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## **Standing Committee on Fisheries and Oceans**

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**EVIDENCE**

**Tuesday, November 1, 2011**

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**Chair**

**Mr. Rodney Weston**



## Standing Committee on Fisheries and Oceans

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• (1535)

[English]

**Ms. Ruth Salmon (Executive Director, Canadian Aquaculture Industry Alliance):** I'll start.

Thank you, Mr. Chairman, for the invitation to address the committee today on the topic of closed containment.

My name is Ruth Salmon. I am the executive director of the Canadian Aquaculture Industry Alliance. It's a national industry association headquartered here in Ottawa. We represent both shellfish and finfish operators, as well as feed companies, suppliers, and regional aquaculture associations. Collectively we probably represent about 90% to 95% of the industry in Canada.

I would like to introduce my colleague and a CAIA board member Mr. Clare Backman who is joining me today. Mr. Backman is the sustainability director at Marine Harvest Canada. He is very knowledgeable on the topic of closed containment and will be sharing his company's perspectives with you after my opening comments.

Just as a little bit of background context for some of the new members, the aquaculture industry now generates \$1 billion in sales annually and its gross value is \$2.2 billion. We account for one-third of the total value of Canada's fish production and we operate in 10 provinces, including the Yukon. With the depletion of stocks in the traditional fisheries, aquaculture has become an important employer and economic mainstay in many coastal rural communities in Canada, as well as aboriginal communities. We currently employ 14,500 people.

Unfortunately, the size of the industry is not going in the right direction. In fact, production in 2010-11 was less than it was in 2001-02. Mr. Backman will be addressing this a little bit more later, but closed containment is certainly not going to help take it in a more positive direction.

Before we get into that I want to step back for a minute and ask the question, why would we want to grow salmon in tanks on land in the first place? To answer the question, we really need to think about the early forays into closed containment of Atlantic salmon. At that time, it was really more about farmers wanting to address business risk, business risk that obviously occurs when nets are moored in the ocean.

There are really three major business risks that I want to quickly highlight. The first one is that if our fish are exposed to a disease or a parasite transferred from wild fish, they can die. They can also die from water quality issues, either naturally occurring or man-made

pollution. Naturally occurring issues include dissolved oxygen, for example. Our fish can also be killed by predators, or they can escape due to large storms. There are a number of issues that become a business risk for farmers.

This was all addressed in the Canadian Science Advisory Secretariat process that the DFO talked about last week, the CSAS process, to provide you with some context. Addressing business risk is still really appropriate and of interest to the farmer today, but the current focus on closed containment is more now about avoiding any impacts to the environment.

Mr. Backman and I are here today to challenge the assumption that net-pen aquaculture is not environmentally sustainable. In fact, last week in DFO's presentation, I heard Mr. Kevin Stringer state that we have a safe environment now with adequate protocols in place.

Industry agrees with the DFO that current practices for salmon aquaculture using net-pen cage technology in the ocean are both sustainable and responsible. This industry operates under some of the strictest regulations in the world. Our production systems meet or exceed provincial and federal regulatory standards and requirements for both environmental and fish health standards.

There's no question that net-pen aquaculture results in impacts on the environment, as does any activity. But each and every impact has been assessed and found to be insignificant when subjected to careful risk management processes. This is the function of the Canadian Environmental Assessment Act screening, which does review salmon farms. The CEAA considers and reviews the location of a farm, and it reviews the species and whether the production level is appropriate. This, together with ongoing monitoring that industry and government does, gives us the confidence that in fact we are farming sustainably and responsibly.

It's our organization's experience that critics of salmon farming often impose the argument of closed containment in order to attain a level of conservation and protection that calls for extreme measures, which are often not required for other aquatic users and go beyond the good governance of the existing regulatory structures.

• (1540)

That being said, industry is interested in further research and pilot testing of innovative technologies that could assist with our environmental performance and/or business risk. In fact, for the last 10 years the industry has been on a road of continual improvement, and we are a better and more sustainable industry today than we were 10 years ago, and will be even better in the future.

It's with this fundamental understanding of the sustainability of our industry and the appropriate place for closed containment aquaculture systems that we provide information on the status of the technology to you today.

With that, I'd like to pass it along to Clare Backman.

**Mr. Clare Backman (Director, Sustainability, Marine Harvest Canada):** Thank you, Ruth, and thank you, Mr. Chairman, and members of the committee.

It's good to be here again. I have a couple of quick points to make on the company, Marine Harvest, as I haven't met some of you before.

Marine Harvest is the largest producer in the world of farmed salmon, accounting for about a third of the farmed salmon produced. In British Columbia last year, we produced 40,000 tonnes, and we employ about 550 people on the coast of British Columbia.

I like to think of us as scientists and biologists who have become farmers of fish in the ocean, because we have a very strong affinity to the environment where we grow our fish. All of the fish I mentioned—those 40,000 tonnes—were grown in floating net pens.

We're here today to talk about closed containment, because we're very interested in the technology of growing fish in a closed system for the benefits it offers farmers. It has become more and more a part of how we grow our fish. Right now all the fish we put into the ocean spend the first third of their lives growing in a closed system. I'll be touching more on that as I go forward.

In addition to the fish we harvest right now being in a closed system for the first third of their lives, 50% of our brood stock grow to beyond harvest size in a brood stock facility in British Columbia. So we have some knowledge of how to grow fish to a large size, as well as a small size, and some knowledge of the challenges involved in that.

Let me just touch on a couple of points that were made by other speakers last week on this subject, and then I'll move on to our own experience. It was mentioned that the DFO study in 2010 looked at a number of closed containment systems and found two of them to be financially viable. They were the net-pen production and the recirculating aquaculture systems. I think the comment was made that the return on investment was 53% and 4% respectively. The capital costs to get the water in the net water pens and RAS systems were \$5 million and \$22.6 million. This was in the DFO's 2010 report.

Keep in mind that this was the average situation. When they went to the worst case scenario and factored in all of the things that could go wrong, net pens remained profitable, dropping from 53% to 27%; whereas the RAS systems dropped down to a -23% return. That is why the international community continues to work with the net pens to make them increasingly more sustainable, and is reluctant to move in great measure to recirculating aquaculture systems until we have a lot more certainty about the return on investment.

Why is Marine Harvest interested in closed containment? We have an interest beyond our activities in hatcheries and with the brood stock. We've also been engaged with the environmental movements in British Columbia for the last six years, looking at a number of

sustainable projects. One of them is a project on how viable it is to actually do closed containment for commercial-level Atlantic salmon production. That's going to require demonstration projects, as you've heard already.

It's going to take demonstration projects, because most of the production we can currently look at is small scale, whether we're talking about SweetSpring's coho production in Puget Sound; Swift Aquaculture in Agassiz, B.C.; or some of the projects that are at the planning stage, like the one by the Namgis First Nation in Port McNeill, a planned RAS facility that hopefully will begin construction next year; or others across North America that we've heard about. For instance, a Hutterite community is planning a 1,000-tonne production in the Midwest, and there's also a 1,000-tonne coho facility being planned for the Lower Mainland.

These are all exciting developments that will help us learn more about closed containment and how applicable it is to growing fish.

• (1545)

I want to point out that all of those taken together add up to the production from one conventional net-pen farm. These will all go through a struggle to achieve the kind of production they're planning to achieve, and they will not add significantly to the production base of farmed salmon in British Columbia.

We're looking at meeting a 3% to 5% growth market in the United States. We need a new farm at a 3,000-tonne level every couple of years. We won't get that from all of this material currently being looked at in terms of closed containment facilities. In fact, we may fall behind if we're not able to continue to grow both the conventional nets as well as invest in these new structures.

I just have a couple of points on the marine harvest plan. We have developed a pilot proposal to actually test closed containment in a recirculating aquaculture system in order to assess its feasibility for growing fish to market size, given the current state of technology development in British Columbia.

We undertook a site survey plan and a review of the current engineering, done by an engineering company in Victoria, B.C., Worley Parsons.

