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Chair

Mr. Rodney Weston

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● (1540)

[*English*]

The Chair (Mr. Rodney Weston (Saint John, CPC)): I call this meeting to order.

Thank you very much, ladies and gentlemen, for joining us today. On behalf of the Standing Committee on Fisheries and Oceans, we appreciate your taking the time to meet with us to try to answer some of the questions we might have arising from comments you might make and to respond to concerns that members have regarding the aquaculture industry.

Mr. Werring, I believe you're going to lead off for your group via video conference. Is that correct?

Mr. John Werring (Aquatic Habitat Specialist, Marine and Freshwater Conservation Program, David Suzuki Foundation): No, Chair. David Lane is actually going to lead us off.

The Chair: Thank you.

Mr. Lane, we generally allow about 10 minutes for presentations. At that time I would ask you to introduce your associates, who are there with you today and joining you in the video conference, and Dr. Tyedmers, who is joining us here in our committee room as well. You'll hear a beeping noise to indicate that your time has expired. The members are constrained by the 10-minute timeframe for questions and answers, so you'll hear a beeping noise throughout the committee proceedings today. Don't be alarmed by it, but I ask that after you hear the noise, you bring your comments to a conclusion. I'd appreciate that.

Mr. Lane, please begin with your opening comments.

Mr. John Weston (West Vancouver—Sunshine Coast—Sea to Sky Country, CPC): I have a point of order.

Chair, may I interrupt for a second?

The Chair: Go ahead, Mr. Weston.

Mr. John Weston: I'm seeing a little pane on the screen. It's not clear to me that the people who are there in the room know who's here, so maybe you could give them a sense of who is on the committee, unless they already know that. It might take 10 seconds.

The Chair: Thank you, Mr. Weston, for your point.

I'm assuming that the people making the presentations today are aware of the members of the committee, and when you ask questions, you'll be recognized at that time. We're counting on the video to show your face to the members who are joining us here today, but for the interest of the people joining us by video conference, we have Mr. Allen, Mr. Calkins, Mr. Kamp, Ms. O'Neill-Gordon, Mr. Weston, Mr. MacAulay, Mr. Byrne, Mr. Andrews, Monsieur Blais, Monsieur Plamondon, and Mr. Donnelly. They are all members of the committee, as am I. I am Mr. Weston as well.

Mr. Lane, if you would proceed with your presentation, I would appreciate it. Thank you.

Mr. David Lane (Executive Director, T. Buck Suzuki Environmental Foundation, David Suzuki Foundation): My name is David Lane. I'm with the T. Buck Suzuki Environmental Foundation. To one side of me is John Werring, who is with the David Suzuki Foundation, and Ruby Berry, from the Georgia Strait Alliance. On the other side is Michelle Molnar, also from the David Suzuki Foundation.

May I get clarification about the 10 minutes? Is that 10 minutes for us as a four-person panel, or 10 minutes for each individual?

The Chair: It would be 10 minutes for your panel, Mr. Lane.

Mr. David Lane: Okay, very good. We'll be brief, then.

We are here representing a coalition of groups in British Columbia called the Coastal Alliance for Aquaculture Reform, which is made up of the groups that are here at the table, and also Watershed Watch and the Living Oceans Society. We've been together as a group for 10 years now, working on issues related to environmental impacts from salmon aquaculture and looking at solutions, which we believe very much point in the direction of closed-containment technologies that can eliminate most or all of the environmental impacts that have been flagged by the scientific community.

My organization is the T. Buck Suzuki Environmental Foundation. For clarity, this organization is separate from the David Suzuki Foundation, with a different history and a focus solely on fisheries, whereas the David Suzuki Foundation has a very broad mandate.

I want to introduce the issue of closed containment, which we believe is a very viable solution to the problems described in the scientific literature regarding open-net salmon farming in British Columbia. We believe it manages to accomplish the key solutions.

Sea lice is one of the most noted subjects, as far as impacts from salmon aquaculture are concerned. With closed containment, there would be no sea lice problems whatsoever, and no disease problems feeding back into the ocean environment. We're assuming that most closed-containment systems would be on land; therefore, those problems would be eliminated entirely.

The problem of escaped farmed fish would be eliminated entirely, as would the problem of marine mammal kills—that's sea lions and seals, which happen in large numbers on the B.C. coast because of predator attacks—and the problem of antibiotics and pesticides going into the ocean environment. All of these problems can be solved by land-based closed containment. That is why our coalition sees it as an alternative that should be mandated and should be supported by governments, and we should be moving towards a transition on those technologies.

We believe there are a number of myths that exist as far as closed containment is concerned, and those myths are very easily addressed. Often it's said that closed-containment technologies are not economically or technically viable, and our speakers will be addressing those issues.

It has been noted by some that there is more energy consumption and therefore more greenhouse gas. There's also waste produced that has to be dealt with. In fact, we believe that all of those issues can be solved very easily by using the waste as a resource. Fish waste can be used as a fertilizer for aquaponics that grow other products, notably agricultural products in greenhouses. It has been tried with a lot of different kinds of aquaculture.

Also, fish waste can be used as an energy source. Through anaerobic digestion it can create enough energy to run an entire closed-containment system and probably produce some excess energy as well.

With that as an introduction, I'm going to give the floor to John Werring. John is from the David Suzuki Foundation.

● (1545)

Mr. John Werring: Thanks, David.

Mr. Chair, my name is John Werring. I'm with the David Suzuki Foundation. I'm an aquatic habitat specialist. I have a Master of Science degree from the University of British Columbia and I'm a registered professional biologist in the province of British Columbia.

I want to bring out the point that one our goals at the David Suzuki Foundation, and with CAAR in general, is to try to get the Canadian aquaculture industry to transition to a more sustainable and less environmentally destructive method of raising seafood. Closed-system aquaculture is certainly one of those options, and it is probably the best option to pursue.

One of the issues I'd like to raise today is that we've been made aware that the Canadian government is proposing to expand the aquaculture industry in Canada within the next decade, and the way they propose to do that is solely through the use of current open-net pen technology. We are trying to get the government to consider using closed systems to obtain that level of expansion, but anybody who brings this up when they attend a meeting to discuss this new strategy is being told that it is not an option. The new strategy is called the national aquaculture strategic action plan initiative, and it is being promoted by the Department of Fisheries and Oceans. Anybody who questions the use of open-net pen technology and asks that they consider closed systems is being told that it is not an option. We think this is something that the committee needs to be made aware of.

Thank you very much.

Ms. Michelle Molnar (Marine Researcher and Policy Analysis, David Suzuki Foundation): My name is Michelle Molnar. I'm with the David Suzuki Foundation. I have a Bachelor of Economics from the University of Western Ontario and a Master of Public Policy from Simon Fraser University.

While it is generally held that close containment technology offers several environmental benefits, debate remains over whether this technology is economically viable. As of yet, there has been no economic analysis completed on closed-containment aquaculture that considers all of its impacts from a societal viewpoint.

However, there have been two recent attempts at a financial analysis. These studies consider a subset of the costs and benefits that apply to the owner-operator or the investor. Both studies find that land-based aquaculture can produce a positive net income, and we recommend that the next step should be to expand upon the analysis to consider all stakeholders who have standing, including government, first nations, the environment, local communities, and the public at large.

One of the two existing studies or financial analyses I referred to was completed by Dr. Andrew Wright with Save Our Salmon. He found that the capital costs were approximately $12 million. The annual operating costs are less than $6 million. The net income range is anywhere from $5 million to $13 million, depending upon your harvest strategies. The higher end of the range is associated with a potential of using waste as a feedstock for a secondary product, which David referred to earlier.

The second study has recently been completed by the Department of Fisheries and Oceans. They found that capital costs were approximately $22 million, that annual operating costs were about $7 million, that there was a positive net income of approximately $600,000 and that the net present value, using year three as a benchmark, is approximately negative $2 million.

However, we found that the capital costs were high. Estimates of the cost of land and the amount of land and equipment were excessive. There were some concerns regarding assumptions around feed cost labour estimates, the contingency rate, and the depreciation rates used, and there was no consideration of environmental impacts.

CARR and Marine Harvest have jointly agreed to conduct an economic analysis. This analysis will be completed in four phases. The first phase is to develop performance criteria. The second stage is to complete a financial analysis similar to what's been done by DFO and Andrew Wright. The third stage will identify external impacts and will attempt to monetize them where possible. The final stage will look at developing an economic model that considers economies of scale; production efficiencies; a range of environmental, socio-economic, and performance matrices; and the cost savings related to locating this technology near more developed centres.

● (1550)

Ms. Ruby Berry (Program Coordinator, Salmon Aquaculture, Georgia Strait Alliance, David Suzuki Foundation): Hello, everyone. My name is Ruby Berry. I'm with the Georgia Strait Alliance, and I'd like to talk about the community economic development potential.

I understand you have come across the report that we co-authored outlining the global assessment of closed-system aquaculture, and I wanted to just point out that while it's a good overview and most of the systems in that report are still in operation, the report was out of date almost as soon as we published it. According to the operators, this technology is developing by leaps and bounds and is hard to keep track of in any kind of published manner.

As a result of that, what we're seeing is that the technology for closed containment has improved to the point that there is no doubt in any of the engineers' or operators' minds that this is a technologically viable system for growing fish, and indeed has the potential for actually being much more efficient in that the growth ratios and the conditions the fish are grown in actually can be optimized and the fish can probably be grown quite a bit faster.

