House of Commons
CANADA

Standing Committee on Fisheries and Oceans

FOPO • NUMBER 008 • 3rd SESSION • 40th PARLIAMENT

EVIDENCE

Wednesday, April 14, 2010

Chair

Mr. Rodney Weston

Standing Committee on Fisheries and Oceans

Wednesday, April 14, 2010

● (1535)

[*English*]

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

Before we begin with our guest this afternoon, we have a housekeeping item to deal with. In your packages you will find a couple of budgets required to cover witnesses' expenses. There are two budgets, one for $7,700 and the other for $5,700.

Is it the pleasure of the committee to adopt proposed budget one, in the amount of $7,700?

(Motion agreed to)

The Chair: Likewise, is it the pleasure of the committee to adopt the second budget, in the amount of $5,700, for expenses pertaining to the video conference and briefings that we have received and will receive?

(Motion agreed to)

The Chair: Thank you very much for your cooperation on those housekeeping items.

Dr. Sheppard is with us today.

We thank you very much for taking the time out of your schedule, Dr. Sheppard, to come and appear before the committee and provide us with a briefing, an update, in your capacity.

We generally allow about 10 minutes for our witnesses to make an opening presentation and then we move into questions from our committee members. The members are aware of the time frames allotted, and these are for questions and answers.

At this time, Dr. Sheppard, I would ask you if you have any opening comments.

Dr. Mark Sheppard (Veterinarian, Aquatic Animal Health, Ministry of Agriculture and Lands, Government of British Columbia): Thank you very much.

First I'd like to thank you very much for the invitation and the opportunity to come to speak with you in person and address any questions the committee has about the management of fish health in British Columbia. I trust the committee has received a small package or brief, including some graphs, that I anticipated might cover the usual topics of interest in B.C. aquaculture. I'm happy to speak to those notes if they require further clarification.

To begin, I should introduce my credentials and experience. I have a bachelor of science degree. Subsequent to that, I earned a doctorate of veterinary medicine from the Canadian Western College of Veterinary Medicine. I have 20 years of veterinary experience in finfish aquaculture management, both in Canada and abroad. I have provided veterinary services as an animal health consultant to aquaculture farms and the federal fish enhancement facilities.

I joined the province just three years ago and currently manage the operations of the British Columbia provincial fish health program within the animal health branch of the B.C. Ministry of Agriculture and Lands. I provide advice on the management and health and diseases of economic and regulatory significance to the aquaculture sector and to senior ministry executive for strategic planning. I interact regularly with federal and provincial agencies, industry, first nations, and the public.

Now that I've told you what I am, I should probably balance that by telling you what I am not. I am not a policy-maker, I am not a sea lice researcher, and I am not a wild fisheries biologist, so please understand that I will do my best to answer your questions, but I may restrict my comments to aquaculture and my area of expertise, hopefully using sound and scientific objectivity, rather than delving into the world of speculation and innuendo, which is often what we are exposed to in the media and the Internet lately.

I would like to introduce ten or so key points at the outset, if I may.

British Columbia's salmon aquaculture industry is monitored through very frequent inspections by the Ministry of Agriculture and Lands and the Ministry of Environment. My staff alone audits and monitors the industry farms approximately 150 times each year. In other words, the fish health staff are on the salmon farms, on average, more than 12 times per month.

When considering infectious agents or disease agents on those salmon farms, on average the survival of the farmed salmon exceeds 97%. Any other losses beyond that are due to environmental and predation issues, so overall the farmed fish are very healthy populations.

As a measure of accountability and transparency, the industry-specific results are regularly made public online and are included in the annual fish health and compliance inspection reports. Farms' sea lice values are posted either by the farms directly onto the web or on a monthly basis through the provincial government website.

Contrary to what you hear or see in the media, sea lice in British Columbia are not a growing problem. The management of lice in British Columbia is very much under control. In general, lice abundance on both farmed and wild fry has actually declined for five consecutive years.