Interestingly enough, the site survey looked at 16 locations on the coast of B.C., where we seem to have all the water in the world we could ever want. Of those 16, only two were found to have water of sufficient quality and quantity to be useful for an RAS facility. That is because, although the facility recirculates most of the water, it still requires a significant amount of water on a day-to-day basis for things like cleaning, cleansing the fish from off-flavours, and the makeup of the water. It's not as easy to find a good location as one might think.

The second thing that came up was that the available engineering has basically reached the stage of being doable, but it still is very expensive work to invest in. Our exploration for a 2,500-tonne farm looked at making about a \$35 million investment before taking into account the cost of land, as opposed to \$5 million investment for a net pen, according to the DFO report.

I know I'm running to the end of my time, and I'll have to make time for questions. I'm just going to ask where we see all of this going. What is the bright light going forward for this technology and for farmed salmon in general?

I see a blend of cultures going forward, in terms of culture styles. There is going to be the net-pen culture, which will continue to become more sustainable, growing in the ocean off British Columbia. There are going to be fully closed systems, like we're talking about here today, which are going to meet those markets willing to pay for that product and those consumers who wish to purchase that product.

And there's probably going to be a blend of the two. For example, my company is looking at having our fish in closed systems even longer than they now are, going from the 100 gram smolt entry size to perhaps half a kilogram or a full kilogram, or maybe even larger. Why? That way we will reduce the time our fish are in salt water, maybe getting them down to less than a year, or maybe 10 months. That's good for everybody. We are not exposed to the vagaries of the salt water ocean, and the fish are not in the ocean with the attendant environmental impacts that everyone is concerned about.

With that, I'll end our comments and turn it over to you, Mr. Chair.

**The Chair:** Mr. Stechey, do you have some opening comments?

• (1550)

**Mr. Daniel Stechey (President, Canadian Aquaculture Systems Inc.):** Mr. Chair, I don't have opening comments, per se, but I will just take a moment to introduce myself. My name is Dan Stechey. I started Canadian Aquaculture Systems in 1984, when the Canadian aquaculture industry was worth \$7 million, as opposed to the \$1 billion that Ruth just talked about.

For the past 27 years, I've been engaged exclusively in aquaculture, providing help with design, management, and productivity for our clientele throughout North and South America and the Caribbean. I've lost count of the number of projects we've worked on during that time. We do a fair bit of work, as well, for provincial and federal governments, particularly on the strategic policy area.

From 1992 to 1996, I put Canadian Aquaculture Systems in trust at the request of the Canadian Aquaculture Producers Council, the predecessor of CAIA, and the government of the day. It was a joint request. I served as the first director of aquaculture at the Department of Fisheries and Oceans, where I was the principal architect of the federal aquaculture development strategy. During that four-year period, we established a lot of policy and made some regulatory changes to help move the aquaculture industry forward.

From 1999 through about 2004, I also served as an internal consultant to the Office of the Commissioner for Aquaculture Development.

I'm honoured to be here to help this committee in its work. I think it's important work. You've got a lot of information to review. You need to make some key decisions for the benefit of this entire country, not just one sector or another.

I'm happy to answer questions to the best of my ability. Please feel free to ask anything that I may be able to help with.

**The Chair:** Thank you very much. We appreciate that.

We'll move right into questions with Mr. Allen.

**Mr. Mike Allen (Tobique—Mactaquac, CPC):** Thank you very much, Mr. Chair, and thank you to our witnesses for being here today. It's always good to see you.

I have a few questions. Hopefully, I'll have time to get them all in.

Ms. Salmon, one of your comments was about the business risks, that the whole first foray into closed containment was all about managing the risks. One of them was with respect to the disease aspect of it. We've recently engaged in some debate on ISA, and we had some of that challenge in Atlantic Canada at one time.

I would like to know your perspective on that issue at this point in time, that is, the perspective of your producers. Maybe more specifically, what are some of the things you're doing right now to protect against that or what are some of your action plans regarding ISA?

**Ms. Ruth Salmon:** It might be more appropriate, if you don't mind, for me to pass it on to Mr. Backman, because he's been involved in that in British Columbia. I'm certainly involved as well, but I think Clare might be able to respond more appropriately.

**Mr. Clare Backman:** Sure. I think it's important, first of all, to put this into a bit of context. Then I'll answer about what our plans are at this particular point in time and how we plan to look at this going forward.

The context is that everyone has received information that two fish out of 48 samples sent to a lab in eastern Canada returned a positive test result for ISA. Now, what does that mean? Well, it stands in contrast to our existing testing done on our farm sites. What I'm talking about here is the government of B.C., and now Canada, who have a random audit program that involves their going to farms in British Columbia and taking samples of fish every month. They've been doing this for years and years, and have examined 4,700 samples since 2003, with 70 more added each month, for a variety of diseases, including the presence of ISA. All of those samples have been examined for the presence of ISA. All of them have come back negative. It means that we as an industry are in the position of having a lot of information from all of our farm sites, all of which have shown no ISA. So we're surprised by the positive test.

The other thing is that the information we have about ISA and its effect on wild salmon in the Pacific region is that it has a very low effect, almost insignificant. The studies that have been done with Pacific salmon and Atlantic salmon exposed to ISA show that the Atlantic salmon suffer greatly, and the Pacific salmon not so much—it's almost insignificant for them.

This makes us very curious about these tests. We want to see the tests replicated, which is the normal process when you get a positive. You do an independent test to find if the result is replicated with another positive test. Then if you get that test, which is a tiny piece of the DNA indicating that you might have that virus, you move to replicating the entire DNA of the virus. None of this has been done yet.

If this is done and we know what variant of ISA it is, then we can start to discover the next steps that are going to be useful. From our perspective, we certainly don't want to see ISA transferred to our farms, so we would want to see if this is a pathogenic or a non-pathogenic form, and what steps we need to take to make sure it's not going to be transferred to our farms and our fish.

In parallel, we want to ensure that the public knows that these 4,700 tests are not wrong. We're perfectly willing, and are starting to take steps now, to step up the amount of testing on our farm sites, to ensure that we can verify even more samples than the 4,700 we have had over time and know what's happening today on every farm site so that we can be doubly sure that we don't have it on our farm sites.

As I say, beyond that, we need to know what this is and what steps can be taken. In the past, our industry has successfully developed vaccines that we inject into our fish to protect them against locally and naturally occurring bacterial infection. In the case of the IHN virus carried by sockeye in British Columbia, we developed a vaccine against that. So that's something that we would look to down the road as a management response, but until we have all of this other information.... We need to get the results of the tests.

● (1555)

**Mr. Mike Allen:** Is there any timeline on when you expect this testing to be available?

**Ms. Ruth Salmon:** There was an excellent press release by the federal government a couple of weeks ago, saying that none of this had been confirmed and that CFIA was taking steps to do a comprehensive study. At that time, they said the tests would take four to five weeks. We're trying to work with them and provide more samples, if necessary, and we're looking forward to that information.

**Mr. Mike Allen:** Mr. Backman, you also talked about the fish that you raise spending the first third of their lives in the hatchery, and then you talked about your brood stock. I have a producer in my riding who raises brood stock as well, Gray's Aqua. You talked about the challenges of doing that.

Some of the comments that were made by DFO the other day suggested that we'd need to raise fish in around 50 kilograms per cubic metre of space to make closed containment work. What are some of the challenges that you see in raising the brood stock? I don't imagine you're packing them in at 50 kilograms per cubic metre. Could you talk a little bit about that?

**Mr. Clare Backman:** We're growing our smelts currently at about 50 kilograms per cubic metre, or 40 to 50, and that's to make the most efficient use of those hatchery facilities in recirculating aquaculture for our hatcheries. For the brood stock, it's not so much. We're growing those in recirculating facilities, but much lower densities, maybe 10 to 15 kilograms per cubic metre. The reason is that each fish has quite a high value, because it carries the eggs and milk for the next generation.

