon to countries like the United States—roughly NOK 15/kg in additional expenses. Roughly speaking, the US spot price for European fish is then NOK60/kg (today's approximate European spot price) plus NOK 15/kg in logistics costs, equaling NOK75/kg. The difference flows directly through Atlantic Sapphire's P&L.

Atlantic Sapphire has discovered the perfect production site for its "Bluehouse" operations in Homestead, Florida. This production site will eventually allow the company to bypass the time and expenses involved in shipping their European product to the US. The company's trademarked "Bluehouse" methods, now operational at its Denmark facility, also adds up to four days of additional shelf life, which would greatly expand the types of freshly packaged products that can be merchandized at retail outlets across America. Examples of these new product categories include super fresh and sashimi raw products, fresh salmon filets packed to individual specifications, and smoked salmon in different packages and sizes.

There are several other advantages that a fully land-based salmon farm has over traditional aquatic farms. First, superior biological conditions are made possible through the completely controlled environment that circumvents the unexpected variables found in traditional farms. The single biggest positive is the absence of parasites such as the dreaded sea lice. Overall, according to Arctic Securities, the average global mortality rate for traditional farms generally ranges from 17-20% vs. just 1% or less for Atlantic Sapphire's land-based system. Not to mention, the quality of meat is second to none. Atlantic Sapphire's salmon is sold at roughly a 30-40% premium and featured by Michelin-starred chefs and restaurants due to its quality.

The three critical requirements in any land-based farm include 1) easy access to fresh water, 2) easy access to salt water, and 3) a feasible and economically viable method to dispose of the huge waste byproduct of running large-scale aquatic farms. Not only is it expensive, but there are obvious

¹² Grieg Seafood CMD 2018, Arctic Securities
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environmental concerns that cannot be ignored. Amazingly, it turns out that South Florida has the perfect geological structure to support all three of the elements mentioned above.

By drilling approximately 200-300 feet through the surface at Atlantic Sapphire's site in Homestead, the company has abundant access to fresh water. This aquifer system is one of the world's most productive and supplies drinking water for nearly 10 million people. This zone is separated by a thick layer of carbonite rock. By drilling through this layer approximately 1,000 feet, the company can access biosecure salt water, which is several thousand years old. Finally, by drilling through an additional 1,000-foot-thick rock layer, they may access the Boulder Zone for treated water disposal. The Boulder Zone offers the company unique water disposal rights for spill water. The company's discharge permit (20m gallons of water per day) has been secured for the targeted 90,000 tons of harvest in 2026.

After several hundred years, natural processes convert and release this material into the Gulf of Mexico as purified water. The best part is that Atlantic Sapphire has patented this unique process and has protection for the next 20 years. To our knowledge, there are no other viable sites in the world that come close to the natural geological conditions of South Florida. With a virtually insurmountable barrier to entry, Atlantic Sapphire has a wide-open playing field to execute its plans.

Separated into three phases, the company plans to reach a production capacity of nearly 90,000 tons of salmon per year in its Florida facility by the year 2026. When this is achieved, the company will generate approximately US\$440m in EBITDA. At its current price, you will be paying a valuation equivalent to roughly 0.9X EBITDA for a structurally disruptive, economically insensitive, triple-digit-earnings CAGR grower with bulletproof barriers to entry. The company has already successfully built this system in its Denmark facility, so all it needs to do is complete building out a virtual replica in Homestead. The facility in Homestead is rapidly underway with the completion of egg hatching and smolt phases and a targeted first harvest in August 2020. With its recently confirmed debt facility backed by DNB and the Danish government, cash flow shortfall risk has effectively been reduced to immaterial levels.

Interestingly, there are more idiosyncratic sources of upside even beyond these budgeted forecasts. For one, in reality, Atlantic Sapphire's mortality rates aren't even close to the 1%, but rather in the 0.3-0.5% range—maybe a poor fish unluckily managed to jump out of the tanks? Second, the feed required to grow biomass by 1 kg looks more like 1.05 kg instead of the budgeted 1.1 kg. While .05kg of food doesn't seem huge, a 4.5% reduction in your main input cost is meaningful. Third, the company's budgeted plan incorporates a one-year pause in between each phase. If there are no major issues or problems with the construction of the facility and roll out, there is little reason why the company would want to remove all of its construction equipment and contractors, only to rehire and move everything back after a year-long hiatus.

We see the biggest long-term upside in the scalability of the production facility. In fact, after personally visiting Atlantic Sapphire's facility in Homestead last month, it is worth noting that the site is literally surrounded by farms and agricultural land, making a second facility tantalizingly ripe for the picking. So instead of a 90,000-ton capacity, why not 180,000 tons in the next phase of development? What else should the company do with all the free cash flow it will be swimming in at that point? The US Atlantic salmon market is set to grow by approximately 500,000 tons over the next nine years;¹³ according to current forecasts, the entire salmon industry at maximum output can only supply about 150,000 tons.¹⁴ Even if Atlantic Sapphire doubles or triples its expansion plans, the US should be able to absorb this additional volume without causing much instability to the existing industry dynamics.

¹³ Atlantic Sapphire, Investor Presentation April 2018

¹⁴ Arctic Securities, Kontali

Conclusion

The world's hunger for protein will be a relatively certain and lasting challenge in the years to come, and we believe that the industries that step up to meet the world's demand will be rewarded handsomely. Indeed, unless bacon cheeseburgers turn out to be the next cure for cancer, the salmon aquaculture sector should enjoy a particularly sound structural position over the next decade. Still, the rising tide will not lift all fish; instead, the larger and/or more innovative players like Mowi and Atlantic Sapphire will likely enjoy a bigger share of the industry's potential gains. We hope, at the very least, that holding these companies will help us to hedge our own salmon cravings. For everyone else, please proceed with caution and resist the temptation of betting the fish farm without a healthy dose of independent diligence.



ABOUT BLACKCRANE

Founded in 2012, Blackcrane Capital is a boutique asset management firm focused on global and international equities, based in Bellevue, Washington. Blackcrane manages approximately USD 727.9 million in AUM (March 31, 2019).

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