The province takes this issue and the public's concern very seriously and follows a comprehensive sea lice management strategy. That strategy is part of the larger fish health program, which takes a proactive approach to fish health management at the farms.

● (1540)

Speaking directly to the issue of sea lice in British Columbia, I'll make a few points.

Lice abundance on farmed salmon in British Columbia is low compared with lice abundance experienced in other countries and regions. We're talking ones and tens of lice per fish as opposed up to hundreds of lice per fish in other regions.

Some research from 2007 and 2008 that I consider to be cornerstone genetic research shows that the Pacific Ocean louse is genetically different from the Atlantic Ocean louse, the problem in Europe and in eastern Canada. This largely explains why in British Columbia we have not seen the lice-related damage that the other aquaculture regions experience.

That genetic difference, by the way, between the Pacific Ocean louse and the Atlantic Ocean louse is basically equivalent to comparing a human to a chimpanzee, and largely explains why we do not see the lesions and the disease problems.

Sea lice, as you know, are naturally occurring parasites, as common as fleas on a dog. We are not going to get rid of them from our ecosystem. The changes and the ups and downs in lice abundance patterns are common, and are readily explained by environmental and farming events. Fresh and new populations of lice come to B.C. from wild fish as they return to the B.C. coastline at the end of each summer. There is insufficient evidence to substantiate the claim that lice in British Columbia are resistant to the one drug we use.

In closing—I'm sure you have many questions—British Columbians want the risk to wild fish minimized, and so does the provincial government. That is why the animal health branch has monitored and analyzed routinely, and reported the status of lice and disease on B.C. salmon farms, for the past seven or eight years. From that, we can claim that the ecosystem as it relates to salmon aquaculture remains healthy and sustainable.

Mr. Weston, that ends what I would like to present today. I would be very happy to entertain questions.

● (1545)

The Chair: Thank you very much, Dr. Sheppard.

Mr. Andrews.

Mr. Scott Andrews (Avalon, Lib.): Thank you, Mr. Chair.

Just to start out, I'd like to go back to one of the first points you made, and maybe get you to provide a little bit more detail to the committee, regarding the access you had to the aquaculture farms. You made the statement that you were there 12 times per month.

Have you had access to all the aquaculture farms? As well, what kind of access have you been given in order to do some of your research?

Dr. Mark Sheppard: Thank you. That's a very good question.

The fish health program is largely based on a database system that has an algorithm. At the beginning of each quarter of the year, we put in the farms that are currently active with growing fish in that quarter. The computer will randomly choose which sites we are going to go audit and visit, not only for health visits but also for sea lice monitoring and audits.

Our staff, once that's chosen, will communicate with each of the farms, and over the next three-month period will go and visit those particular sites. They will coordinate it with the carcass collection days, whether that be coordinating with a third-party diving company, or sometimes the carcasses are brought up by a pump.

So we go out and we attend the carcass collections, collect the samples from the selected group of dead fish, and bring them back, where they are analyzed very thoroughly in the laboratory in the Animal Health Centre in Abbotsford.

Mr. Scott Andrews: Are the aquaculture farms giving you full cooperation and full access to all aspects of the farm? Is there a need to improve that, or is it sufficient?

Dr. Mark Sheppard: We have absolutely full access to the information once we arrive on site. As I said, each farming company has a fish health management plan where they have to meet certain requirements in terms of monitoring their carcasses, monitoring their fish, everything to do with husbandry. They have to record all that. We do have access to all of that information on site.

If I can break this down for you, Mr. Andrews, the fish health program is composed of three basic components. One is the fish health management plan that the farmers must follow and must abide by, which does speak mostly to monitoring, recording, and reporting their own information, and making that available to government officials.

The second component is what I was talking about earlier, which is the fish health audit and surveillance program, where we will coordinate our visits to go and actually collect dead fish of diagnostic quality and have those submitted and screened for pathogens of concern to Canada and internationally, not to mention the endemic infectious agents that are just in the ocean in B.C.