In our engineering proposal for the pilot that we're considering, in order to get the combination with the best chance of being economically viable, we have to operate at 80 to 90 kilograms per cubic metre for an extended time. That's higher than we're used to, though not as high as has been done by some test groups that have gone to maybe 100 kilograms. But we have to hold at 90 for most of the life of the salmon; plus we must have essentially zero mortality

while we're doing it. So things have to go just right to get the best viability output.

**The Chair:** Thank you.

Mr. Donnelly.

**Mr. Fin Donnelly (New Westminster—Coquitlam, NDP):** Thank you, Mr. Chair, and welcome to our guests.

I wanted to pick up on Mr. Allen's question about ISA and salmon disease, or disease in general. I understand this would be a concern to your operations. Some scientists are already pointing the finger at aquaculture and making claims about the eggs. They say the virus must have been from imported eggs or that it could have come from the Atlantic salmon. This will be revealed shortly, I hope, because it would affect farm salmon and wild salmon. It could be a pretty disastrous situation for the Pacific salmon.

I'm wondering if you could comment on whether operating in closed systems would have any impact on preventing the spread of disease.

● (1600)

**Mr. Clare Backman:** Mr. Donnelly, both the open nets and the closed systems prevent the disease from occurring. Every fish we grow in our hatchery has to have a disease-free status the entire time it's there. But the testing that we've done for this virus shows that our fish that come from the hatcheries and then go into the ocean are completely free of this virus. So in this case, there is no difference. But in a general sense, the fish in the closed systems, by virtue of the type of culture we must have there, are 100% free of disease.

**Mr. Fin Donnelly:** You mentioned the need for expanding the market and the industry. Thinking of British Columbia over the past five to ten years, can you talk a little bit about how many new licences have been granted to fish farms in B.C.?

**Mr. Clare Backman:** I've been working with the present company for 10 years, and in that period of time three licences have been issued, the last of them in 2008. So in 2007-08, there were three licences issued, two of them to my company, and one to the Greek seafood company. There's been a hiatus since 2009, largely due to the shift in the regulatory regime from the province to the Canadian government.

**Mr. Fin Donnelly:** So there have been two or three over the last 10 years?

**Mr. Clare Backman:** Since 2008, so that's within the last four years.

**Mr. Fin Donnelly:** And were there others previous to that?

**Mr. Clare Backman:** Yes.

**Mr. Fin Donnelly:** I'd make a comment on some of the statements you've made, namely, that I would take it that nature does a pretty good job of producing salmon and containing its waste for free, and that it gets harder to replicate that system, whether with open nets or closed containment systems. That's more of a comment than anything else.

Moving to marketability, in your opinion would moving to closed systems increase or reduce the marketability of your product?

**Mr. Clare Backman:** I'll take a shot at answering that, but I should probably pass it over to Mr. Stechey as well, if he wants to comment on it.

There is a part of the market that is looking for a unique and more environmentally focused product. So it is true that this product attracts the attention of those segments of the marketplace. It is a small part of the marketplace at this point in time. For example, the 40,000 tonnes that we produce on an annual basis would completely saturate the market that's looking to receive this kind of product and, I have to add, is looking to pay a premium price that goes along with representing that.

So our interest in the pilot project is not as much to address that market as to put actual knowledge to the costs of growing fish in a closed system.

Dan.

**Mr. Daniel Stechey:** I don't have much to add, but I would concur with that.

I don't see the marketing of closed containment salmon, or any fish in particular, as any different from marketing free-range chickens as opposed to traditional broiler chickens, or marketing organic product versus product raised on a conventional farm. It has a market niche. There will always be demand in that niche. Hopefully that demand will pay the premium price that is offered for that product. I think that's as simple as it gets on the marketing side.

I don't see our converting the North American or Japanese markets to having a very strong demand for closed containment salmon over net-pen salmon. I just don't see that as a reality.

• (1605)

**Mr. Fin Donnelly:** As a quick follow-up, there seems to be a limited number of licences and a small niche—just thinking about the west coast of Canada, anyway. For instance, closed systems would provide only a small niche.

Are we at a standoff then in terms of industry expansion, or do you see the federal government looking to approve open-net systems to continue to satisfy this growing demand around the world, or wherever that demand is?

**Mr. Clare Backman:** I certainly do see the federal government looking carefully at open-pen applications going forward, but those that satisfy both the increased conditions of licence—which are extensive—under the new federal regulation, and at this point in time, the Canadian Environmental Assessment Act screening, which we've been subject to now since the middle of the 2000s. So yes, I do see that.

As I said at the end of my opening statement, I see a blend of these kinds of technologies moving forward. I don't think people are going to stop being interested in closed system product, but as I mentioned, the volume of that product coming forward for development is very small and will in no way meet the existing or growing demand from our major market, the United States, and the growing demand in Canada.

**Ms. Ruth Salmon:** To add to that, Mr. Donnelly, I think it's important to look at the big picture here. As I mentioned, our

production is actually going in the wrong direction. Other countries are growing at an annual rate of 6%. There's a huge demand.

As we know, the traditional capture fisheries are not going to be increasing in volume. To feed the people and to meet that seafood demand in Canada, as well as internationally, it has to come from aquaculture. Canada has a huge potential for playing a role there. We aren't doing a very good job in comparison to our competitors, but we have that potential.

We have a strong regulatory system. We will continue to improve our sustainability, as Mr. Backman said, but we already are a responsible and sustainable industry. We could be doing more to play a role in food security, as well as employing coastal and rural Canadians.

I think that's the big picture we need to be looking at.

**The Chair:** Thank you very much.

Mr. Leef.

**Mr. Ryan Leef (Yukon, CPC):** Thank you very much.

And welcome here today. I'm going to follow up on a bit of the marketing aspect. I think you did a great job covering what I was going to ask about the niche market. I was even going to talk about free-range chickens, but you got me there.

I see that B.C. farmed salmon exports were valued at about \$354 million, which was a 3% increase over 2007. Some of that higher demand is stemming from lower exports by Chile to the U.S., which is a gap that we've filled.

Do we know if that trend is going to continue? Have we been able to capitalize on that gap to build our marketing so it continues upward, that is, even if Chile's stocks return, Chile may not catch up to us again?

**Mr. Daniel Stechey:** If I could jump in for a minute, I've been in Chile six times this year, and I can tell you as a fact that the industry there is booming.

With regard to one of the companies I work with down there, when I first met with them in November 2009, their principal business was making cages and feeders. This has nothing to do with my work down there; I just want to tell you a story. At the time the general manager told me he had 132 employees. When I met with him last month, he had over 300 employees making cages and feeders. That industry is rebounding in a major, major way, so they'll be back on the market.

They had a setback, but the good news is that they'll be back at a higher price point than they were before. Their costs have gone up, and, as Mr. Backman indicated, they are now moving to land-based closed-containment systems for smolt production. That is going to increase their costs. It reduces the risk, but it increases their cost of production. But they're coming back, there's no question.

• (1610)

**Mr. Ryan Leef:** With that in mind, I heard Ms. Salmon talk about what we could do or where we could go.

Could you give us some ideas of what we could be doing? What could we do, as either government or industry, to help this industry in terms of jobs and support in the economy?

**Ms. Ruth Salmon:** That's an excellent question, and there are a number of issues in addressing that question.

One issue that our industry feels strongly about is that we're the only aquaculture producing country in the world that doesn't have national legislation. We don't have an aquaculture act. That's fairly significant because we are working under a fisheries act that, as you know very well, has focuses on conservation and protection. It doesn't really address what's required in a food production industry.

In fact, in talking to the DFO staff who were developing regulations in British Columbia over this past couple of years, we heard that they ran into major challenges trying to fit the regulations under legislation that wasn't appropriate for aquaculture. That's a significant thing.

What difference would that make? It wouldn't be a panacea, but it would provide a definition for aquaculture. It would clarify some things, as no federal legislation defines aquaculture. It would provide this government with a vision and, again, legislation that would protect the environment as well as attract new investment so we could create new jobs.

