

Market Hunt S02 EP11 - Aquabounty - Sylvia Wulf

[Begin intro music]

Hi folks, Thierry here. This Market Hunt episode will feature a company called [Aquabounty](#) hunting for consumers to buy its product. Seems pretty straightforward right? Well it's not so simple... For starters the company must go through third party distributors to get their product to consumers. Nothing groundbreaking here so far. But the kicker: they are attempting to sell [the first ever genetically modified protein approved for human consumption: a genetically modified Salmon.](#)

Now remember, this episode is part two of our aquaculture series. I strongly suggest to check out [the previous episode with Aquaculture expert Professor Rich Moccia](#) to get some context on Aquabounty and on the aquaculture industry. You'll learn about the 25 year regulatory approvals process they went through to get their product to your table as well as the plethora of innovations taking place in the industry.

Plant based genetically modified foods have been around for years in products [such as soy, corn and zucchinis](#). Of course we know there has been fierce debate for and against GMOs and we are not here to pick sides. We'll post [a few links up on our episode page](#) if you are interested in that debate.

Our objective is to understand the Aquabounty business case of bringing a product to market, despite strong resistance from certain consumer groups. I hope you enjoy these episodes for the learning opportunity they can provide for business leaders, students and anyone interested in innovative technologies and how they get commercialized. Whatever side of the GMO debate you might be on, there's much knowledge to gain here and we are humbled by the opportunity to bring it to you.

So are you ready? Let's go.

[Begin theme song music]

Nick Quain: Entrepreneurship is hard, you need to have support there.

Andrew Casey: We fundamentally have to learn how to live our lives differently. We can't keep going the way we have.

Handol Kim: It's not like Google can come and move in and take the entire market. Not yet, right?

Thierry Harris: It's a real balancing act which requires a bit of insanity frankly. But I mean some people are into that stuff I guess.

Handol Kim: You know the size of the market, that's really all you've got.

Thierry Harris: We're coming up with some pretty interesting ideas here.

Andrew Casey: We've solved everything,

Thierry Harris: [chuckles] We've solved it all.

[End theme song music]

[Begin promo music]

Narration: And now a message from our sponsor, [IE-KnowledgeHub](#). IE-KnowledgeHub is a website dedicated to promoting learning and exchanges on international entrepreneurship. [Watch Video Case Studies](#), [listen to podcasts](#) and much more!

le-KnowledgeHub focuses on innovation ecosystems and firms who commercialize their technologies in international markets.

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Let's listen in to [a Video Case Study featuring Bonlook](#).

[Sophie Boulanger:](#) *There's no reason why glasses should cost as much as an iphone. it's outrageous.*

Narration: *That's Sophie Boulanger, co-founder and President of [Bonlook](#), a prescription eyewear company based out of Montreal. Bonlook designs, manufactures and sells prescription eyewear online and in stores. Sophie explains how she got the idea.*

Sophie Boulanger: *The idea is really to deliver people from expensive eyewear basically but not cutting down on the quality. We cut down on the intermediaries and the middle-men. You can shop by shape category or color, you can try on the frames with the webcam which is a pretty cool little app that we have. We've done red frames, purple frames, mint, clear with gold inside. it's all about having fun with your eyewear and expressing your style and your individuality.*

Narration: *Bonlook is banking on the price quality ratio of their attractive eyewear to draw people into buying more than one pair.*

Sophie Boulanger: *I would compare our product to what is typically sold from 350-400 bucks to 600 bucks at regular optical stores. I mean I visit the factories a lot and I see all those big brand names that are manufactured in the exactly the same factories as us. And it's astounding when I compare how much these frames are sold for and how much my frames are sold for. So by introducing great quality glasses at a fraction of the price, it really changes the relationship that the client has with their eyeglasses.*

Narration: *Listen to more on Bonlook's evolving business model at the end of the program. You can also checkout the [Bonlook Video Case Study on le-KnowledgeHub](#) by visiting [le hyphen KnowledgeHub dot Ca](#). And now, back to the show.*

[End promo music]

[Begin intro music]

Thierry Harris: [Product market acceptance](#) can dictate the rise and fall of companies. Innovation, to be successful, must be [able to solve real or perceived problems for consumers](#). Changing [consumer habits can take years before mainstream adoption](#) and often need an inflection point for example the [pandemic on home food delivery apps](#) to bring them over the top.