The third component is to coordinate visits to actually go and conduct sea lice counts at the farm, shoulder to shoulder with the farmer. By that I mean they will count half of the fish and we will count the other half of the fish that are collected. In other words, they count 30, we count 30, 10 from each pen, so that we can make a comparison and feel confident that what they're looking at and what they're reporting is the same thing that we're seeing and what we record.

● (1550)

Mr. Scott Andrews: Do you agree with the statement that's made that aquaculture has been one of the possible causes of the decline in sockeye salmon?

Dr. Mark Sheppard: As I said, to reiterate, I'm not a fisheries biologist. I would suggest that question might be better answered by a DFO scientist.

However, not to dismiss the question, I'll say that from an aquaculture perspective, as I said, with the infectious rate in farmed salmon and the survivor rate being over 97%, I do not foresee that the aquaculture industry has an effect on the Fraser River sockeye.

Mr. Scott Andrews: Speaking about scientists, do you think government agencies have enough scientists? Are we doing enough science in this matter? Could we do more? Is it at the suffice level now, or should we look at possibly expanding it or suggesting it be expanded?

Dr. Mark Sheppard: Personally, I feel the industry is very highly monitored, not only by the provincial government and the Ministry of Environment but also within the industry itself. They have their own veterinarians. They have a much more detailed database than the province does. The veterinarians working in that industry see things on a daily basis. They have their fingers on the pulse.

Of course, there has been a tremendous number of questions and improvements over the last 25 years, and a lot of that has been due to ongoing projects and questions, and then supporting that through applicable research. An awful lot is being done already. Of course, the focus lately has been on sea lice activity and trying to find the answers to that. But we feel we've got a fairly good finger on the pulse in terms of what's happening health-wise at the farms.

Mr. Scott Andrews: I have a question here that one of our analysts put together. We heard evidence that tolerance to Slice, an antiparasitic drug used to treat sea lice infection, was not a problem in British Columbia. Can you confirm that this is the case, and how do you test for this type of drug tolerance? Are you familiar with that?

Dr. Mark Sheppard: Yes, and again, I'll reiterate that there is no evidence to substantiate the allegation that there is drug resistance to Slice by lice in British Columbia. To make such a claim, in my opinion, is misleading and quite frankly irresponsible.

It's a complex issue, drug resistance and the development of it, and there are a myriad of other factors that need to be considered before putting it on the list. Now, it is on the list; it would be on the very bottom of the list as a likelihood as to how one would explain why a Slice treatment did not work.

If people are interested in that line of questioning, perhaps I should start at the beginning and explain what is really happening as opposed to the allegations that are out there. Is that acceptable?

Mr. Scott Andrews: Go ahead.

Dr. Mark Sheppard: Maybe I should begin with a normal Slice treatment in British Columbia.

Again, British Columbia is in a very unique situation. The lice are very much under control. Slice is only used approximately one time each year. So its infrequent use, first of all, is not conducive to the development of resistance. It's a very effective drug normally.

What happens is that new batches of naive lice come back on the wild salmon, and they seem to be readily transferred into the farming system, usually beginning sometime in August or September. Normally at the farm site a veterinarian will continue to monitor that situation, and will finally write a prescription to medicate that population of farm fish—sometimes in November, sometimes December, sometimes January. In the winter months, that's when the lice numbers have accumulated, compared to the rest of the year.

Within a month or so after that treatment, the lice numbers normally drop to next to nothing. Without any further challenge of lice...which is the normal case in British Columbia, because as I said, the resident availability of lice usually doesn't begin again until September. So after that Slice treatment, the farmers in British Columbia normally have the opportunity to have effectively a louse-free or very low louse count, often below one per fish, for anywhere from three to six months, until again they're challenged with lice when the next batch of Pacific salmon comes through in late August or in September.

If I can take you back to June 2009, a different scenario was set up in one particular area of British Columbia. It was a very dry year with very little rain. In June, July, August, what happens on the west coast, the outside coast of Vancouver Island, is that the farms often suffer from what's called a “low-dissolved” oxygen....