For the industry, that's probably the single most important thing right now. It would be a fairly low-cost initiative and it would have a significant impact on the industry.

**Mr. Clare Backman:** Another thing we can do as Canadians is promote the unique successes of some aspects of the existing conventional net pens. I'm going to give you an example in a moment, but the context here is that under the new regulatory regime, we are reporting lots and lots of information to the DFO, and the federal government is now making it transparent to the public, which is a good thing. It's a good thing because we're doing a very good job, though there could be more representation of it, which would help differentiate us from some of the other growing areas that aren't willing to release information transparently like this.

The example I'm going to give you is something that's close to my heart, because it's something I've been working on with my company. It concerns waste control. Fish have to go, when they're in the pens, and their waste tends to settle to the ocean floor. It's something that is reviewed under the CEAA, and it's something we monitor frequently to ensure that it's kept within allowable levels.

I'm going to give you a couple of numbers. Under the new regulation we are not allowed to exceed 4,500 micromoles of sulphide at a specific location close to the pens, and once we're finished harvesting we are not allowed to put fish back in until that level of sulphides has dropped to 1,300.

The good news story is that on our farms, among the companies on the west coast, we shoot for that low level as the maximum. We try very much to keep the level of waste below 1,300. Why? It's because then we have maximum flexibility to reuse that farm site as quickly as we can to get the maximum use out of it. That's a story that's little known. We cut into our profits, perhaps, but we're respecting the environment and maintaining our flexibility.

Those are the kinds of context pieces that could be developed under this umbrella of transparency that would put our industry in a very good position.

**Mr. Daniel Stechey:** Let me add one comment. You asked what the government could do to help this industry move ahead. I'm going to go at it with a little bit of a tangent, but it does involve aquaculture.

• (1615)

**Mr. Ryan Leef:** It will not be chickens?

**Mr. Daniel Stechey:** It will not be chickens.

Throughout this country we have a crying need to create economic development for aboriginal communities. If there is one industry that works in rural aboriginal communities where there is the resource base to develop an industry, it's aquaculture. Be it with thin fish, be it with shellfish, be it coastal, be it inland, there's a tremendous opportunity there. They do not have the capacity to engage in aquaculture, and that's something that needs to be addressed. This is a huge opportunity that this country is missing.

**Mr. Ryan Leef:** I appreciate that.

Thank you very much.

**The Chair:** Mr. MacAulay.

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

Mr. Stechey, you indicated that you have been in Chile a number of times and that aquaculture is expanding there, including the closed containment land-based units.

Why would they be expanding, when you look at the cost? Are they short of water, or why would they do this? Is it a precaution, or do they want to be sure they have the technology? What is the reason?

**Mr. Daniel Stechey:** Ruth commented earlier that one of the reasons for going to closed containment is to reduce risk. I think it was Ruth who made that comment. That's what it really is all about.

First of all, I want to be very clear. In Chile, where they are going to closed containment, it's for smolt production. It's not for production of market fish. It's for production of 100-gram fish during the freshwater stage of the life cycle to transfer into the ocean.

I should just add one thing on top of that. We have talked about smolt production a couple of times and we have talked about brood stock production. In my opinion, there is no technological limitation to closed containment aquaculture. We can grow fish anywhere, in any place on this planet, including in the middle of the desert. We can recirculate as much water as we want.

But aquaculture is a business, and at the end of the day we're growing fish to make money. When you do that, you have to look at the unit cost of what you're producing. When you're growing a smolt and you put it out, let's say for argument's sake, at a price of \$2, more or less, that's \$20 a kilo. Compare that with the market price of a large salmon.



You can pay for a lot of technology at that kind of market price. When you have brood stock worth hundreds of dollars a fish, you can pay for a lot of technology. When you're selling a commodity, the closed containment recipe is just not there.

**Hon. Lawrence MacAulay:** Basically, you've been in your business for 27 years, and then you were at DFO for four years. One of the things you do is to indicate whether these businesses can be competitive or not. I guess you've answered that, anyway. You just don't see any way.

When you could making a profit of some 50% plus, I just do not understand someone going to 4%—if everything is going well. It's only because we need the technology. Is that correct? Is it that we don't want to be behind the rest of the world?

**Mr. Daniel Stechey:** Let me put it this way, if I understood your question correctly, Mr. MacAulay. There are probably three reasons why we would go to closed containment. Number one is that the industry is regulated to do so. That happened in Denmark, for instance, with the trout industry. The trout industry was able to take an entire stream, divert it through a farm, and then put it back in the stream bed, essentially taking 100 to 200 metres of the stream bed out of a natural environment.

**Hon. Lawrence MacAulay:** But for salmon...?

**Mr. Daniel Stechey:** That was for trout. Eventually the government said, "Whoa, if this is going to continue, you need to develop recirculating technologies." The industry did that.

Another reason you would want to do it—coming back to the comments by Ruth and Clare—is that you reduce risk that way, or there is another strategic advantage to doing it.

Reducing the risk makes perfect sense. That's what Chile is all about. They were growing their smolts predominantly in lake cages—floating cages in relatively small lakes with a very high number of farms—and the disease issue just got ahead of them. They came to realize that they could not continue doing that. Now they're moving onto land, as has been done in Europe and North America.

**Hon. Lawrence MacAulay:** But can they be competitive?

**Mr. Daniel Stechey:** In smolt production, they can be, absolutely.

**Hon. Lawrence MacAulay:** But that's the only place that this can be competitive.

**Mr. Daniel Stechey:** Every smolt, practically, that is produced in Canada is done in closed containment systems today. It's the difference between producing a small fish that's worth \$20 per kilo, in round numbers, versus producing a market-sized fish that's worth 20% of that.

• (1620)

**Hon. Lawrence MacAulay:** Also, why is the closed containment or RAS system, as they call it, less expensive than one that would circulate the water from the sea and put it back into the sea?

**Mr. Daniel Stechey:** I wish there were a simple answer to that question.

Ruth mentioned the CSAS study. I was one of the authors of that study. In the chapter I wrote we looked at 10 different systems. The costs were extreme.

But I think the real issue that needs to be addressed with closed containment is the following. Let's come back to chickens for a moment, or hogs. Actually, I'll bring hogs to the table. For argument's sake, let's say that you wanted to start a hog farm. Barring any market factors and things like that, honestly, we could all get into a bus and go to look at five or ten hog farms. We'd see the same thing, more or less, five or ten times, and you could then go home and build your own farm. There's a lot of standardization in the industry.

I would argue that if you wanted to build a salmon cage farm, you could do the same thing. You could go and look at five or ten cage operations. You'd see the same thing ten times and could go back and build your own. You'd know what to do.

If I took you to five or ten land-based closed containment aquaculture facilities, you'd see ten or fifteen different designs, I guarantee it. There is no standardization in that industry, and the costs are all over the place.

About a month ago there was an innovation workshop in British Columbia on closed containment. There were seven or eight presentations on different RAS or recirculating aquaculture systems, for which the capital costs ranged from just under \$6,000 per tonne of production per year to \$25,000 per tonne of production per year. There is huge variability; there is no standardization in that part of the sector yet. We'll get there, but we haven't evolved and matured to the point that everybody agrees that these are the most efficient technologies to move forward with.

**Mr. Clare Backman:** I want to be sure I understand your question. You were asking why, in that early examination, the floating salt water facilities weren't as popular or viable as the RAS facilities.

**Hon. Lawrence MacAulay:** Yes.

**Mr. Clare Backman:** In our opinion it comes down to the fact that they don't control the internal environment of those floating facilities. There is still a lot of exchange of water, untreated for any of the concerns in the ocean, such as phytoplankton or low oxygen; it's still coming into the facility. Even though there is some ability to moderate this, it is still something they have to deal with, whereas in the recirculating aquaculture systems you pay the technology price, the capital price, but you have full control over the water your fish are growing in.

**Hon. Lawrence MacAulay:** You have the full control of the environment within those tanks, whereas in the floating ones you do not and, therefore, growth suffers. Is that what I'm understanding you to say?