As a result, a number of communities and enterprises are looking at developing closed containment. We know of five to seven projects that are in development at the moment, and some of them are actually ready to hit the ground. The only barrier at this point is investment. It's an economic barrier. In the spreadsheets, research on the economics of it shows a likely turnaround of investment in five to seven years. It's just that the initial investment is a challenge.

There are a number of first nations, small operators, and engineers who are currently working on hatchery systems to grow it—it's an expansion, essentially, of hatchery technology—who are recognizing the value in this of local jobs. Closed containment can be sited in less remote areas, so they can actually be close to the labour force. We're seeing expectations of increased food security. We're seeing development of projects from small local-sized projects the size of one current open-net farm—projects that can feed the local economy, provide jobs, and also provide some local food—all the way to very large industry-sized operations that are looking at exporting and competing with the current open-net systems.

There are two closed-containment systems in operation right now. One is an operation in the Lower Mainland that essentially feeds a niche market in the restaurant community in Vancouver, and the other one is in Washington State. It has just developed a relationship with Overwaitea Food Group, which is now selling closed-containment salmon in their stores at the moment and has said to us that they're not looking at a price premium. They're selling it at the same rate as the fish grown in open nets and they're still turning a profit. They've said to us very clearly, “If you build it, we will buy it”. They're very clearly interested in an ecologically sustainable way to grow salmon in farms, and they're supporting the move to closed containment.

As I said, a number of these groups are ready to hit the ground running, and the only real barrier that we're seeing is that there's a need for some infusion of income.

We're looking to you for some recommendations for some government funding. There are a number of mechanisms already in place through the AIMAP program and other funding programs. This would work very easily with them if funding could be directed toward the development of closed containment. Funding needs to be larger than the current particular allocations in order to get these operations under way, but as I said, it's not very long before they become self-sustaining economically as well as environmentally.

● (1555)

The Chair: Thank you very much.

Dr. Tyedmers, do you have some opening comments?

Dr. Peter Tyedmers (Associate Professor, School for Resource and Environmental Studies, Faculty of Management, Dalhousie University): Thank you for your interest and for the invitation to appear here. This is the first time I've ever had this sort of opportunity.

My name is Peter Tyedmers. I'm an ecological economist. My training includes undergraduate degrees in geological sciences and the law prior to undertaking my PhD studies at UBC in a department called resource management and environmental studies. Indeed, I know a couple of former colleagues from the west coast who have joined us by video conference.

For the last nine years I've been employed in the School for Resource and Environmental Studies at Dalhousie University. I was first appointed in 2001 as an assistant professor. In 2007 I became a tenured associate professor.

Within the domain of ecological economics, my research interests encompass an understanding of what I and others refer to as the life cycle energy and environmental impacts of food systems. We use something called life cycle assessment to try to understand the aggregate flows of material and energy inputs into how we produce things. My interests are in using LCA to understand the impacts of food systems, in particular fisheries- and aquaculture-related seafood systems, and the role technologies can play in moving us away from, or towards, more sustainable futures.

With colleagues and students, I've worked on a variety of research projects within fisheries and aquaculture, looking at U.S.-Canadian lobster fisheries, Antarctic krill fisheries, and global energy inputs to capture fisheries. I suspect, given the context of your current interest, that potentially you're most interested in the work we did in terms of our salmon life cycle assessment project. This was work that my students and I undertook with colleagues from the Swedish Institute for Food and Biotechnology in Gothenburg, Sweden, and from Ecotrust, based in Portland, Oregon.

It set out to try to characterize and understand the scale of material and energy flows and the resulting environmental impacts, at a global scale—meaning contributions to greenhouse gas emissions, utrifying emissions, etc.—associated with the major salmon farming regions of the world, those being Norway, Chile, Scotland, Alaska, and British Columbia. We do rank fourth in the world in production.

In the context of this project we also wanted to look at alternative ways in which salmon could be produced. One of my students undertook some work looking at what differences might flow from producing salmon organically, and another student undertook work looking at the potential implications of using alternative culture technologies, so we were looking at different environments in which we could grow salmonids. I'm assuming that this is the work that you're most interested in right now.

This work was led by my former student, Dr. Nathan Ayer. All of the work, including this, used what I refer to as life cycle assessment. The major question that we set out to answer was to better understand a potential shift from conventional net-pen culture to other forms of production. We and the people who joined us by video conference think we have a good understanding of the benefits these systems will provide in terms of reducing local ecological impacts, but to date, or before we did this work, we didn't really understand the scale of material and energy requirements to drive these systems and how these translate into broad-scale environmental concerns.

We undertook work to compare a very typical net-pen production in British Columbia as of the mid-2000s with a marine-based bag system that had been trialed in British Columbia, along with data from what we call a flow-through tank farm using salt water pumped out of the ocean into three tanks in which the salmon were cultured commercially for, I think, a total of three years, or two full grow-out cycles. We also used data from a very new farm. It's about four or five years old. It's a freshwater-based, recirculating culture technology system based in Nova Scotia, just outside Truro.

● (1600)

One thing I would mention is that while the other three systems we modelled were all culturing Atlantic salmon, the farm in Nova Scotia was culturing Arctic char. For our current purposes, I think the difference in species is less critical, but if people have an interest in it, I'd be pleased to discuss it.

We chose these systems because actual real data were available. We didn't set out to model artificial or theoretical systems, although those could be very interesting and insightful analyses to do. These were actual opportunities to exploit real data from real-world pilot studies or commercial operations to understand what it takes to grow salmon in different culture systems.

It was also a nice study from my perspective, because it allowed us to look at a spectrum of ways for culturing fish. If we think of a net pen as a fairly open system and a fully enclosed freshwater-based recirculating system as a system in which, if fish get out, all they do is flop around on the floor until they die, the study spans the whole range of potential technologies that are under consideration.

Before I briefly turn to some of our results, let me highlight two things.

Our work did not look at the local ecological benefits of these systems or the costs, nor did we have a chance to look at socio-economic dimensions.

The other important issue is that we did not attempt to quantify what might be possible with these technologies if they operated more efficiently, either because of economies of scale or because better technologies were applied through the use of better pumps or new ways of doing things with different feeds. We took the systems as they existed and as they were running. We found marked differences in the performance of the systems modelled.

I'll very briefly give a little background. When you do this type of work and look at a net-pen system, for example, you're concerned about the total amount of greenhouses gases that are emitted to produce a tonne of salmon. Typically 90% of greenhouse gases result from the provision of feed. As for what happens at the farm site or what happens when moving boats around, it doesn't really contribute very much at all. That's what we saw in the case of a net-pen culture system.

However, as you move towards a more intensive and more contained culture, you have to substitute eco-technologies, using pumps to move water around and adding oxygen, either in the form of bottled oxygen or oxygen generators. You need to use technologies to clean the water if you're going to have a recirculating system; otherwise, the environment isn't conducive to growing fish.

All of these technologies require power. You're substituting for the ecosystem services that are enjoyed by a net pen. Water flows through it, it's oxygenated, and it removes wastes. These things come at a price to local environments, but you're substituting them with technologies that are underpinned by electricity.

Let me give you some examples. The differences in the systems we modelled were fairly small between the net pen and the marine-based bag systems that were trialed in British Columbia, largely because the electricity required only had to move water a very short distance. It only had to lift water from outside the pen into the pen. Those systems turned out to be similar in terms of total energy input, total greenhouse gases, etc., but when you moved to land, using the existing technologies that were in Cedar, B.C., the energy input went up markedly.

To put this into context, I actually have notes here on the greenhouse gas emissions. Compared to the in-water net-pen system, the flow-through system had five times the total energy requirements and greenhouse gas emissions. When we looked at the recirculating system, I think the total energy and greenhouse gas emissions were approximately 10 times higher.

● (1605)

In part, however, the higher greenhouse gas emissions associated with the Nova Scotia culture system occurred because Nova Scotia electricity is about 80% coal-fired, whereas in British Columbia about 90% of electricity is provided through hydroelectricity, so the major source of these differences, when you look across the systems, is the much greater amount of energy required to pump water and to provide oxygen and filtration and other inputs to maintain high water quality. In the case of a land-based system, it is the fossil energy inputs needed in Nova Scotia to maintain the thermal regime of the culture environment. It gets cold in Nova Scotia, and in winter you have to heat the warehouses to keep the fish alive, or at least feeding at a rate that makes them economically successful.

Simply put, while isolating salmon from the aquatic environment may provide benefits in terms of reducing local ecological interactions, it also means that many of the ecosystem services, in terms of oxygen provision, waste elimination, and maintenance of a reasonable thermal regime, are diminished or lost and have to be substituted for through technologies.

This isn't to say that we shouldn't pursue larger-scale trials with land-based or closed-containment technologies. We just have to understand that in the pursuit of local-scale environmental and ecological improvements, we may be trading off contributions to global-scale concerns.

The Chair: Dr. Tyedmers, I'll have to interrupt you. I'm sorry, but e're running out of time, and the members have....

Dr. Peter Tyedmers: I'm sorry, of course. I just didn't hear the beeping.

The Chair: Actually, the clerk forgot to set the beeper.