[Aquaculture](#), the farming of aquatic organisms purely for human consumption [claims to provide a sustainable alternative to wild caught fish](#). Some people care if their fish are wild caught, others don't. Consumer perceptions are constantly changing. And make no mistake this case is all about consumer perceptions.

[Sylvia Wulf](#) is President & CEO of [Aquabounty](#). Aquabounty is a publicly traded aquaculture company based in the U.S. Wulf came to the company in January 2019 after a long career in consumer products, food and distribution. She was hired as the company was preparing to make their product, a genetically modified farmed Salmon named [AquAdvantage](#), available to markets in North America.

Wulf will discuss Aquabounty's journey of commercializing the first genetically modified protein approved for human consumption in the world.

Let's begin.

Sylvia Wulf: I think the most important thing to know about AquaBounty is we are bringing the first genetically engineered food, a protein to market for consumers, for human consumption. We've been approved by both [Health Canada](#) and [the FDA](#) to raise and market our AquAdvantage salmon.

[music interlude]

I'm a big believer in innovation with a purpose, which I believe that AquaBounty provides. I also want to be able to deliver a sustainable alternative. I know we talk a lot about sustainability, but I've been involved in thinking through exactly what sustainability can look like and the way that it can positively impact the planet.

[music interlude]

Thierry Harris: Aquabounty describes itself as a 30 year old startup. Their technology was developed at [Memorial University](#) in Newfoundland & Labrador in 1989, but was only approved for consumer consumption in 2015. Fish farming has changed a lot since then. Aquabounty uses [re-circulation technology](#) in their land based farming facilities to harvest the fish. Wulf elaborates:

[music interlude]

Sylvia Wulf: I think that the way that we're raising the fish is actually perfect for the times that we live in. What's happening today is land-based farming is becoming more and more interesting and commercially viable. Our salmon are actually farmed in a land-based tank farm. If you think about it, it's really a large water management facility that has fish in tanks within it.

The fish are grown from [eye to egg to maturity](#) in approximately 18 to 20 months. The benefit of that is the fish are protected because it's a bio-secure environment, so they're not exposed to disease or predators or climatic conditions. We're not impacting the ocean, which the traditional method of farming is [net pens](#). And we believe that this is an opportunity for rural development because anywhere that there is

access to quality and quantity of groundwater, we can place one of our farms.

Thierry Harris: You're literally bringing these proteins that aren't traditionally grown, for example, in the Midwest or anywhere where there's not access to oceans. You're having it so that it is closer to the consumer, there is less travel distance between the areas of production, and then the areas of distribution, and then the areas of consumption. You're saying that it's a safe way, so these fish have nothing else in them, except for their genetically modified genes, which have been ongoing for the last 30 years, essentially. Is that the case?

Sylvia Wulf: I think you've described it very well. We recirculate 97% of the water. We can place the farms anywhere where we have access to good groundwater. That's to me is a sustainable approach. By placing them away from the oceans gives us lots of opportunity to potentially partner with other forms of agriculture and utilize all our waste streams. We're not flying our fish from Norway to different places in the world.

Canada has been in the salmon-farming business as a country for a long time, but is more and more concerned about the impact to the ocean. This is a viable way of farming for the future in North America and around the world.

[Music interlude]

Thierry Harris: What's different about the way that you're farming it versus some of the other ways of farming in the general ecosystem?

Sylvia Wulf: I think the big difference between traditional farming and the way that we farmed fish is traditional farming, for salmon specifically, is done in large net pens in the ocean. As I said, those fish are now subject to disease, predators, things like sea lice and in climatic conditions. If you think about the warming of the oceans or super chills, those affect the fish in those large ocean pens that are typically off the coastal areas where there's very, very cold water.