**Mr. Clare Backman:** Yes, that's correct.

**Hon. Lawrence MacAulay:** Okay.

**The Chair:** Thank you, Mr. MacAulay. Your time is up.

**Hon. Lawrence MacAulay:** They don't give me any time.

**Mr. Daniel Stechey:** It's my fault.

**The Chair:** Mr. Cleary.

**Mr. Ryan Cleary (St. John's South—Mount Pearl, NDP):** Thank you, Mr. Chair.

Thanks to our guests for coming here.

Clare, you mentioned one of the challenges with closed containment aquaculture is finding a good location. The group we had here last week before the committee mentioned two other challenges, challenges that have also been raised here today. One is capital investment and the other is energy costs, because the energy that's being used to regulate the temperature of the water, for example, is incredible. It's enormous.

That got me thinking about my home province of Newfoundland and Labrador and, more specifically, southern Labrador. Southern Labrador, which has an aboriginal population, is obviously rural and has had its economic challenges since the collapse of the wild fishery. Southern Labrador will have cheap electricity within the next decade from Muskrat Falls, and it obviously is in close proximity to all kinds of water. So my question is whether southern Labrador would be a good fit for closed containment systems in addressing the issue of energy costs. We have the workforce there. But what's your opinion of southern Labrador and closed containment being a good fit?

• (1625)

**Mr. Clare Backman:** The quick response would yes and no.

What I mean to say by that is where you have low energy costs and you do a business case analysis, you will find it's more viable than where the energy costs are higher. Our case analysis demonstrated that for British Columbia, energy is a big concern. It's offset to some degree by the gains that you would get by controlling the environment and better feed conversion, and those sorts of things but it still is a very high cost and you still have to get a premium price. So where you have a reduced cost for your electricity, it could be more viable.

The no part of my answer was premised on whether or not it would create enough growth across Canada, or in Newfoundland, to satisfy the growth needs of the industry? As things sit right now, I don't think it will so alone.

**Mr. Ryan Cleary:** I just assumed that this technology would improve and we would get to the point where closed containment would work. I don't know if I'm right in that assumption or not.

But I have a second question. I'm told there is no such thing as a stupid question, so I hope this is not a stupid question. In terms of the cost of feed for fish in closed containment versus open net systems, is it the same or is the cost higher for fish in closed containment than in open net systems?

**Mr. Clare Backman:** It's higher.

**Mr. Ryan Cleary:** It's higher because you don't have fish circulating through open net is that why?

**Mr. Clare Backman:** No. You're specifying a food that has higher energy because you want the fish to grow as rapidly as possible, and you're specifying a food pellet that will not dissipate into dust when it leaves the fish as a fecal pellet. You want the fecal pellet to be somewhat cohesive so that it can be filtered out, because you're filtering all of that water.

So those kinds of things, which you're asking of the feed producer, do raise the price.

**Ms. Ruth Salmon:** If I could just answer your original question, I think another issue is the land base. When the British Columbia industry looked at the concept, the scenario, of taking the current industry and moving it on land, the current footprint of the industry would have had to be increased 40 times. Doing that on land, doing that close to power, and being potentially close to market requires a huge footprint that we don't currently have.

In New Brunswick they were looking at what it would take to replace the production there if they were to move everything on land. You're looking at 18,000 football fields, I think, is what they came up with. That's not insignificant; it's not a minor issue.

The other factor is fresh water. We now have a hugely growing population, and as I think was on the news last night, one of the major issues is lack of fresh water. Closed containment has huge needs for fresh water, which we don't have with current net-pen technology.

I think there are other factors here. The bottom line is this: if Canada wants to have a role in food security and in strengthening jobs in rural communities, closed containment may be a small niche but isn't going to provide what you're looking for in your province.

**The Chair:** Go ahead, Mr. Kamp.

**Mr. Randy Kamp (Pitt Meadows—Maple Ridge—Mission, CPC):** Thank you, Mr. Chair.

Thank you for your attendance. We appreciate the information you're giving us.

I just want to get back to a comment you made at the beginning, Clare, about the water needs. Ruth, you referred to those as well.

I think you said that you looked at 16 sites and found very few—a couple maybe, or two or three—with adequate water. I just wonder if you can give us some idea of what sort of volumes you're looking at.

As Dan has said, the technology is there to grow fish in closed containment. Obviously that happens throughout the industry, at least to the smolt stage. If you could do this anywhere, say in an urban area, where the water is either chlorinated or fluoridated, would that be a problem? Do you need groundwater or aquifer water?

• (1630)

**Mr. Clare Backman:** I'd be happy to add a bit more detail there.

When we did the analysis for a site for this pilot project on the east coast of Vancouver Island and were looking from the Oyster River area, just south of Campbell River, all the way to Port Hardy, why did only 2 out of 16 identified areas make the grade?

There are a couple of reasons for that. First of all, I'll piggyback on what Dan said a moment ago about there being no standardization. In talking to the suppliers of the technology, there was quite a variety of water requirements quoted by different groups, ranging from 600 gallons a minute to 1,000 gallons a minute and greater than that. Some required 5,000 gallons a minute. We were also looking at a pilot that could incorporate marine water as well as freshwater. We had to look for locations where there was a likelihood of our being able to access both freshwater and marine water, and in those same kinds of volumes—maybe as high as 5,000 gallons a minute, depending on the specifications of the group we were looking at.

From the information that was available on the aquifers, there was no salt water available near many of them—although there was freshwater. In some of the freshwater locations, there was known to be heavy metal contamination. It was not so much that your human population would suffer, but it was too much for your fish to live in, day in and day out. So these locations dropped off the list. We came down to two locations that appeared to have adequate freshwater volume and quality without these contaminants. We still don't know about the marine water. We'd have to actually do some drilling and pump testing to find out if salt water is available at the levels required.

Hopefully that answers, to some degree, the survey part of your question.

The second part of your question was whether we could pick up water from an urban source. You touched on the major concern, which is that if it's fluoridated or chlorinated for the benefit of people, we can't use it—not without incurring more expenses to remove those additives. As Dan said, we have the technology to do it anywhere. It just depends on what the costs are based on the challenges you're facing at a particular location. To set up in Vancouver, for example, we'd have to put something on the front end, if they're still treating the water, to remove those additives before we could put it into the fish.

**Mr. Randy Kamp:** I have another question. Is there a reason for the greater interest—at least from what I've seen so far—in the use of closed containment to grow Pacific salmon as opposed to Atlantic salmon? I always understood that Atlantic salmon grew faster, so I wouldn't think it had to do with that. Is it price? Is it more likely that closed containment, if it moved forward as part of the industry, would not be for Atlantic salmon but for growing Pacific salmon?

**Mr. Clare Backman:** My understanding right now is that the majority of people who are growing fish in these small facilities are using Pacific salmon. I know that SweetSpring Aquaculture in Puget Sound is growing coho. Swift, I believe, is coho as well.

From my experience, and I've been 25 years in and around this industry, is that you work with what you know. Both of these groups started with these fish some years ago and they've gone through a process of refinement with their brood fish over the years and are continuing to use a species that is adapted to their particular technology, which they trust. They know how it's going to perform.

Sweet Springs is now selling to one of the larger suppliers in Vancouver, and that's brought some exposure to that facility and, I believe, it's bringing some more interest in others who are wanting to experiment and develop the coho as well.

So I think it's more along those lines than not wanting to work with the Atlantic salmon. I know that other groups are still looking at Atlantics to experiment with.

• (1635)

**Mr. Daniel Stechey:** I would just add to that from the perspective of it being a niche market, as we noted.

Coho provides a tremendous opportunity for a niche market. SweetSpring Salmon has done a very good job at developing that market. You can produce a coho salmon up to about three kilos within a year in a closed containment system. If you compare that to a rainbow trout in the same system, you're likely to get maybe one and a half to two kilos at best. And, coho salmon will sell for about \$4 a pound compared to about \$2.25 a pound for a rainbow trout.