Dr. Peter Tyedmers: I apologize. I didn't realize that I had rambled.

The Chair: It's okay.

Mr. Byrne, you had some questions.

Hon. Gerry Byrne (Humber—St. Barbe—Baie Verte, Lib.): Thank you, Mr. Chair. I'll lead off with a question to Dr. Tyedmers.

As a natural resource or ecological economist, you said that one of your specialties or focuses is the flow of energy within food systems. Would you agree that in salmon production, based on the analysis of feed conversion ratios, you actually gain a significant advantage over other food production systems, such as the beef or poultry industries? Would you dispute—my numbers could be a little bit off here—that you need about five or six or maybe even eight kilograms of feed to produce one kilogram of beef? In the salmon industry, it's almost a 1:1 ratio. In fact, it takes about 1.25 to 1.5 kilograms of feed to produce one kilogram of salmon. Is that true?

Dr. Peter Tyedmers: Coarsely speaking, if you're just looking at the feed required to grow a certain biomass of fish, in salmon aquaculture net-pen systems it's around 1.3 kilograms. Sometimes they do better. Sometimes, when things go badly, it's higher.

My recollection on beef productions is like yours. It's much higher. There are different reasons for that, but I would caution you against using a feed-to-growth ratio as a hard measure of overall ecological performance, because the diets are very different in these animals. For example, the moisture content—colleagues who may be speaking to you later might have a better sense of this—in a concentrated pellet feed might only be in the single digits, whereas the roughage and silage you feed to cattle have a much higher moisture content. You're trading off a lot of water in one case for a concentrated, high-nutrition, high-density feed. It is a poor measure of efficiency. These animals are also completely different, in that warm-blooded animals have to maintain their temperatures above background; fish don't.

Let me get to your core question on whether farmed salmon systems are higher-performing systems in terms of efficiency. You always have to think about what you are measuring when you talk about efficiency. If it's in terms of industrial energy inputs, then yes, they are a higher-performing system than terrestrial livestock, cattle in particular, but they are not so much better than chicken. Chicken is actually a very high-performance system that is very comparable to farmed salmon. If you are talking about greenhouse gas emissions, farmed salmon production is again much higher-performing than beef. Roughly speaking, let's put it in this way: if you produce a tonne of farmed salmon, you release, from a life-cycle perspective, about two tonnes of carbon dioxide equivalent. It's about 10 to 14 tonnes of carbon dioxide equivalent for beef.

● (1610)

Hon. Gerry Byrne: I don't mean to interrupt, but time tight, as you can imagine.

You introduced a pretty important concept: how we look at variables that impact this industry. Of course, I'm not here to lead, but I note that the amount of animal protein in fish feeds is relatively small compared to that in the feedstocks of other farm animals. I think that's a fair comment.

Dr. Peter Tyedmers: I think it's inverted. The amount of animal-derived protein in a farmed salmon diet, although it doesn't have to be this high, tends to be much higher than the amount of animal-derived protein that ends up going into a typical swine or dairy system.

Hon. Gerry Byrne: On this issue of where we can actually look at this, the rubber has to hit the road somewhere. Where can this committee go and study a closed-loop aquaculture system in Canada, either land-based or marine-based? Where can we go to look at one? The case has been made here by others that the economics are very sound. Where can we go to see one of these in Canada, or if not in Canada, in the world?

Dr. Peter Tyedmers: In Canada, I can think of the Arctic char farm just outside of Truro. It's on the Millbrook reserve. As far as I know, it's in operation It was opened probably four or five years ago.

Hon. Gerry Byrne: Should we be cautious about inferring similarities between char and salmon?

Dr. Peter Tyedmers: I'm not a fisheries biologist, but my understanding is—

Hon. Gerry Byrne: We're studying salmon aquaculture.

Dr. Peter Tyedmers: I understand that. Our friends from the west coast are aware of some in southern B.C. I think there's a flow-through system there. I don't think it's a recirculating system.

As for char and salmon, the one reason people are growing char in recirculating systems is that you get a higher price, that's an example of a fish that you will get paid more for at the back end. The other thing about them, as I understand it, is that they tolerate much higher stocking densities. These animals will naturally tolerate being at 60 to 70 kilograms of biomass per cubic metre. You can imagine a cubic metre, and you can imagine 70 kilograms of biomass in there. Atlantic salmon aren't so happy doing that.

Hon. Gerry Byrne: I have one final question. Then I'll pass it over to my colleague.

Could one reason it is in southern B.C. be access to hydroelectricity and the power grid? In northern B.C., the grid is not quite as accessible for supplying good clean hydroelectricity, is it?

Dr. Peter Tyedmers: You're absolutely right. One of the really interesting outputs of our work was that we realized how important location is. Location matters, if you're concerned about large-scale potential contributions. Location matters in terms of local ecological effects, but it also matters in terms of greenhouse gas emissions.

● (1615)

Hon. Gerry Byrne: My friend has a question before we go.

Mr. Scott Andrews (Avalon, Lib.): I have a couple of questions, Peter.

Just to confirm what you said earlier and just so I understand, the carbon footprint from an enclosed system on land is bigger than the carbon footprint for the current aquaculture industry. I think that is what you said. I just wanted you to—

Dr. Peter Tyedmers: Sure. I derailed myself a little bit as I was going through my opening remarks.

Based on the data from the systems that were in operation or are currently in operation and that we were able to model, that is indeed the case, but it's underpinned by the level of technology that you bring to bear. The more technologies you use, the more power is required. It's also affected by where that power comes from, so if you build a system in Nova Scotia, you have higher greenhouse gas emissions for the same amount of electricity required than you would have if you built it in Quebec.

Mr. Scott Andrews: Okay. That gets me to a question my colleague just alluded to. Where in Canada are any of these flow-through systems? I know Ms. Berry mentioned there was one in British Colombia and I think one in Washington, if I'm correct. What size were those closed-pen systems you were referring to, Ms. Berry?

Ms. Ruby Berry: There are actually two closed-pen systems in British Columbia. The operator of one of them, a flow-through in-ocean system, has just joined us. There is also one on the Lower Mainland in Agassiz, B.C., called Swift Aquaculture. It's a relatively small operation. I don't have the specifics, but Rob Walker has just joined us and possibly could let you know where his operation is.

Mr. Robert Walker (Director of Canadian Operations, AgriMarine Industries Inc.): Hi, folks.

Mr. Scott Andrews: Go ahead, sir.

Mr. Robert Walker: I was about to say that I have a prepared statement for a little later, but we're operating in Middle Bay, near Campbell River, using a Future SEA technology, which is older technology. I believe you were talking about it earlier. Our intention is to launch our own solid-wall system later this year.

Mr. Scott Andrews: So there are no large-scale pen systems in Canada that we can compare with?

Mr. Robert Walker: That's correct.

Mr. Scott Andrews: Where did we get the economic analysis of it that was mentioned by Michelle, or the two economic analyses that had been done on that?

Ms. Michelle Molnar: Those were projections. They took the costs of closed-containment facilities from other locations worldwide. They modelled it quite a bit on closed-containment systems with other species, and with the help of engineers and biologists made what they assumed were the necessary changes for salmon. However, there is no large-scale or commercial-scale salmon aquaculture facility here in Canada.

The Chair: Thank you very much.

Go ahead, Monsieur Blais.

[*Translation*]

Mr. Raynald Blais (Gaspésie—Îles-de-la-Madeleine, BQ): Thank you, Mr. Chair.

Good afternoon, ladies and gentlemen.

My question is addressed to the videoconference participants. Recently, I saw a program on salmon aquaculture in Chile. I can tell you that when you see that, you have a lot of questions about what can be done well or poorly. In the case of Chile, you can see that things are being done very poorly because as in other areas unfortunately, the objective is quantity rather than quality. When that is the case, anything can happen.

You talked about enclosed tanks and open net pens in the ocean. I would like to know more about what was done in the Gaspé, the Quebec riding I represent, with land-based tanks. They were not in small, medium or large bays, but completely out of the water.

I would like you to tell us of the ways in which things can be done. I understand very well that whatever the type of salmon aquaculture one is practising, when you are doing this on a large scale, there are greater risks and a larger number of them. That is how I see things and I would like to hear what you have to say in this regard.

● (1620)

[*English*]

Mr. David Lane: This is David Lane responding.

I would point out that these are the kinds of systems in general that we're talking about. They are land-based tanks. There are two things I'd point out. First of all, by coming onto land in closed-containment tank systems, you are able to avoid what could be major disasters if you have a net pen in the ocean. You mentioned Chile, where they had a huge die-off from disease. Disease comes from the wild. That's only possible with open-net pens.

If you are the operator of an open-net pen, a lot of problems can be created, such as disease and escapes. About 100,000 farm fish escaped from net pens in British Columbia in 2008. That's millions of dollars lost for the operators.

These things can be avoided by coming on land, and we believe that at a commercial scale, the technological problems and the economic problems will be resolved. We believe there is an opportunity here for a new kind of industry, not only on the B.C. west coast but across Canada, through using salmon in closed containment. It has been done with other species.

Salmon has a good market. Canada has a good reputation. The environmental benefits are clear, and we think there can be a real move ahead in a new positive direction with a sustainable industry.

[*Translation*]

Mr. Raynald Blais: Would someone from Vancouver like to express an opinion on this?