Having those fish at a very concentrated area can also create some environmental challenges with the way it streams. I'm not sure that they've always received the approval of consumers, but I know that there's a lot of work being done looking at how to protect the fish more robustly, how to make sure that they are protected from the environment and not needing to use things like antibiotics. That's the traditional method of farming.

Ours are in a land-based completely enclosed tank farm. These facilities are bio-secure. We have six levels of physical containment to protect both the fish and the environment. So unless the fish can grow legs, wings, and walk through all the six levels of containment, they're not going to leave the facility on their own. It's just a very different method using our resources in an environmentally sustainable way.

[Music interlude]

Recirculating aquaculture systems have been used for other species like tilapia and others, but salmon because they have a very long life cycle from egg to harvest and they are very, as I said, finicky to their environment. Salmon farming in this environment is a relatively new phenomenon, but AquaBounty, because we've had to maintain our brood stock- the mothers and fathers of our fish for 25 years, has really developed what I would consider to be a skill set that's unmatched in the world in terms of how to raise fish in that environment safely and effectively.

[Music interlude]

Thierry Harris: Tell me, what is the fundamental ideation behind doing something like this? Why are we, as a society, interested in having, for example, farm-based fish versus wild fish? What's the big problem that we're attempting to solve over here that AquaBounty is attempting to tackle?

Sylvia Wulf: I think it's twofold. The genetic modification allows our salmon to grow faster. What that provides is better utilization of resources because you're cutting down the time necessary to bring the salmon to market. That allows us to produce more fish, feed more people a healthy protein.

The second attribute of the genetic modification is feed conversion ratio. There's quite [a bit of discussion about how much feed does it take to bring X amount of pounds](#) to market. Fish typically are one of the best in terms of feed conversion. It's almost one to one, but our salmon are actually incredibly efficient about utilizing their feed, so you're getting for a pound of product, you're having to use less than a pound of feed, which means your utilization of your natural resource is--there's an advantage there.

Then when you think about transportation, etc. what this type of farming, it allows production close to consumption. I think as we've all experienced during the pandemic, food security is critically important. Having the ability to produce salmon close to consumption is to some degree a food security issue and that supply chain is absolutely critical.

Thierry Harris: Ok so those are some of the points that you've made with regards to the reasoning behind investing into this technology and also developing this technology as a consumer product relating to the sustainability of it. Very interesting point in terms of the protein in versus output out with the feed that goes into them. How are these fish classified? Why are they a safer, cheaper alternative?

[music interlude]

Sylvia Wulf: All of us are concerned about the impact on our oceans and our wild fish. Globally, we've implemented quotas for wild-caught fish like salmon to protect the population. You don't want to overfish. And so they're seasonal, there's limits in terms of how much you can catch. The

alternative is to farm that salmon. As I said, the methodology for that is right now ocean pens.

What this does is allow us another form of farming. You asked about how that's communicated to consumers. Typically, you'll see farm-raised or you'll see wild-caught on the label. Canada doesn't specifically require the genetic modification be identified on the label. The reason for that is actually, I think, very progressive. Because of all of the regulatory approval and testing that was done, Health Canada says that it's an Atlantic salmon like any other Atlantic salmon.

It's identical except for that gene, so there's really no food safety issue. Because it's identical, why do we need to call out genetically-engineered? In the United States, it's a little bit different. We actually have [labeling requirements that will cause us to include on the label a bio-engineered food](#). We are proud of what we've done from a research standpoint.

The food is safe. It's healthy. It's closed naturally and brought up in a contained environment, so there's no environmental impact other than a positive one. We think the consumers once they understand the story, it's going to resonate with them and that it is another way to bring a healthy protein, like salmon, to market.

Thierry Harris: Just to be clear, there is no antibiotics or anything that's going into the farming process. Is that correct?

Sylvia Wulf: That's correct. Our salmon are raised without antibiotics. It's a highly bio-secure environment, so they're not exposed to disease or anything like that. Which allows us to bring them to market without having to treat them for anything with antibiotics.