As I always say, it's an exercise in mathematics. If you do the math, the coho comes out on top. If you do the math with Atlantic salmon, you need to be very large. The coho works well at a 100 to 200-tonne facility. To break even with salmon, as you've seen from the report, we're talking well over 1,000 tonnes of production just to achieve the economies of scale. With salmon, you're going up against the rest of the world, which is producing 1.3-1.5 million metric tonnes of salmon in low-cost production systems. It's mathematics.

**Mr. Randy Kamp:** Thank you very much.

**The Chair:** Ms. Doré Lefebvre.

[*Translation*]

**Ms. Rosane Doré Lefebvre (Alfred-Pellan, NDP):** Thank you very much, Mr. Chair. Thanks also to the witnesses for being here today.

Mr. Backman, you said at the beginning that cleaning closed containment facilities needs a lot of water. With net pens right in the ocean, you cannot necessarily clean the aquaculture facilities.

I would like to know about the environmental impacts. Ms. Salmon mentioned that there is no significant difference between the two, but if the waste is not cleaned and it goes directly into the ocean, there must be a significant impact.

[*English*]

**Mr. Clare Backman:** Yes. I think the question is regarding the environmental impact comparison, that is, the impacts of net-pen facilities in the ocean compared to recirculating aquaculture systems. It seems that the impacts are more apparent or greater in the net pens, and maybe less in the recirculating systems.

In terms of the specific impacts, there are differences. For example, regarding my earlier comment about the waste from the fish leaving the nets and going to the ocean floor, you don't see that in a recirculating system because that's filtered out. It becomes a very concentrated waste, which must be dealt with. The large volumes of that haven't been explored, so exactly what will happen with that is unknown. However, it won't be dispersed into the environment.

It's important to understand that the release of waste into the ocean from the net pens is not free to the environment right now; it is in fact something that is internalized through the costs that we bear from monitoring and reporting and adhering to regulations. The majority of that is internalized, not externalized. A component may be externalized, but the majority is internalized at this point. Part of the work with the environmental movement in British Columbia is trying to go through each of these components to identify the ones that remain externalized, and then trying to put them into a model for monetization. We're still working through that. It's quite complicated.

I'm going to step away from that to some work that was done for the purpose of the Cohen commission. It's been entered into evidence at the Cohen commission, and it involved an LCA, a life-cycle analysis, approach to a comparison of net-pen and recirculating aquaculture. Again, we were using the information from our pilot proposal, which we have been putting a lot of effort into this year.

It was very interesting to look at that, because, as I was saying a moment ago, there are some localized impacts at a net-pen location that we could discuss. They don't appear to be present at a recirculating hatchery. But there are costs of the capitalization, that is, in terms of the global warming potential of the elements that go into building and running that facility. When an analysis of those costs is done for British Columbia, it turns out that the global warming potential on a life cycle basis of the recirculating aquaculture, if everything goes correctly with the recirculating aquaculture, is similar to but a little worse than the net-pen operations. It doesn't take very much to go wrong in running a recirculating aquaculture facility and thereby make it progressively more costly from a life-cycle analysis perspective, and thus for it have greater global warming potential. That would be the kind of blend of electricity that we would use, if we in British Columbia moved away from hydroelectric and included more purchased power from the United States, for example, or other locations. Then the global warming potential of that energy goes up and the life-cycle analysis changes.

The point I'm trying to make here is that there are the local evaluations, but when you take them all together and you compare them with a life-cycle analysis perspective, net pens are still better—and depending on the particular kind of technology that's used for closed-containment, they can be significantly better.

•(1640)

[Translation]

**Ms. Rosane Doré Lefebvre:** Okay. Thank you.

[English]

**The Chair:** Your time has expired.

Thank you.

Mr. Sopuck.

**Mr. Robert Sopuck (Dauphin—Swan River—Marquette, CPC):** Thank you.

By definition, net-pen open-ocean aquaculture has to be in rural areas, right? So those by definition produce rural jobs primarily. Closed containment aquaculture is much freer to locate where it

would be best located, and I would suspect that's closer to markets. Is it fair to say that mandated closed containment aquaculture would have disproportionately serious impacts on many rural communities?

**Ms. Ruth Salmon:** Absolutely. If that were mandated, the industry, realistically, might not even be able to survive. The industry would look at operations elsewhere if that were mandated. It could have a dramatic effect.

So yes, if we moved to closed containment, it would be in different areas, close to markets and certainly not in the rural coastal communities that we have now. But we also might not have an industry, because it would be physically impossible to move 40,000 metric tonnes of marine harvest production on land.

You're absolutely right.

**Mr. Robert Sopuck:** Right. But again, we're asked to speculate. People talk about technology changing and so on. As decision-makers, we have to look to the future and look at the implications involved.

**Ms. Ruth Salmon:** It would have a pretty dramatic impact on employment.

**Mr. Robert Sopuck:** So there would be a disproportionate rural impact.

Again, if closed containment were mandated, costs would most definitely go up, which is what think you were saying, we would end up with higher prices in our supermarkets. But our competitors wouldn't be in the same regulatory boat and our market would therefore be flooded with inexpensive net-pen salmon from around the world, right? So our closed containment aquaculture industry would suffer greatly, or essentially be destroyed. Is that fair to say?

**Mr. Clare Backman:** As things stand today, if the Canadian industry were mandated to go 100% into this higher-cost form of production of closed containment, then your analysis would be correct. We would have some market, but nothing like what we have now.

The markets that are looking for commodity pricing would choose those offshore products.

•(1645)

**Mr. Robert Sopuck:** And I guess because of free trade agreements we couldn't close our market to those imports?

**Ms. Ruth Salmon:** That's right.

**Mr. Robert Sopuck:** I have another question. I am an avid Atlantic salmon fly fisherman. I love to fish the wild salmon. Will we ever see the day when commercial fishing of wild salmon will cease to exist worldwide because of expanding production of farmed Atlantic salmon, and the fish will instead be reserved for subsistence use and angling purposes? I guess the analogy is that we don't commercially harvest moose and deer. We have enough domestic beef, and so those species are reserved for other things.

Will we see the day when wild Atlantic salmon commercial fishing will be a thing of the past?

**Mr. Clare Backman:** Wild Atlantic salmon commercial fishing doesn't happen in British Columbia, so I can't add too much on that.

**Mr. Robert Sopuck:** I know, but I'm talking about the east coast, obviously. I ask because the fish has such value as an angling species worldwide. Indeed, the Atlantic Salmon Federation had just put out a major report on the value of wild salmon.

Worldwide will see commercial Atlantic salmon fishing become a thing of the past because of increased aquacultural production?

**Mr. Daniel Stechey:** Dating back to my days at DFO when I was participating at NASCO, the North Atlantic Salmon Conservation Organization, it was only Ireland, as I recall, that had a bit of a wild salmon fishery left for Atlantic salmon. Unless I'm mistaken, I think that fishery has been shut down completely.

Do you know of any commercial fisheries for wild Atlantic salmon?

**Mr. Robert Sopuck:** I know that Greenland is trying to reopen theirs. Again, there's a big fight there. The Atlantic Salmon Federation is working very hard there.

To me, the wild salmon is too valuable to commercially harvest. We have the fallback position of all the Atlantic salmon that you folks produce.

**Mr. Daniel Stechey:** Just to come back to the economics and mathematics of this, if I may, the value of that fish in the sport fishery is far greater than it is in the commercial fishery.

**Mr. Robert Sopuck:** Right.

In terms of closed containment aquaculture, you talked about coho as a possible niche market species. What other species could be raised in closed containment? I'm from Manitoba, and I'm interested in aquaculture. Ms. Salmon and I had discussions about inland closed containment aquaculture, or perhaps freshwater lake aquaculture. What are some of the other species?

**Mr. Daniel Stechey:** The next time you're back in your home province, you should go to Warren, Manitoba, and visit the model farm there for trout. It's a closed containment facility.