[*English*]

Mr. John Werring: This is John Werring from the David Suzuki Foundation.

On that issue, we know that there are a range of different technologies. As Mr. Blais had indicated, there are tanks that have been put on land, out of the water. This causes a dynamic head; water has to be pumped from the sea into the tanks, so you do have pumping problems. To overcome that, some people who have put the tanks on land have put them in the ground, thus reducing the amount of head required to pump water up.

There are a whole range of different technologies that can be exploited; the problem is that there is no incentive being given for anybody to exploit or use those different technologies. There are too many excuses being made that it can't be done or that it's too costly or that there are things that can't happen, when in fact we know those technologies exist. We know they work for other species of fish, and there's no reason to believe that they can't work for Atlantic salmon. We simply need to try to get some kind of program in place in Canada that will enable people to experiment with those technologies and move forward at a much more rapid pace. As long as we just keep talking about it, it isn't going to happen.

Thank you.

[*Translation*]

Mr. Raynald Blais: My question is addressed to our witness here in Ottawa. Of course, as nothing is ever simple in this life, we understand that the land-based tanks are not a miracle solution either. With enclosed tanks you have higher operational costs and diseases are also a possibility, because the environment is much more closed. If there is a change in temperature that causes a lot of problems. Indeed, this just happened in the riding I represent.

I wonder if the better solution in the case of farmed salmon would not be small quantities in small tanks. The bigger the tanks, the bigger the problems. Is that an accurate perspective, would you say?

[*English*]

Dr. Peter Tyedmers: On the question of scale, it's hard to say. I take your point that if things go wrong and you're small, the consequences are not as dramatic, but there can be real advantages of scale, of being bigger. There are economies of scale once you know what you are doing.

To your more general question about where the answer lies, I don't have that answer. We're always having to weigh off different values. Ultimately, it has to be a financially viable project for whoever owns it. No one is going to grow salmon as a charity. Beyond that, if the choice is between trading off local effects from global, someone has to take that decision, and there is no simple equation to work that out. It is about the values that you all bring to the table.

● (1625)

The Chair: Thank you.

Go ahead, Mr. Donnelly.

Mr. Fin Donnelly (New Westminster—Coquitlam, NDP): Thank you, Mr. Chair, and I would like to thank all of our presenters here today for providing their input.

I'll start with a few questions to the panel. I think I will just read the three questions that I have, and then anyone on the panel could respond.

First, I often hear a common concern from the aquaculture industry, which is that they are strictly or highly regulated. I'm wondering if you could comment on this by comparing this industry and its regulations to other industries and their regulations—forestry or agriculture, for instance, or any other one you wish to compare it to.

Second, do you feel that the Department of Fisheries and Oceans is currently operating under the precautionary principle in terms of aquaculture?

Finally, it's my understanding that a number of environmental non-governmental organizations have been calling for the removal of salmon farms from the so-called Wild Salmon Narrows. Could any of you can comment on this issue? Could you tell us whether you support this measure, and why or why not?

Mr. David Lane: I think different members of the panel would probably answer the different questions that you've posed there. I'll just answer the first one on the regulations in British Columbia for open-net pen salmon farms.

How I would frame it is that there are a lot of regulations, but in the crucial areas where there are environmental impacts, they are either too weak or have no enforcement provisions whatsoever. The most widely publicized environmental impact to date has been the effect of sea lice generated in open-net salmon farms on wild juvenile salmon in the vicinity. On that issue, there is only a provincial policy. It's a policy that isn't effective at removing those lice from the farms. It's a policy that has no enforcement mechanism whatsoever, and no salmon farm has ever been charged or convicted in relation to anything having to do with sea lice. There is a huge environmental problem and no effective regulation whatsoever.

I'll leave it to others on the panel to tackle the other two questions you posed.

Mr. John Werring: I have just one point on the regulation issue. I agree with David that we're not seeing enforcement of regulations, but in terms of some of the regulations that are in place, currently one that we have one in British Columbia, the aquaculture waste control regulation, is probably the most comprehensive regulation we have around aquaculture. It looks at how companies have to manage their waste, monitor their impacts on the aquatic environment and the benthic environment, and try to determine whether their farms are required to be fallowed. It regulates the amount of tonnage of fish on sites. There are various things that are in place here.

The federal government is now in charge of developing new regulations pursuant to a Supreme Court order, and that is currently in place. They're looking at the existing regulations in the province of British Columbia and using an amended version of them. That amended version, in our view, is very much watered down compared to the regulation currently in place. It actually is a regulation geared towards the expansion protocol that I spoke of earlier, the national aquaculture strategic action plan initiative. That initiative is calling not for more farms, but for bigger farms on sites through increasing the number of net pens and increasing the total tonnage of fish. The environmental regulation around sites and the kind of monitoring required is being significantly reduced. We have some very serious concerns about that.

● (1630)

Mr. Robert Walker: If I could just interject something, from an industry player's perspective—

The Chair: Mr. Walker, I don't mean to interrupt, but we have you scheduled for the second hour. If there is somebody else on the panel who wants to respond first, it's their time.

Mr. Robert Walker: Thank you.

The Chair: Is there anyone else who wanted to respond?

Ms. Ruby Berry: Yes. This is Ruby Berry, from the Georgia Strait Alliance.

I'll just briefly address the question of whether we think DFO is using the precautionary principle in the process. I would have to say no.

We have a huge weight of evidence showing us that for juvenile fish passing the farms, there is significant danger from sea lice and for the potential of disease. There's a great deal of evidence showing potential for damage from the waste.

The response from DFO tends to be that it's not proven and that they haven't seen definitive science on it. We would disagree. There's an extreme weight of evidence showing us that there is significant potential for damage to the fish passing by and to the local fish stocks.

One of the things we all know is that effects on salmon are multitudinous. Many things affect the health of the wild salmon in their migration. There's pretty clear evidence that this is potentially one serious problem. If DFO were to take a precautionary approach, we would see this issue being taken far more seriously.

I'd also like to address the question of Wild Salmon Narrows. This is a name that's been coined to describe the narrowest passageway between Quadra Island and the neighbouring islands in the northern Georgia Strait. It is one of the passageways that juvenile salmon from the Fraser River use; my understanding is that about 80% of the fish pass through this general area. Both reports from local fishermen and traditional knowledge tell us that the juvenile Fraser salmon pass through there in great numbers, using the bays and protected areas along the passageway to stop and feed and rest before making their way farther north on their way out to the open ocean.

In that very narrow passageway through the archipelago, there are currently five active salmon farms. They contain close to five million farmed fish. What we've seen is a high incidence of sea lice. We expect that there's a potential for disease being transferred to these juvenile fish.

We would like to see this passageway cleared as an interim measure, with the intention of moving these farms into close containment. It would be an emergency measure so that at least there would one passageway for the Fraser River juvenile salmon to use in making their way out to sea.

The Chair: Thank you very much.

Go ahead, Mr. Weston.

Mr. John Weston: Peter, David, John, Michelle, and Ruby, you can tell by the nature of the questions that you have 12 MPs around this table who are earnest in their desire to learn as much as they can. You're each contributing a lot, and we thank you for what you've told us today.

I have got three questions.

First, there has been some discussion about upcoming regulations that the Government of Canada will enact as it takes over responsibility for aquaculture for the first time. Did you participate in those public consultations leading up to this enactment?

Second, I want to take up where Mr. Andrews and Mr. Byrne left off. We have in front of us pictures—I think provided by you, Rob—supporting your later testimony concerning closed containment in other places, such as Benxi, China. We also have Middle Bay. You mentioned Vancouver, which was a big surprise to me, because I've heard this hasn't been done successfully and that it's not technically feasible, so could you tell us again clearly where we should be looking?

My third question may be tough for you. Michelle, you mentioned different stakeholders, including government, first nations, the environment, local communities, and the public at large. You didn't mention private enterprise, but Peter, you made it clear that no one is going to do this for charity. What are the strongest arguments against closed containment, if you could think on the opposite side of the argument? Obviously, if we can tackle the toughest argument against you, you're going to win.

Those are my three questions.

● (1635)

Mr. John Werring: On your first question as to whether or not we participated in the regulatory reform process, yes, there has been a public process in place. The aquaculture management directorate and the people who are responsible for putting together this new regulation for the federal regulation of aquaculture in Canada have had public hearings here in British Columbia. We were invited to attend and make our views known, and we have done that. We have also made extensive submissions in writing to DFO.

That's where it ends, from our perspective. People have had the opportunity to comment. Fisheries and Oceans and the government will now take those comments under advisement in developing new regulation. That regulation will be presented to us pretty well as a *fait accompli*. I don't know if we'll have much opportunity to provide comments, except possibly when they become gazetted in the *Canada Gazette*.

Mr. David Lane: I'll answer the second question on the best place to launch a closed-containment project. Was that the gist of the question?

Mr. John Weston: It was on where the process can be viewed as it's actually happening. We've heard about Chile and China, but there's something going on close to home, in the Campbell River in the Lower Mainland. I wasn't really clear on your answer when my colleagues asked earlier where we can see this happening.