Is that phone for me?

● (1555)

The Chair: Carry on.

Dr. Mark Sheppard: Carry on? Okay.

So it's a low-dissolved oxygen situation. Again, it's a natural situation that happens every year. It's my understanding that in the Pacific northwest there is a low-oxygen dead zone, if you will, of dead water, which comes to shore sometimes. So in that period of time, fish can be killed or...but certainly they can't be fed very well, because that will kill them.

In addition to that, when you have a lot of sun and sometimes a little bit of rain, harmful algae blooms will develop. Again, that can either kill your fish, or, as they certainly can't be fed, the farmers leave them down in the bottom; they don't want to entice them up to the top. In that period of time of June, July, August, September, some farms literally cannot feed their fish very much. Instead of feeding them the normal 30 or 31 times a month, they may only get 7, 10, or 15 days of feeding in.

So those are some of the environmental factors. What's happened now is that you have a group of animals who haven't really had access to feed very much and as a result they haven't grown. That would explain why we have undersized fish now, and it can wreak havoc with someone's harvesting and marketing schedules. That was the case here, where you had a group of fish that had just been sort of maintained for several months.

In addition, if you start looking at population dynamics, a pecking order will develop, just as it will among a group of chickens, for example. You will have aggressive fish that will get the feed, and they'll grow a little bit, but because there's a bimodal population, you will also have another group of fish that just isn't doing well. These fish go by a number of different names—poor doers, slinks, or just basically subordinate fish that are marginalized in the population in every pen.

So by the end of October, hasn't been raining, so the salinity of the ocean will have been increasing. The salt content, as far as I can tell, was at a record high in that area. Lice really like high salt content. So you have waves of Pacific salmon coming in with their lice; you have fish that aren't feeding; you have perfect salinity conditions; and you have lice getting into the farms and multiplying there. By the end of October, it looked like the fish were going to start feeding again. So the veterinarian—and I applaud him for his very diligent activity and judicial use of the product—set up a seven-day medication period for the fish. The medication was fed for seven days at the end of October. Cameras were used, as they are in every pen, to make sure that little or no medication fell through. Sure enough, the entire amount of medication, 100%, was consumed by the fish that were eating, and that's the key. Again, you can imagine that you have a prescription of Slice eaten by 80%, for argument's sake, of the fish, and that Slice worked very well to reduce the numbers of lice to next to nothing on those robust fish that had access to the feed. You also have another 20% of the fish that were marginalized and didn't have access to that medicated feed. The lice would remain on those fish not exposed to Slice.

So what happened was that shortly after the Slice medication was given, the concentration of that product in the mucous and the skin started to decline over a number of weeks. As it declined, you can imagine that the lice from the subordinate fish were now looking to move back over onto the robust fish. The same thing happens with the lice from the ecology, the other waves of Pacific salmon coming through that area, or with the resident lice on small fish, like sticklebacks, for example. So there are a number of sources of Slice-free lice that are now moving back onto those fish that had been medicated in the last month or two.

That's where you see an increase. You have likely seen some of the graphs. There was an increase in lice, and instead of seeing a nice flat line after that, you see an increase again. That would be the explanation for that: they are not Slice-resistant. Credible and objective scientists have looked at all of these factors.

● (1600)

We went out to visit the site. I went out personally at the end of January to assess the situation and the farm was following all of its requirements, exceeding all of their requirements. I applaud the veterinarian for doing what he did, because at that point there was tremendous pressure to keep throwing drugs at those fish in order to control that situation. But they realized that it's just not going to work when we only have one in-feed product. How can one in-feed product be effective when you have animals that aren't eating it?

That's why the decision was made, the multi-million dollar decision was made, to start to harvest undersized, under-marketed fish to get them out of the system. Quite frankly, it's sort of what everybody would like to have done, but it certainly didn't come across as being praised.

The Chair: Thank you very much, Dr. Sheppard.

Monsieur Lévesque.