[music interlude]

Thierry Harris: Thank you for clarifying those points because I think that that's maybe one of the obstacles that AquaBounty might have had to overcome is just clarifying that message. Tell us a little bit about the, some of the challenges that AquaBounty has faced and how have you overcome those challenges?

Sylvia Wulf: I think we continue to see challenges, and I think it's a matter of consumer education. I think that once they understand the story of why we made that genetic modification to protect that vision in its early stages, which enables our ability to produce differently in a land-based farm and that it has gone through rigorous testing, it's food-safe. They find it to be a very attractive proposition because the attributes the consumers are looking for are really affordability, accessibility, and taste.

We can deliver on all three of those consumer desires. When we tell that story simply consumers are like, "Well, where can I buy it?" Now, we do [have opposition](#). [There's a lot of discussion around anti-GMO](#). Typically,

this is about the environment and that means what happens if the fish escape and mate with the wild population?

Thierry Harris: Yes.

Sylvia Wulf: Well, the first answer to that is we take environmental sustainability very, very seriously. Those bio-secure environments with six levels of containment protect the environment. We build our farms where there are not even close to any type of salmon. Thirdly, the eggs that we bring into our facility are sterile females. If there should be, let's just say, somebody took an egg and hatched it and let the fish go because we had a security breach, they can't breed. We don't see any thing but positive in terms of our impact on the environment.

[music interlude]

Thierry Harris: We'll have more on the opponents to Aquabounty's GMO Salmon at the end of the show. Being the first company to bring this innovation to market isn't a small feat. Especially with such vocal opposition to the product. I asked Wulf about the entrepreneurial spirit at the company.

[music interlude]

Sylvia Wulf: One of the things that I'm so proud of and privileged to be part of a team that has what I call an amazing can-do problem-solving type of attitude. They really believe in what they're doing, they want to transform aquaculture with using technology. They want to be able to bring a healthy protein to market to feed people. We all talk about the fact that there's going to be 9 to 10 billion people in the world, we've got to use technology to be able to feed those people but we've got to do it in an environmentally sustainable way.

And the way to do that is technology, which means you really got to be thinking about the creative ways to solve those problems using science.

[music interlude]

Thierry Harris: As we know, studying lots of technologies and transfers of technologies from university research labs into commercial markets oftentimes it can be a bumpy road because either the market isn't ready, or the technology hasn't been tweaked enough in order to satisfy the market demands.

It is the hardest thing in the world to be at the tip of the spear of the cutting edge technology. And I guess another thing that must be a challenge is to have the right types of people who understand how this technology works and to be able to hire those people to be able to work on these farms and to make sure that they're maintained in a safe and secure manner and optimizing that.

Is that something as you see AquaBounty growing that you're taking into consideration how you're going to get people to be able to employ, to be able to produce this fish?

Sylvia Wulf: We think partnerships with colleges, universities, trade schools is going to be critically important because if you think about it, there's two critical aspects to what we do. The first is the biology of the fish, we really need to understand what the fish needs to be safe and productive, healthy, and productive. The second is we need technical competence in terms of managing the biofiltration in the water.

Working with universities, and colleges, and technical schools will be critical to be able to combine water management with the biology of the fish. Because we're clearly not using traditional methodologies when you look at our land-based farming. We think that that's going to be a critical aspect of being successful. There's a lot of universities that are very interested in building programs around what we do.

You know we want people like those team members we have currently that are excited about the future that wants to use technology to solve global problems and be part of that moving forward.

[music interlude]

Thierry Harris: Aquabounty currently operates two farms, one in Canada in P.E.I, and another in Indiana. It plans to open a new facility which they call Farm 3 with a capacity of [10,000 metric tons in Ohio, which will open in 2023](#).

I asked Wulf what other markets she saw Aquabounty competing in.

Sylvie Wulf: We think that anywhere there is a country that is a "net importer of salmon", therefore, they're not producing for themselves. There's an opportunity for this kind of farming, and that our fish are a real competitive advantage because of their growth cycle and their feed conversion. We really look at areas of the world like, I'll use Israel as an example. Food security is incredibly important. They import all the salmon that they consume.