Ms. Ruby Berry: There is a small operation. It's really a matter of scale. You can see this happening in the Lower Mainland and in Middle Bay. I'm sorry to say that the best place to visit and see this in operation is in Washington State. I would love to tell you it's across the border in British Columbia, but there is an operation in Washington State. It's currently supplying closed-containment salmon to supermarkets in British Columbia, and they are looking at expanding. It's a matter of expansion to feed the market at this point, but they do have an operation. Aquaseed is the name of the company, and they're in northern Washington State.

Mr. David Lane: We believe that B.C. has a golden opportunity here because it has hydroelectricity at fairly cheap rates, as well as the infrastructure. With the downturn in the commercial fishery, there are unused fish processing plant opportunities and a skilled workforce. There would be many benefits if B.C. were to get involved in closed containment early in the game. The markets are there. Retailers are saying they would like this product. It's first off the mark who's going to win in this opportunity.

Ms. Michelle Molnar: On your final question about the arguments against closed containment, I would say they largely relate to the uncertainty. There are no commercial-scale operations of closed-containment salmon aquaculture, so that's a barrier. You seem to be looking for an example that we can model, but there isn't one of a large size.

Second, the initial capital cost is going to be a barrier. The two financial analyses came out with divergent costs, one being $12 million, another being $22 million. We believe that $12 million is the closer cost, but regardless, the cost is quite a bit higher than for net-pen aquaculture.

Finally, Professor Tyedmers alluded to the energy costs. As David mentioned, we think there are some natural advantages here in B.C. that could mitigate those costs somewhat, but there are other environmental non-market costs, and it will be difficult to estimate them and have them addressed in a business sense.

Basically there is uncertainty about existing operations, large capital costs, and energy.

● (1640)

Ms. Ruby Berry: With reference to your question about the groups that are interested, I would like to add that a number of private enterprises of various sizes are also interested. I'm sorry that I left them off the list. Some small entrepreneurs and businesses in British Columbia are building this kind of equipment and these kinds of systems for hatcheries. The technology is very similar to what is currently used in hatcheries, and they're looking at developing this technology and developing their business to do closed containment. Also, a couple of large businesses, other industries, are interested in transitioning to growing fish in closed containment, and there's also been some interest in the open-net industry in developing closed containment. There's a lot of interest everywhere, as far as we can tell.

Mr. David Lane: Further to that, a very interesting and new circumstance is that the very largest salmon farming company in the world, Marine Harvest, which has several billion dollars in assets, has decided that it's in its business interest to start a closed-containment pilot project, and it is doing so. They are putting their plans together and have decided that they need to be able to run these alternatives.

Mr. John Weston: Where is this plant, Ruby? Do you know where it is in northern Washington?

Ms. Ruby Berry: I believe it's near Olympia. I'm trying to remember the name of the place. I can get you that information.

Mr. John Weston: Could you? That would be great.

Ms. Ruby Berry: Yes, absolutely.

Mr. John Weston: I want to thank you again.

I represent West Vancouver—Sunshine Coast—Sea to Sky Country, so there are a lot of people in the riding I represent who very much care about this issue. I'm looking forward to hearing more from you as time goes on.

The Chair: Thank you very much.

On behalf of the committee, I'd like to say, once again, thank you very much for taking the time out of your busy schedules to come and meet with us today and answer our questions. We really appreciate your efforts.

We're going to take a short break while we prepare for our next witnesses.

Voices: Thank you.

● (1640)

(Pause)

● (1645)

The Chair: Gentlemen, on behalf of the committee, I'd like to begin by thanking you for taking the time to appear before our committee today and provide us with some answers to the various questions we have. I would ask your indulgence here, as well. We're running close on time, as you can probably appreciate.

What I would ask, Mr. Walker, Mr. Backman, and Mr. Erenst, is that you try to make your opening comments as brief as possible, and then we could get right to the questions. I know members have a lot of questions.

Mr. Walker, you may proceed with your opening comments. Could you try to restrict your opening comments to around five minutes? The same would apply to the other gentlemen here with us in our committee room as well.

Mr. Walker, please proceed.

Mr. Robert Walker: Thank you. I'll edit my prepared statement as I go.

Thank you again for allowing me to speak to the committee. My name is Rob Walker, and I am representing AgriMarine Industries, based in Campbell River, B.C. We have an office in Vancouver as well.

I am going to give you a quick history of AgriMarine, because I feel it's pertinent.

AgriMarine Industries started as a net cage farm in Kyuquot Sound on northwest Vancouver Island. We grew chinook salmon in nets, had lots of experience with algae blooms, and ended up losing our farms because we couldn't keep up with the mortality. That pushed us into looking at new ways of farming back then. We wanted to be farmers, but we were tired of losing money.

In 1999 or 2000, the B.C. government came up with its green technologies initiative, which provided us with an opportunity to have a look at the pre-existing land-based system at Cedar, just south of Nanaimo. It had failed a number of times prior to our getting in there, but they allowed us to crank it up again, test the systems, and examine the costs and husbandry as well.

We quickly learned that the energy consumption at the farm made it very difficult to be profitable. The farm required a flow-through of 10,000 U.S. gallons a minute, and that required a 200-horsepower pump to move that water. There was a substantial head there. For those who don't know, this farm is constructed of above-ground concrete tanks, a series of eight of them, and the pumping head was about 40 feet at times. We also discovered that levels of dissolved oxygen in the local water were really variable. We spent a lot of money on liquid oxygen. From a fish husbandry perspective, we were able to learn plenty.

Salmon actually thrive in closed environments provided the basics are there, such as the right level of oxygen, flowing water, waste removal, feed, etc. We were able to develop a lot of real-time monitoring systems, which helped us keep that environment stable.

It became apparent very quickly that cost-wise, the flow-through model was not efficient. We looked at what we could do and ended up with a marine concept. We used the flow-through model again, but we put it at sea level, which allowed us to essentially get rid of the cost of pumping. We just moved water side to side, as someone else mentioned earlier.

We looked at the structural innovation from a couple of perspectives. The first one, of course, is environmental. Our reasoning was that solid wall containers prevented escapes and marine mammal interactions. Avian interactions could be limited easily with bird nets. Waste capture was enabled by the collection of feces and feed in the bottom and limited interaction with finfish, and the containment of feces from the farm would reduce pathogen transfer and eutrophication and also eliminate any buildup of waste on the sea floor under the pens.

The second perspective was just general farm management. Fish require just the right amount of water and quality of feed and oxygen and so on, just like any other animal. You manage inputs and get the right outputs. Obviously you can't manage what you can't control, and when we looked at our net-cage experience, we realized we were subject to the whims of nature, such as algae blooms. We never had the jellyfish swarms that the southern Pacific has had; those are pretty horrible. Low-dissolved-oxygen events were another one we knew we could avoid. Solid wall systems obviously help us control all those external systems.

As another alternative, the land-based systems can be either freshwater or sea water. It's our belief that the sea water systems need to be parked next to the sea, but the B.C. coast isn't generally amenable to providing hectares of waterfront, particularly to a public that is antipathetic, I think, to the industry as it is, and there are certainly lots of NIMBY—not in my backyard—folks. The freshwater land-based systems could be located almost anywhere, and we felt that if the industry wanted to grow using that system, the industry would likely move to the larger markets such as New York and Los Angeles, and move away from B.C.

We're trying to keep an industry here in B.C.

● (1650)

We feel that the ocean is a very solid resource that we must work with respectfully, so the intentional design of a system that uses the sea without abusing it would provide us with technology that would allow our industry to flourish. We designed our system—a solid-wall closed containment system and marine-based, as I mentioned—with commercial scalability in mind. That's really key, comparing it to other systems that we've seen.

We looked at a number of materials, dimensions of tanks, pumping oxygenation, and the various technologies that help this system run, and while mooring remains site-specific generally, we determined that a vacuum-infused fibreglass structure, fabricated in sections for ease of transport, would provide us with the asset life we were after. We found high-efficiency pumps and oxygen-generation systems as well, so we've reduced our energy consumption in our modelling.

I'll make a quick mention of some of the financial support, because I'm obligated to. The Gordon and Betty Moore Foundation of San Francisco and the Sustainable Development Technology Canada group worked with us, and our associated company, the Middle Bay Sustainable Aquaculture Institute, helped us move from our concept to implementation.

You have some pictures in front of you, and I've already discussed Cedar. You can have a look at those. We've also launched our first tank in a reservoir in Benxi in China. That tank design is designed for the reservoir environment. It's not as rigorous a tank as we'll be installing in Middle Bay later this year, but you can see from the pictures that the concept is there. It's solid. It sits nicely within the walkway framework and so on.

We're rearing rainbow trout there currently, and we'll also rear chinook salmon. The second tank should be operational by the end of this week, and by the end of the year we'll likely have another six tanks in the water there. You folks were talking about regulatory environments earlier. It took us about three months from setting foot in China to the time we had full permission and a site available to us in China. It's about three years for the same process in British Columbia, so that's an important point to mention.

I believe one of your members mentioned the weather characteristics of our country, and that's one of the nice things. We have lots of cold water in the winter. Our tanks are designed to draw water from the depths, so we stabilize water temperatures. Particularly in freshwater systems, of course, we can draw from the thermocline and have a rearing environment that is available to fish all year round.

● (1655)

The Chair: Mr. Walker, perhaps I could interrupt to ask you to bring your comments to a conclusion.

Mr. Robert Walker: Okay, sure.