At the end of the day, I have a lot of clients who say, "I want to grow this species" or "I want to grow that species". I say something along the lines of what I said earlier about technology: There are 47,000 species of fish on this planet and, honestly, in this day and age, we can grow any one of them you want. But at the end of the day, if you want to grow the fish and make money, the list of species gets really short really fast.

**The Chair:** Mr. MacAulay.

**Hon. Lawrence MacAulay:** I am thankful that the species becomes scarce when that happens, because we don't want it all to go to that....

Mrs. Salmon, you said that \$2.2 billion and 4,500 people were involved in the aquaculture industry. Does that involve all aquaculture, including the blue mussel industry in my province?

**Ms. Ruth Salmon:** It does. That's total aquaculture in Canada.

**Hon. Lawrence MacAulay:** On this committee, over the last few years, there has been a topic called sea lice. Some people blamed the open-net farms and their overpopulation for the sea lice. In fact, when the downturn in the return of the salmon took place, it was a

big issue here. Would you like to comment on that and how you handled it?

**Mr. Clare Backman:** You're asking about the actions that the net-pen aquaculture industry have taken to address the concerns about sea lice. Sea lice on farm fish are quite different on the east coast than the west coast. That has been explained to the committee in the past. On the west coast, the sea lice are a different species and far less damaging to the fish. On the east coast, it's a different situation. In both cases, the industry's response has been to adhere to maximum thresholds of allowable sea lice to reduce their ability to create more sea lice on the wild fish that are around the cages. That's done through a program of monitoring and taking steps when there are sea lice approaching or exceeding the maximum threshold. We take steps to control their numbers.

• (1650)

**Hon. Lawrence MacAulay:** Is that tested all the time?

**Mr. Clare Backman:** It's tested throughout the year, all the time.

**Hon. Lawrence MacAulay:** On eco-certification, do you see this becoming easier to handle in close containment or in open-net aquaculture? Would you comment on that? Eco-certification is something that is coming. It's here, and it's not controlled by this government but by the world community. It's an issue that we have to deal with, no matter what fish you are talking about.

**Ms. Ruth Salmon:** It's a growing trend, and I would say the Canadian industry, over the last two to five years, has been more interested in third-party certification and is moving in that direction.

At this time, the number of standards and certification programs is growing. I'm not aware of any certification program for closed containment; it would require different standards. At this time, the standards are focused on net cage technology. That's growing, but we're not there yet.

As for mussels from your province, there are fewer standards and certification programs available for bivalves than for salmon, for example. We're in the process of developing those. You'll see, in the next two years, more and more programs available. At present, there are no standards for closed containment Atlantic salmon.

**Mr. Clare Backman:** There are certification standards available right now for salmon aquaculture in the ocean or hatcheries. A lot of emphasis has been put on a couple of programs, including the WWF-sponsored program, the AFC, and the GAA best aquaculture practices certification program. These are attracting a lot of attention because they have moved more into the eco-certification zone. They worked with environmental groups directly.

At the beginning of these programs—and I would say here that I was involved with our company in the WWF program since its inception—there was never a focus on any one kind of technology. The idea was to identify standards that the whole industry could adopt in order to move it toward greater sustainability and less environmental impact, regardless of whether net pen or recirculation systems were being used, or whatever. It never focused on any one particular kind.

**Hon. Lawrence MacAulay:** But look at the quality of the fish.

**The Chair:** You're out of time again.

**Hon. Lawrence MacAulay:** I want to talk about the chickens... and the quality.

**Voices:** Oh, oh!

**The Chair:** I'm sure.

Mr. Donnelly.

**Mr. Fin Donnelly:** Thank you, Mr. Chair.

It seems to me that if you look at every jurisdiction around the world, you'll see that wherever there has been a fish farm, there have been environmental problems. They're now coming to the west coast of Canada. Look at the Scandinavian countries, look at South America. There have been these associated problems. Whether it's parasites or disease, there have been issues. It seems that something needs to change.

Dan, you mentioned that to grow fish and make money is pretty much the issue. I would add that your comment makes sense when you externalize the environment.

Another trend is that we're starting to look at life-cycle analysis and doing full cost accounting. We're actually starting to look at including the environment in our analysis, because what was essentially being done for free, or not as part of the balance sheet, is now becoming a concern to people around the world. It certainly is in the area that I come from on the west coast.

Clare, you mentioned the pilot project that Marine Harvest is working on. I'm wondering if you could give us an update as to where that project is at. You mentioned specifically that you've been a little more active in the last year. Is there something you could provide on how that's progressing, where it's at, and any news on that front?

• (1655)

**Mr. Clare Backman:** The intention of the pilot project, which I referred to a couple of times, including the siting and engineering reviews, is twofold.

First of all, it is to identify the real costs of doing Atlantic salmon in British Columbia on a commercial scale. Right now we don't have demonstration projects on a commercial scale that can actually bring that information forward. We have debates about technology and about what the costs and energy requirements might be.

The second important aspect of the project is to investigate the size of the fish that we deliver into the ocean beyond the 100 gram smolt level, that is, to investigate 300 gram, 500 gram, and one kilogram fish delivered into the net pens. These things also haven't been explored, so it's a combination of those two.

Where is it at? To analyze the program at a 2,500 tonne commercial level, the information from the 300 tonne pilot project will be extrapolated to that the 2,500 tonne level. The 300 tonne facility is going to cost us in the neighbourhood of \$8 million to build in British Columbia. We are currently at a place where we're trying to attract and find the funds to move forward on that. We haven't yet identified the funds. Internal funding is not forthcoming at this point in time. With the current situation for salmon in North America, we're going into a bit of a decreased price scenario, so we

don't have the ability to move forward, which we would have had a few years ago when the pricing of salmon was strong.

To answer your question, we're at a point where we've made some decisions on technology, and have a site and are moving forward on getting the site work completed, but we don't have a firm date for beginning the pilot itself.

**Ms. Ruth Salmon:** Could I make a comment on your initial comment about disease and parasites?

**Mr. Fin Donnelly:** Sorry, I have a quick follow-up question before we go there, because I have limited time.

Could you comment, Clare, on why you took on this pilot project?

Then if there's time, Ruth....

**Mr. Clare Backman:** Well, I go back to the first part of my comments where I said that the reasons were to introduce actual operating information and costs—actual energy costs, actual capital costs, actual market receptivity information—into this debate in British Columbia, which is quite a large debate about where closed-system aquaculture fits.

Now that's half of it. The other half of it, as I say, was to explore the benefits of providing larger fish to move into the ocean environment for our existing facilities. Think about it: We're growing 40,000 tonnes of salmon a year in net pens. We're building a pilot to provide information on 300 tonnes of production, which can be extrapolated to 2,500 tonnes. Everything we currently look at says it's going to cost more than being in the net pens, but we're committed to finding ways to move forward and understanding this discussion in a greater sense.

So how can we do something that blends finding out more about the full harvest size and aids our growing business in the ocean as well? That's basically the answer for you there.

• (1700)

**The Chair:** Ms. Salmon, do you have a comment?

**Ms. Ruth Salmon:** I just want to comment quickly. You mentioned disease and parasites. I think it's important to put aquaculture in a bigger context as well, because any other food-producing system has challenges with regard to disease and parasites.

Ninety-eight percent of all the fish that are harvested through aquaculture receive no antibiotics. So our ability to deal with fish health through vaccinations has improved greatly. Parasites are a problem for terrestrial agriculture, which has been around longer. It has more access to therapeutants. We're just building our toolbox, and we'll be in a better situation in a few years to have more treatments available.

So I'm just putting it in the context that aquaculture is farming and we struggle with the same challenges as other farmers.

**The Chair:** Thank you.

**Mr. Daniel Stechey:** Could I just add very quickly that I hope we have a chance to come back to your comment about externalities at some point during this discussion? Thank you.

**The Chair:** Okay, if get a chance.

Mr. Hayes.

**Mr. Bryan Hayes (Sault Ste. Marie, CPC):** Thank you, Mr. Chair.

With this next question, I hope to prove to Mr. Cleary that no question is a dumb question. Your question was excellent, by the way.