We've actually gone through field trials and approval in Brazil. Brazil's also a net importer. Then you look at countries in Asia, China being the best example where they definitely are a net importer and this is again a food security issue for them. We've really concentrated in Brazil, Argentina, the Middle East, and China.

Thierry Harris: We know that you are a public company, so there has been quite a few investments. You, as a CEO, it's literally like moving the pieces of the chessboard around here. It must be tremendously interesting and engaging time for you. How does that ramp up? What kinds of investments are you looking for moving forward?

Sylvia Wulf: Our plan for financing the project of Farm 3 is really to raise the capital via the equity markets primarily. Then once the fish are in the water, it'll be easier for a lender to see the working capital, that we actually have a product that's ready. These farms take anywhere from 18 to 24 months to build. Then, another 18 months to raise the fish. This is definitely a long-term investment proposition so the right investor really is critical.

[music interlude]

Thierry Harris: One of the key competitive elements that Aquabounty is counting on to attract more investment is that their fish take less time to mature than non genetically modified Salmon. Wulf elaborates:

[music interlude]

Sylvia Wulf: A conventional salmon in a net pen environment or wild-caught environment is anywhere from 24 to 36 months to 30 months, depending on the conditions. Meaning, if the water gets colder, the fish don't eat so they don't grow as quickly. We've seen even with wild-caught populations, that's why you see dramatic differences from year to year in terms of how many fish are actually caught. Typically that's because of climatic conditions. That timeframe compared to our 18 months, that's really the opportunity here, is our salmon grow to maturity once those eggs hatch in 18 months.

That, again, we're able to produce more salmon in this type of farm than a conventional farm using the same technology would be able to produce.

[music interlude]

Thierry Harris: With regards to the technology that hatched the first genetically modified salmon 30 years ago to the technology that you have in your farms that's going to output that salmon, are there any other fish that are being farmed that way? Does AquaBounty potentially have the idea to create a platform technology where others can either franchise that or scale that into different streams, pardon, the pun of a fish that would come out of there?

Sylvia Wulf: Well, right now, tilapia is being farmed using recirculating aquaculture systems, and they grow to maturity pretty rapidly. We're not pursuing that at this time. There is also, I believe, a yellowtail that is being produced using RAS technology right now.

The way we look at it is we'll continue to use biotechnology to improve the product. Then looking at other species that may be problematic either from an environmental perspective or a supply perspective. Because if you don't have to worry about quotas, overfishing, and you can create that fish that grows well in this type of environment, those are opportunities for us or where there are environmental challenges or with the production of shrimp right now. A lot of shrimp is treated with the antibiotics, and there's a lot of shrimp eaten. Being able to farm

shrimp in this type of environment is very attractive, but the shrimp doesn't necessarily adapt to it very well. We're definitely looking at that as a species as well.

[Begin End music]

Thierry Harris: You're sticking to the salmon for now, and you've innovated there.

We are a podcast and we have a website that's really dedicated towards increasing awareness of commercialization of technologies and people who will be listening to this primarily are in the academic sector.

What kind of questions would you like students working on in terms of the case study here for AquaBounty?

Sylvia Wulf: I think the question for us is always, what problem are we solving and really understanding what is the problem that you're trying to solve? Are you innovating with a purpose that's going to in effect solve that challenge? AquaBounty saw an opportunity to create a healthy protein that could grow in a land-based environment. You're going to feed more people, and you're going to do it in an environmentally sustainable way.

I would just challenge students to really be thinking about any innovation that they're looking at. What is that innovation going to solve for either in terms of feeding more people, affecting the environment in a positive way, are they affecting the fish in a positive way? Are they solving a problem that everyone agrees needs to be solved?

Thierry Harris: It's important to note that while Aquabounty technology was approved by the [FDA in 2015, in November 2020 a Federal Judge in San Francisco ordered the FDA](#) to return to its decision and more thoroughly analyze the environmental consequences of a potential escape of genetically engineered salmon into the wild. The decision does not impact Aquabounty's current farm operations. Aquabounty is continuing its harvesting operations for [distribution in markets in North America](#).