I imagine you'll ask lots of questions later, but I want to mention that a number of parties around the world are interested in our systems. We have a memorandum of understanding with the Lax Kw'alaams on the north coast. We're working with other parties in China and other parts of Asia, and in Europe as well. I feel strongly that we're on the right track.

I'll leave it there. You can ask questions for more specifics.

The Chair: Thank you.

Mr. Backman or Mr. Erenst, I'm not sure how you want to proceed, but please go ahead.

Mr. Vincent Erenst (Managing Director, Marine Harvest Canada): Thank you, Mr. Chair, and members of the committee. Thank you for your invitation to testify before you today.

[*Translation*]

My name is Vincent Erenst and I am Dutch. I am accompanied by my colleague Mr. Clare Backman, who is the director of sustainability.

[*English*]

As to my background, I hold a master's degree in science from the University of Wageningen in the Netherlands. I've worked in aquaculture since 1984, in various countries and with a variety of species. I would also like to say that in the first 10 years I worked in closed land-based systems.

Before I let Clare speak to the environmental practices of our company, I'd like to give you some background on our company and make some comments on the testimony that has been presented to you in earlier sessions of this committee.

Marine Harvest is the largest salmon farming company in B.C. It produces around 50% of the salmon grown in the province. We have 550 employees, and together we grow 40,000 tonnes of salmon per year. Our sales this year will be around $250 million Canadian; 30% of that is sold in Canada and 70% is sold in the U.S. We operate 41 farms; each holds between 400,000 and 500,000 fish, but there are never more than 30 to 32 farms stocked. The others will be lying fallow for a period of two to six months.

We also operate six hatcheries. Three are recirculating land-based closed-system hatcheries, where we grow our smolts. All our eggs come from our own brood stock, which is here in B.C. We do not import eggs, and we haven't done that for many years. We have two processing plants where all the fish that we produce are packed and processed.

Our business is profitable. Over the last five years we've had very strong cashflows. We reinvest a lot into our business here in B.C. to make it more robust and more sustainable; however, we have not been investing in growth for the last seven years, basically, as this has not been a possibility.

Our company is part of the Marine Harvest group. This company had its origin in Scotland in the 1960s; it became part of a Dutch group in the 1990s, and since 2007 we have been a publicly traded company listed on the Oslo Stock Exchange. We are listed on the Oslo Stock Exchange because that's the best stock exchange for fish-farming companies. In the same way that mining companies are often listed on the Toronto Stock Exchange, fish-farming companies are typically listed on the Norwegian stock exchange.

We have 16,000 shareholders and, believe it or not, the majority of the shares are owned by institutions and individuals who are not Norwegian. Interestingly enough, some of our shares are in fact owned by Canadian NGOs, and they can look forward to a healthy dividend this year.

Contrary to what you've heard in earlier testimony, in B.C. we are really a Canadian company. Our staff is 98% Canadian. With the exception of myself—I'm Dutch—and three Chileans, we're all Canadian. The management of the company, again apart from myself, is fully Canadian. About 90% of everything we buy comes from Canada, and a very large part of that comes from B.C.

It has also been said that we don't hire people locally and that we pay low wages. I can tell you that the large majority of our employees are from the northern half of Vancouver Island, where we are today the largest private employer. The remainder of our people are from the first nations community in Klemtu, and in that area, where we operate five farms and a processing plant, virtually all our employees are from the local community.

As to wages, our hourly employees, after one year of employment, make between $18 and $30 an hour. They have extended health care and all the benefits, including a pension and an annual bonus.

It has been said that we are very secretive about our practices. This is definitely not true. We regularly report to our regulators with a great amount of detail. The corporation publishes an annual sustainability report that discloses a lot of information to the public. Marine Harvest Canada, this year, will publish its own sustainability report in August or September. It will have a lot of detailed information on our operations here in B.C.

I'd also recommend that you have a look at our website, marineharvestcanada.com, where there's a tremendous amount of information on how we grow salmon, where we grow them, their numbers, and so on.

Last but not least, in fact Mrs. Morton regularly writes us emails and regularly calls us. We always answer her and we always give her full information.

● (1700)

Before turning it over to Clare, I would like to invite all of you to come to B.C. and have a look at our operations. You can see a closed-containment freshwater land-based operation. Mr. Donnelly has already done so, and I would be glad to welcome a few more of you.

Mr. Clare Backman (Director, Sustainability, Marine Harvest Canada): Good afternoon, Mr. Chairman and committee members.

Clare Backman is my name. I'm a registered professional biologist. I have a bachelor's degree from the University of British Columbia. I've worked for both levels of government over the last almost 30 years, mainly in the field of salmon restoration, salmon conservation, and most recently, for the last 10 years, as the sustainability director for Marine Harvest Canada.

I want to go over a few points about our existing business and some of the ways that we are involved in environmental management, but before I do, I just wanted to straighten out a couple of points from earlier testimony.

I think on April 12 it was suggested that wild sockeye moving past farms in the early part of the decade, farms where the fish had an IHN virus, could have been negatively affected. The IHN virus is actually called the sockeye virus or the sockeye disease. Most sockeye salmon carry it in British Columbia, so it's not possible that they could have been exposed simply by passing by a salmon farm that was unfortunately experiencing that disease. That's just basic biology, which I think was left out at the time.

The second point is that it was suggested that sea lice on our fish are showing signs of Slice resistance. We have a chemical that we apply to the salmon, and I'll speak about that in a moment. Our company has seen absolutely no evidence of sea lice resistance to the Slice product. I'll cover that in a moment in a little more detail.

On April 14 the provincial veterinarian mentioned a couple of important things about sea lice and about the differences between Atlantic and Pacific sea lice. I'll just touch on those briefly. I think he mentioned that the Atlantic and Pacific *lepeophtheirus salmonis*, the sea louse of concern, is quite different in the Pacific from what it is in the Atlantic, as much so as chimpanzees and human beings are different genetically. He pointed out that this is likely the result of the experience that we've had in the Pacific area. The experience has been that the sea louse has not been the major concern on our Atlantic salmon here that it has been on Atlantic salmon in Europe.

Second, much of the research that has been done in the last few years has determined that Pacific salmon have the ability to mount an immune response to sea lice infection. They can actually shed the sea lice that are attached to them. The Atlantic salmon doesn't have that ability, so the Pacific salmon is actually less subject to damage than the Atlantic salmon is. Taken together, this information has led a lot of the researchers who are working on this area to now begin to see that sea lice are perhaps not as strong a problem as was originally felt.

It was also mentioned that the origin of sea lice is from the wild fish returning from the Pacific Ocean back to spawn. That's how they originally get onto the farms.

Having made those points, I don't want to suggest that we're not doing anything about the sea lice on our fish. We are in fact taking great measures to control and manage the sea lice. I brought along some information, and that information is contained in some papers that you can look at. They show clearly how our pattern of controlling sea lice ensures that the level of sea lice on our farmed salmon is very low when the wild fish are out-migrating as small juveniles. We're asked to meet a threshold of no more three sea lice per fish; we actually go much lower than that. You can see on the graph that during the spring season over the last number of years, the oviparous—that is, egg-bearing female—sea lice count on our fish has been maybe one or less than one.

The point I'm trying to make here is that we're paying close attention to managing our sea lice, and we're doing a good job of keeping the sea lice off our fish. Therefore, they can't transmit sea lice to the wild fish when they're out-migrating in the spring.

We're also participating with the researchers who are doing the work to look at the wild fish as well. I've provided information on those graphs to show you that the wild fish monitoring of the little guys when they're leaving in the Broughton Archipelago, which has been going on year over year, has also shown a precipitous decline in the infestation of sea lice on the wild fish. In 2008-2009, the DFO basically reported that there was pretty much zero effect, zero impact, from sea lice on the pink salmon in the Broughton area.

● (1705)

The point here is that the sea lice management is ongoing and it's effective.

I'll move a little bit now towards the issue of—

The Chair: Mr. Backman, I have to interrupt you. We're running very close in time. If we could move into questioning now, possibly we could cover some of your points through the questions.

Mr. Clare Backman: Absolutely.

The Chair: Go ahead, Mr. MacAulay.

Hon. Lawrence MacAulay (Cardigan, Lib.): Thank you very much, Mr. Chair.

I want to welcome all the participants.

Mr. Walker, are you involved in closed containment, or is it net fishery? Which are you involved in? If I understood correctly, you've shifted to closed containment for grow-out.

Mr. Robert Walker: That's correct. We've developed a solid-wall marine-based system, which we call a closed system. It is a flow-through. It's not a completely closed-loop system.

Hon. Lawrence MacAulay: Okay, thank you very much.

Can you tell me this, then? We've heard a lot of conflicting information on this committee. We have heard, of course, that the lice come from the wild; they carry the lice in. We've heard that the biggest problem with sea lice is the fish that are farmed. How would you respond to that?

Mr. Robert Walker: We don't have a lot of experience with Atlantic salmon. We've been primarily chinook salmon growers. As Mr. Backman mentioned earlier, the chinook salmon, the Pacific salmon, don't typically have issues with sea lice.

We've grown in a Future SEA bag at the Middle Bay site for about three years using chinook salmon. We found a total of three lice in about 150,000 fish there, so we know they're in the water, but they just don't seem to stick with the fish. It's a species issue, certainly, but it may be also a geographic location issue. It could also be the impact of the pumped sea water, which has higher oxygen levels than a typical net cage. There is certainly a lot of ground for research there.