I just want to speak a little bit more about something that Mr. Sopuck started on. I need to quantify the demand a little bit more. You talked about a percentage increase, and my accounting mind is telling me that there is this thing called supply and demand and that at some point the market is going to be saturated. I would think this is ultimately going to drive down the price of salmon and make aquaculture unfeasible.

Has anybody looked at the demand? Is there an infinite demand, or at some point.... Have any break-even analyses been done? I'd just like to get a better understanding of that.

**Mr. Clare Backman:** In a general sense, our business is about raising salmon for the population of North America, and everybody tells us that the population of North America is growing. Therefore, if our percentage of consumption is maintained per capita on a growing population, you will get increased demand. So that's the understanding we come back to when we say that our market is growing at 3% to 5% a year and, therefore, that our ability to produce salmon needs to grow at 3% to 5% a year.

Along the way of that straight line, there are ups and downs, based on what you mentioned, that is, supply and demand. So when supply is short, then people will pay more for a product, and when supply is great, they will pay less for a product. And that's what we're going through right now. We will have increased supply for the next few months, maybe a year or so; but over the long term, based on population growth, we expect that demand will continue to grow by 3% to 5%.

Dan, do you have anything to add?

**Mr. Daniel Stechey:** In a nutshell, if you look at documents from the United Nations Food and Agriculture Organization, they're full of information about the global shortage of fish. We're not even close to being able to fulfill the demand. If we doubled the size of the aquaculture industry today, we'd be lucky to fill the demand. It's almost an impossible target to reach.

**Mr. Bryan Hayes:** Here's my second question, and this goes back to this pilot proposal.

Clare, you mentioned the costs involved. I'm trying to get an understanding of how these are being funded to this point in time and what you see as the role of the federal government in this particular initiative.

**Mr. Clare Backman:** Well, we did make application for federal funding through a couple of programs, the AIMAP of the Department of Fisheries and Oceans for aquaculture innovation, and we made application through Science Development Technology Canada, SDTC. Both of those groups were supportive, and we were progressing those applications forward. But those were not even half of what the required budget is for the pilot program, at roughly \$8 million. We're at the point right now of identifying that larger piece

of money, more than half of that, in order to be able to go back to those agencies.

In a general sense, as has mentioned, I think at this point in time the federal government should be supportive of these programs that are going to allow us to come to terms with the real costs and benefits of these newer technologies, so we can get past the discussion about whether it's all or nothing and find out exactly where it fits into the marketplace and the overall plan for salmon going forward.

• (1705)

**Mr. Bryan Hayes:** At this point, would you say that funding is the most significant obstacle to the development and implementation of closed containment salmon aquaculture on a larger scale? Is that the number one impediment right now in your mind?

**Mr. Clare Backman:** Yes.

**The Chair:** Thank you, Mr. Hayes.

Ms. Davidson.

**Mrs. Patricia Davidson (Sarnia—Lambton, CPC):** Thank you very much, Mr. Chair.

Thanks very much to our presenters for being here this afternoon.

I have a wrap-up question to ask. We've heard a lot of different things here this afternoon. We've heard about the several small projects that are under way. We've heard about possible studies for the viability of commercial-scale production of closed containment. We've talked about 2 of the 16 sites that showed they had a suitable water supply. We've talked about waste control, albeit not much despite it probably playing a big part in closed containment when you're talking with communities and so on. There's also been talk about there being no standardization in the industry or sector.

I think that those all play a big part, but is there anything currently that is a more significant obstacle to the development and implementation of the larger-scale aquaculture projects? Secondly, are there any regulatory changes that would make closed containment more viable?

**Mr. Clare Backman:** To answer the first part of your question on any impediments to the development of the larger examples, I'm thinking that by this you mean the current net-pen facilities and their growth on both coasts. The impediments are largely regulatory at this point in time. We're waiting in British Columbia to be able to submit new applications for locations that are considered to be appropriate and sustainable, with plans to demonstrate that these intended facilities would be sustainable in those locations.

Also, we've covered fairly well here today the type of activity that is of interest in the closed systems, which are less consistent in terms of their designs. The ones I mentioned early on would probably each be working with a different firm and a different technology supplier, so there would be variations from one to the other.

I didn't mention the amount of technology and effort that go into cleaning the water, but I will say that if you have tanks of fish on one side of the building in a recirculating aquaculture facility, then you have a wall, and on the other side you have the water treatment, which is equally as large and would look like a water treatment facility of a municipality, for example. A lot of energy goes into taking out the solids, into taking out the CO<sub>2</sub> and the nitrogen, and reinstituting the oxygen, and cleaning the water so that it can be put back in again. This part of the water treatment is where very much of the debate occurs around the specific type of technology that you're going to choose.

**Mr. Daniel Stechey:** I'd just like to make it really clear that in my opinion—and there are many examples of this—closed containment is economically viable today. We have coho farms that are producing coho and selling into a niche market. We've got tilapia farms that have been growing fish in closed containment systems and selling to live markets in Vancouver, Toronto, Montreal, and New York City for 15 to 20 years already. These are closed containment systems. They work.

The thing that sets them apart is that they're producing a premium-priced product, so you can afford the technology that Clare just explained. When you go to a commodity product like Atlantic salmon and you're competing with producers around the world who are using a lower-cost technology to produce it, that is, net pens, then you're going to have a hard time competing unless you become extremely large scale with very high capital costs.

• (1710)

**Mrs. Patricia Davidson:** Thank you.

**The Chair:** Thank you very much. This concludes our time for questions today.

Do you have any closing comments before we end our session with you today?

Mr. Stechey.

**Mr. Daniel Stechey:** Thank you very much again for the opportunity to be here today. I think it's a valuable exercise that you're going through.

I'd just like to come back to the comment that was made about externalities, for a moment if I may. I think it's a valid comment. Clearly, externalities are an economic principle that need to be factored in here, but I think they need to be factored in within the proper context and that you need to look at them from both sides of the equation.

Ruth mentioned the Canadian Environmental Assessment Act, a tool that is widely applied. It applies to virtually every aquaculture

project in this country by virtue of their needing a federal approval to go forward. Therefore, a comprehensive review is done at an early planning stage to assess all of the risks and to mitigate those risks and to put the proper measures in place before any initiative can go ahead. All of the externalities that are talked about are mentioned there.

On the other side of the equation, though, I would encourage you to look at the societal costs, because, ultimately, when you look at the definition of an externality, it's a cost that's borne by society for an exclusive benefit some place else. So the question is, what is the societal cost of salmon farming, and that really needs to be addressed, because when we're applying this properly and going by all of the measures, this is a sustainable industry, as Ruth said. I would echo her comment very strongly. I don't think there are many better examples of a sustainable agriculture sector than salmon farming, just owing to the food conversion and the way the industry is operated. Can it be better? Absolutely, there's no question. This industry gets better year by year by year. Technologies evolve and develop and we improve. That's what it's all about.

On the other side of it, though, I want to bring up the precautionary approach because it hasn't been mentioned at the meeting today. It may have been brought up elsewhere. It's a principle that's widely thrown out there on the table. This measure says, in the face of uncertainty, exercise precaution. When you have a whack of scientific certainty, do nothing. That's the way it's applied. But I would really question you and ask, what's the societal cost of doing nothing?

Underscoring both SIA and the precautionary approach are the notions of serious and irreversible harm. I would really argue that in salmon aquaculture, when there's a problem, we retract. In the worst case scenario, you pull the farm and there is no serious, long-term damage from that operation. So you have reversibility, which gives you the leeway to go ahead and use adaptive management and to try to improve as you go forward. We really don't exercise that in this industry anywhere near the extent it should be. Society is paying a cost for that because we are losing economic development opportunities on that front.

I would just encourage the committee to look at it from that side as well. We can move forward, we can improve, but let's work cooperatively. Let's all roll up our sleeves and come to the table and say, we're going to make this industry succeed.

Thank you very much.

**The Chair:** Thank you very much.

As there is no further business, the meeting is adjourned.









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