The company has successfully sold out its first commercial harvest of five metric tons in the spring of 2021. It hopes to produce 100 metric tons a month at its Indiana farming facility. Food services giants [Aramark stipulated that it would not be purchasing any genetically modified Salmon](#) without mentioning Aquabounty specifically. Aquabounty raised close to [\\$130 million in a public stock offering in February 2021](#). Samples were sent out to potential retailers. Wulf noted that the color and texture was good.

The flavour was clean, but didn't taste like wild Salmon. [She hopes the milder clean taste will attract more consumers to the Salmon category](#).

That's it for this two part Aquaculture series. For more information check out the episode show links on our show page. There's loads to

discuss here, write to us at solutions @ ie hyphen knowledgehub.ca to keep the conversation going.

[End music]

[Begin Promo Music]

Narration: And now a final word from our sponsor, the IE-KnowledgeHub. IE-Knowledge Hub is a website dedicated to promoting learning and exchanges on international entrepreneurship.

If you are an education professional looking for course content, an academic researcher seeking research material , or someone interested in business innovation check out IE-Knowledge Hub.

Let's pickup where we left off for Bonlook, an online prescription eyewear company.

Louis-Félix Boulanger: We feel very confident. But just looking at pictures of it online sometimes does not do it justice. We are definitely seeing that a physical presence has a great impact on online sales and vice versa.

Narration: That's Louis-Felix Boulanger, Sophie's brother and Chief Operating Officer at Bonlook. Louis is talking about the need for Bonlook to expand their online presence with physical brick and mortar stores. Bonlook places a very strong emphasis on the customer buying experience. They want every detail of the experience to be a positive one. Sophie elaborates.

Sophie Boulanger: It's an industry that hasn't experienced any change in the way the retail is structured, I would say for the past 30 to 40 years. And traditionally shopping for eyeglasses it's not a good experience, we've surveyed a lot of people. So you come in the physical, like the brick and mortar optician store and most of the glasses are locked up. So you have to ask a sales lady that goes next to you and she unlocks everything, you are trying on maybe a few pairs so it's not, it's not accessible. Our brand is meant to be accessible so the way we think about our website, our whole exchange and return procedures. The way our kiosk has been built is everything is geared towards offering an accessible brand experience. You want to go in the kiosk, try 50 pairs for an hour and then just go. There is no problem.

Narration: Bonlook has since expanded from a single kiosk to multiple small and fashionable stores across Canada.

Louis-Félix Boulanger: Traditional stores are based on, customers come in, they pay a couple of hundred dollars for their frames and each store sells a very low volume, a low amount of pairs of glasses. And it's, it's rapidly evolving because of technological advancements in

manufacturing and precisions in measurements in optics. It's evolving into an industry that will be characterized by higher volumes, much higher volumes and lower margins. Bonlook is trying to position itself like companies like Banana Republic and the Gap. And so we are trying to cut a lot of the middle man, design and manufacture ourselves as well as retail it ourselves.

Narration: You've been listening to segments of the [Bonlook video case study](#). To learn more about Bonlook's journey, watch their full case available for free at [IE hyphen knowledge hub dot ca](#).

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Thierry Harris: Market Hunt is produced by [Cartouche Media](#) in collaboration with [Seratone Studios](#) in Montreal and [Pop Up Podcasting](#) in Ottawa. Market Hunt is part of the IE Knowledge Hub network. Funding for this program comes from the [Social Sciences and Humanities Resource Council of Canada](#). Executive producers [Hamid Etemad](#), McGill University, Desautels Faculty of Management and [Hamed Motaghi](#), Université du Québec en Outaouais. Associate producer Jose Orlando Montes, Université du Québec à Montréal. Technical producers Simon Petraki, Seratone Studio and Lisa Querido, Pop up Podcasting. Show consultant JP Davidson. Artwork by Melissa Gendron. Voiceover: [Katie Harrington](#). You can check out the IE-Knowledge Hub case studies at [le hyphen knowledge Hub dot ca](#). For Market Hunt, I'm [Thierry Harris](#), thanks for listening.

[End Credits Music]

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