● (1710)

Hon. Lawrence MacAulay: Mr. Backman, how would you respond to that situation that we've been hearing of here at this committee for a lot of months? We've seen demonstrations and pictures of fish that have been pretty well eaten by sea lice, and we were told that it's three per fish. It's hard to get a handle on just exactly where it is and whether it's much of a problem. Some experts would indicate to us that it's a major problem.

Mr. Clare Backman: The context I was trying to point out was that in Europe, with the differences in the sea louse and in the kind of salmon—not the Pacific, but the Atlantic salmon—there is strong concern about the effect of the sea louse on the Atlantic salmon. In the Pacific, where we have the Atlantic salmon being grown in the cages, we see less of a concern over damage to the fish by sea lice. The greater concern is the potential for an effect on Pacific salmon that might receive the sea louse from farmed fish.

What I was pointing out there is that, as the research has gone on, we've seen that the effect on the population of the Pacific salmon is not as great from the sea lice as was originally the concern.

Mr. Vincent Erenst: May I make one additional comment?

Hon. Lawrence MacAulay: Certainly.

Mr. Vincent Erenst: You've heard from Dr. Krkosek that in the Broughton Archipelago over the last couple of years, management of sea lice by the farms has been such that the percentage of sea lice on wild salmon is extremely low. What I'd like to extend is that what we do in the Broughton, we do exactly the same anywhere else, so at this point in time, although we have lots of data only about the Broughton, we do believe that the effect of sea lice from farmed salmon, given the way we manage our business today, is very small.

Hon. Lawrence MacAulay: Thank you very much.

Mr. Erenst, you indicated that your sales were $250 million this year. Is that correct?

Mr. Vincent Erenst: That's right.

Hon. Lawrence MacAulay: Is that in British Columbia?

Mr. Vincent Erenst: It's all produced in British Columbia, but 70% of it is exported to the United States.

Hon. Lawrence MacAulay: Mr. Walker has indicated that there's some concern about these operations leaving and going to larger or more highly populated areas. Do you have a concern about that?

I'd like you to elaborate on that, Mr. Walker.

Mr. Robert Walker: My feeling, and this is more of a personal feeling than a corporate one, is that it makes more sense—dollars and cents—to reduce your costs. If you're going to go to the expense of building a land-based freshwater system, you're already putting in high capital costs, so you will likely want to reduce things such as transportation costs for feed going in and fish going out. It just makes more sense to build closer to your market centres.

In British Columbia, we do sell or consume quite a bit of seafood, but we're certainly not the major market for the salmon grown in this province. I do have a fear that we'll see the emigration of business if we go to land.

Hon. Lawrence MacAulay: Thank you.

The Chair: Go ahead, Monsieur Blais.

[*Translation*]

Mr. Raynald Blais: Thank you very much, Mr. Chairman.

Good afternoon, gentlemen.

I would like to come back to the points I raised earlier with regard to seawater pens as compared to land-based tanks, and the size of these enclosures. I'd like to hear your thoughts on these enclosures.

Do you prefer the famous water-based pens, in salt water preferably, I suppose? I see that the majority of your fish farms are run in seawater and so I expect that that is your preference. I would like you to explain why.

My other point concerns the size of the facilities. I would say that if they are small, there are fewer dangers than if the operation is enormous or much larger. I would like to know what you think of that.

● (1715)

[*English*]

Mr. Vincent Erenst: Atlantic salmon have a freshwater stage and a salt water stage. Up to a hundred grams they grow naturally in freshwater; after that they have to move out to sea and they usually, in nature, grow in the ocean. It's true that you can grow Atlantic salmon in freshwater, but that's not without problems. The first phase, of course, is easy, because that is what is natural; the second phase, from 100 grams to five kilograms, involves some problems. If you think about land-based systems, one of the issues would be the waste. If you have salt water waste or salt waste, you cannot use that waste as fertilizer in agriculture; you cannot use it for anything, because it's salt, and the salt will destroy all crops. If you go land-based, you have no remedy, then, to go freshwater, and it also applies to a floating salt-water system. You will always have the question of where to go with your salty fertilizer.

As to the size, our typical farms nowadays are 2,500 tonnes of production in two years. It takes two years to grow salmon. I think the largest closed-containment system in the world, which is not salmon, is probably something like 300 or 400 tonnes today. There is a large-scale difference, and for Atlantic salmon or other types of salmon, the largest closed-containment system is probably not larger than 100 tonnes at this point in time. Does that answer your questions?

[*Translation*]

Mr. Raynald Blais: Mr. Walker, could you answer the same questions?

[*English*]

Mr. Robert Walker: I just wanted to address this salt-water waste issue. We did recognize early on that the waste would be a problem, and through DFO's AIMAP program we have been doing some research and development on desalinating the waste. I agree that it is a problem, but I don't agree that it's a long-term problem.

In terms of the size of systems, yes, there are not many.... We talked earlier about how few comparables there are. Our projected system at Middle Bay will have four tanks in the water that will grow about 600 metric tonnes of salmon each year, so it's a commercial pilot scale. If we wanted to compare it to the system at Cedar, which was a land-based flow-through system using much more energy, etc., we grew probably about 100 tonnes a year there. They're really different capacities.

The Chair: Thank you very much.

Go ahead, Mr. Donnelly.

Mr. Fin Donnelly: I'd like to thank our panellists for being here and offering their input. I would like to thank both operators as well for taking me on a tour of their facilities. At Marine Harvest it was the Cyrus Rocks facility that I viewed. At AgriMarine it was the pilot facility at Middle Bay.

I have a few questions for Marine Harvest, and a question for AgriMarine as well. I'll read all three for Marine Harvest and then you can respond. I only have five minutes, so keep that in mind.

First, I'm wondering why it hasn't been possible to expand your business. I understand you commented that you haven't been able to grow for seven years.

Second, the issue of sea lice seems to be a source of controversy. I'm wondering if you can comment on that and why you use Slice, for instance. Is it legal in Canada?

Third, why do you think there's such an outcry from the public on the west coast about open-net fish farming?

Mr. Vincent Erenst: I can take the question on expansion, and you can take the other two.

There simply haven't been any new licences issued over the last years. The last two licences were given to us in 2006, I believe. We have many more licences than we actually use. We have 70 licences and we only use 41. We only use those licences where the conditions to grow fish are the best, and that always coincides with the best environmental conditions.

We do not want to use the old sites again, with the exception of a few, so we have not received any new licences, apart from the last two from four years ago, and they have replaced all the licences we had before. That is why we have not grown our business. It's as simple as that.

● (1720)

Mr. Clare Backman: On the question of controlling sea lice and the use of a product called Slice, there are two ways that sea lice are controlled: either by harvesting the fish right out of the farms, or by applying a therapeutant milled into the feed. It goes by the trade name Slice. A very small amount is used to control the sea lice. It kills the sea lice on the fish. It's very effective and has a fairly long residual effect in keeping sea lice off the fish.

We use an extremely small amount of it. I think with the 43 million kilograms of farmed salmon we produced last year, we used 11 kilograms of emamectin benzoate, so very little is used.

It is an approved product for use in Canada. It is a legal product and we are currently using, as I said, very little of it. We're looking toward the opportunity to work with government agencies to expand our ability to use other products and not have to rely entirely on Slice going forward. That's a future research and development process.

You also asked about the controversy about salmon farming on the west coast and why it is so strong. It comes down to the fact that we have a really important and valuable resource in wild salmon on the west coast. Everybody, including myself, who lives out there wants to see the wild salmon maintained. Anything that has the appearance of threatening wild salmon comes under a lot of scrutiny.

Our business is placed in the common waters. We are called upon to operate with the highest degree of environmental caution. We're working through a process of demonstrating to the public and our regulators—soon to be the federal government—that we can operate to a high level of environmental conservation.

It's going to take some time to get those messages out. There are probably some things we need to change along the way as well. We're not saying we're perfect, but we're saying we're getting better every day and we're on the road to improvement for environmental sustainability.

Mr. Fin Donnelly: Thank you.

I have a quick question for Mr. Walker.

Many have commented that closed containment is not economically feasible, yet you seem determined to operate in closed-containment facilities. I'm just wondering if you can briefly say why.

Mr. Robert Walker: Most of the comments are probably looking at land-based closed systems. We've done a lot of modelling, and we feel that our capital costs are going to be lower on a price-per-kilo-produced basis than for a land-based system. It starts making sense right off the bat.

From an operating perspective, we're at least as competitive as the current net-cage operators. Having said that, it's all modelling based on some limited experience to date. Talk to me in two years and I'll give you a much better answer.

Mr. Fin Donnelly: Why aren't you using—

The Chair: Thank you.

Go ahead, Mr. Calkins.

Mr. Blaine Calkins (Wetaskiwin, CPC): Thank you, Mr. Chair.

I appreciate the opportunity to participate in the discussion. I wanted to ask some questions. I think what I'll do is simply lay them on the table, so you might want to have a pen handy in case I go too fast.

I'm concerned because first of all, I don't see how an on-land facility that pipes in salt water and returns the used salt water back out to the sea would mitigate or change many of the issues that we currently face, unless we talked about massive filtration systems and the application of pharmaceuticals to keep the interaction.... I mean, when you bring in the water, you're bringing everything with it, so I don't know where that's going.

I think we're talking about three different things here.... There are only two different things. There is a completely closed and contained system, and there's a system that interacts with the ocean. If any of you can share any experiences with me on that, I'd like to know if any study has been done or if any information is available on the quality of the product. When you're talking about something that's grown in the ocean, and when you're talking about wild, and when you're talking about farmed in an open-cage pen versus when you're talking about farmed in a closed-containment system, I would guess there would be significant quality issues to deal with there.

Mr. Backman, I think you mentioned in your testimony that Pacific salmon are more resistant to the Pacific sea lice than the Atlantic salmon are. I'm wondering if that applies evenly across the five Pacific salmon species, or if there are variations within the five Pacific salmon species. Perhaps you can elaborate on that. I would like to know about your brood stock program. What do you do to maintain a healthy genetic diversity? You're saying that you're not importing any genetics right now. If you could tell me how you maintain a healthy genetic diversity for your stocks on the west coast, that would be great.

I heard testimony from a witness last week. I asked basically if a young juvenile salmon, a pink, could leave the Fraser River and swim north between the mainland and the islands and not go through an area of effect. He gave me a number; he said that the footprint of a salmon farm is about 30 kilometers in diameter. I don't know if that's necessarily true, but he said that if that were the case, no salmon could swim without going through an area of effect.

Could you tell us what your information is insofar as the area of effect of a salmon farm? Perhaps you could enlighten the committee on what measures you have taken to mitigate any interactions with seals, aquatic mammals, and so on to address some of the concerns that we hear about dolphin and whale interactions, and talk about some of the issues pertaining to that and to the release of the Atlantic salmon into the wild.

Thank you.

● (1725)

Mr. Vincent Erenst: I'll take the questions on closed containment, and I could also take brood stock, if you take the rest.

We at Marine Harvest believe that if you want to go to closed containment, you have to go land, and you have to go with recirculating aquaculture. That means that most of the water in your system recirculates time and time again. You'll only exchange something like 3% to 5% of new water in your whole system every day.

Why do you have to recirculate? These installations are extremely expensive. In order to sort of counteract the cost, you'll have to do two things. First, you have to grow at a much higher temperature—probably at the maximum temperature for salmon, which is 13 to 14 degrees—in order to get much more growth. Your fish will grow twice as fast at higher temperatures than they do today. That will reduce your cost.

At the same time, you have to increase density from the current 5 to 10 kilograms per cubic meter to at least 40 to 50 kilograms per cubic meter to be able to get a return on your investment. I believe the two studies that have been quoted before actually have these types of numbers in there.

Again on closed containment, we are concerned about the quality of product when growing in fresh water. Typically in recirculating systems, you get what is called an off-flavour problem. Some flavour builds up in the fish. You can get rid of it, but during the last four to six weeks you would have to flush your fish with sea water or other fresh water in order to get rid of that off-flavour. It's an issue. I personally believe there might be a solution, but there is a cost to everything.

As to brood stock, it's a different issue. We have three different lines of brood stock. We have a program to make sure there is no inbreeding, that we do not cross brothers and sisters and we do not cross families. We know that there is still more than enough genetic variability in our stocks to avoid inbreeding and we think we can go with that for many years.

Mr. Clare Backman: The question was also on the degree of sea lice resistance in the five species of Pacific salmon. I haven't been directly involved in that, but I have read and kept up with the studies there. The initial studies were done on very small salmon. The pink and chum salmon that travel to the ocean are very small in size, and because it was felt they were the most at risk from sea lice, the majority of the data are on the ability of pink and chum salmon to shed the sea lice and on the threshold beyond which they begin to be more resistant. That's mostly known for the pink and the chum.

More information is needed for the larger species. When I say larger, they're migrating as smolts at a larger size. These are the sockeye, chinook, and coho. I believe there is work starting or being done, as we speak, on those questions.

On the question about the footprint of the salmon farm and how far the effect would go, at this point it's a matter of conjecture. We know there are channels, both north and south, around Vancouver Island that don't have salmon farms. If fish are migrating through Discovery Passage or southward around the bottom end of Vancouver Island, they're not going to encounter a salmon farm. However, studies have been done on fish travelling around the southern end of the island by DFO scientists, who have noted that there are sea lice on those fish travelling to the south, so we have to recognize that there is an ambient level of sea lice.

In the BC Pacific Salmon Forum report, one of the recommendations was to ensure that our operations don't increase sea lice beyond the ambient level, so that's how we try to manage our farm operations. In that case, during that out-migration season when the fish are moving through those channels, they won't be challenged any more greatly by sea lice from wild sources than might occur from our farm sites.

Finally, about the other matters—interactions with cetaceans and with seals, pinnipeds—those are key areas where we operate. We try to keep the interactions to a bare minimum. We have to report any interactions like that. We don't see negative interactions with cetaceans. We are concerned that persistent seals and sea lions can create a situation in which we might have an escape of fish if they were successful in tearing nets, so although we manage our farms to avoid them, we sometimes have to destroy seals and sea lions. We report those, of course, to the federal government every year.

I think that covers most of what was....

● (1730)

Mr. Blaine Calkins: Yes, it does.

The Chair: Thank you very much.

Mr. Vincent Erenst: The other question was on the routes for wild salmon. If you were specifically—

Mr. Blaine Calkins: I think you have addressed it.

The Chair: Thank you.

Thank you very much, gentlemen.

Gentlemen, on behalf of the committee I'd like to thank you once again for taking time out of your schedules to appear before us today and answer the questions the committee members have presented to you.

On behalf of all committee members, thank you very much.

Committee members, before we break I want to briefly discuss something. We had committee business scheduled for today. The item to discuss was the potential travel to the east coast. I appeared before the Liaison Committee on Thursday and made a presentation. The Liaison Committee recommendation was that we reduce the number of members travelling to eight from the present 12. We have not received any approvals from the House at this point and we are awaiting that permission.

Go ahead, Mr. Byrne.

Hon. Gerry Byrne: First, Mr. Chair, I think you can excuse our witnesses.

The Chair: It was just in the interests of time....

Hon. Gerry Byrne: What's the problem with the House?

The Chair: The Liaison Committee makes a recommendation to the House, and before the committee can travel we need to receive approval from the House.

Hon. Gerry Byrne: Mr. Chair, I don't want to betray any confidences from an in camera session, but it has been my general understanding in my 14 years here that when chartered aircraft are used for travel.... I think the liaison committee's recommendation was based on an austerity measure in trying to limit or reduce costs associated with committee travel. It's my understanding we are going to be travelling using a chartered aircraft.

The Chair: That is correct, or that is the proposal.

Hon. Gerry Byrne: Now it has been cut back from 12 to eight. It has been my experience in the past that the incremental cost of having a full complement of committee members is no higher, relatively speaking. Obviously there are hotel and per diem charges, but the largest amount of the travel expenditure is actually for the charter aircraft, and if we were to go with a 12-member complement, the actual incremental savings of reducing to eight would be relatively non-existent.

● (1735)

The Chair: In general your theory makes sense, Mr. Byrne.

I believe you have been supplied with a copy of a revised budget that takes into consideration eight members travelling. The cost has been reduced substantially by the reduction from 12 to eight members, and the rationale for that is that the number of aircraft required is the same, to be very frank with you, when you have 20 members as when you have 16—I shouldn't say members, but people—participating in the mission. It does reduce the number by about $21,000.

Go ahead, Mr. Calkins.

Mr. Blaine Calkins: Mr. Chair, I'm concerned. I think this calls into question my privileges as a member of Parliament and as a member of this committee when the liaison committee decides, whether it's an austerity measure or whatever the case might be, to limit the capacity of the committee to travel as a whole to have our discussions.

I'm greatly concerned about that. I'm greatly concerned about the fact that while we reduced the number of members of Parliament who might be able to travel, we don't seem to have any mechanisms to reduce the number of accompanying staff. I know we do need certain staff to accompany us, but I sometimes wonder if we don't go overboard on that, and I've never, in the time that I've been here, heard any discussions as to why it takes eight staff to go with eight members when it takes eight staff to go with 12 members. It doesn't seem to add up to me. Could I get some clarification on that?

The other thing I would mention is that if this decision needs to be made right now, then we should probably work towards making a decision, because there are other things we need to do, and we're past our 5:30 time. If we could defer a decision and a discussion on this to the next meeting, that would please me greatly.

The Chair: There's no decision required at this point in time. As I said, I was reporting back to you on my meeting with the Liaison Committee. There has been no approval on this trip at this point in time because we need to have secret approval from the House, but there is no decision required at this point in time.

Go ahead, Mr. Andrews.

Mr. Scott Andrews: Just to echo what Mr. Calkins and Mr. Byrne said, according to my quick look-over of this budget, you're only saving $2,300 by cutting four people. I don't buy the part about the plane costs, because I think it's the same plane cost that was in the budget we saw last week. I wish I had last week's budget here.

The Chair: There has been a reduction of $21,000 from last week's budget to this one. The reason is that we reduced the number of aircraft required to be chartered. I shouldn't say “the” reason, but that's the main reason.

If there is no further discussion, we'll continue with this on Wednesday, and possibly we will have heard from the House at that point in time.

The meeting is adjourned.

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