[*Translation*]

Mr. Yvon Lévesque (Abitibi—Baie-James—Nunavik—Eeyou, BQ): Good afternoon, Mr. Sheppard. Until now, I was under the impression, further to the testimony presented to this committee, that the lice came from farmed fish. You are saying that the lice can in fact be traced back to Pacific fish. Did I also understand you to say that the lice problem is less prevalent among Pacific fish than among Atlantic fish?

[*English*]

Dr. Mark Sheppard: Thank you for your question. I apologize, I do not speak French well enough to answer in French, but may I repeat your question in English to confirm that I have the gist of it?

Yes, I've given you an opposing opinion about where the lice come from. Others have said the lice come from the farmed fish. I'm saying the lice come from the wild fish.

The last part of the question is that you said I said fewer lice were on the Pacific fish compared to the Atlantic fish, the farmed fish. Is that your question?

So that's true. If we backtrack, we know that the lice do come from the wild. The Atlantic salmon that are grown in the cages come from the hatcheries, and they're completely lice-free. They do not start to acquire lice until they get into the marine cages. Small Atlantic salmon can acquire lice, but they generally have many fewer lice than the larger fish. As they get older, they start to accumulate things in the next season. So the lice do come from the wild fish.

In the package that I delivered earlier, you will notice that there's a typical pattern of where lice increase in the farm cages at the same time that the Pacific salmon are coming back. I think it's well understood that those lice are coming from the Pacific salmon that are returning to the coastline.

In terms of there being fewer lice on the Pacific fish than the Atlantic fish, no, I said that in the last five years, in measuring both the farmed fish—in the out-migration period of the small Pacific fry from March until June—there was a decline in both populations, the farmed fish as well as the presence of lice on the wild fry in that same period for the last five years.

Does that answer your question?

● (1605)

[*Translation*]

Mr. Yvon Lévesque: I have a clearer understanding of the issue.

You referred to the documents that you delivered earlier, but I do not know if they has been circulated. Mr. Chair, I have not seen the charts to which Mr. Sheppard is referring.

[*English*]

The Chair: The documents were distributed. The charts were not, because they were not translated.

[*Translation*]

Mr. Yvon Lévesque: That explains why.

[*English*]

Dr. Mark Sheppard: My apologies for that. I can make some of these charts available. I can leave them with you, if members are interested to look at them. They're largely just bar charts and line charts that do show the history of louse counts at the farms. There are no wild fish on them. These are farm counts from the farmers themselves versus what we audit at the farms. There's a number of reports on lice from the DFO scientists who have been monitoring the wild fry for those same periods; for five years, I guess, since 2005 likely.

[*Translation*]

Mr. Yvon Lévesque: Mr. Sheppard, we know Judge Hinkson decided that aquaculture, often called fish farming, was basically a fishery, not fish farming. Where you surprised by this decision?

[*English*]

Dr. Mark Sheppard: Again to reiterate your question, was it surprising to me that the farmed fish are now referred to by Justice Hinkson as being a fishery? I think his decision was a bit surprising to most people. My understanding is that some questions still circulate around the wild fishery versus the aquaculture fishery and what happens when these fish are inside the cages and who owns them. We certainly know who is going to manage them.

I'm not quite sure what else to comment. Being from a veterinarian background and being from the Province of British Columbia and the animal health branch, where most of the farm animals we monitor are actually farm animals—farm chickens, farm pigs—it just seemed natural that these should be treated just like the chickens, in that they are farmed fish and managed from egg to harvest.

[*Translation*]

Mr. Yvon Lévesque: Further to the affidavit filed by the federal government, the provincial government decided to transfer or cede its current responsibilities to the federal government.

Did the province have any other choice but to cede management of aquaculture to the federal government?

[*English*]

Dr. Mark Sheppard: Right. I understand the question, thank you, the question being could the provincial government have made a different choice as to what was finally taken and retain the right to manage aquaculture in British Columbia. It's a very good question. I've had the same question.

I'm afraid I'm not qualified to answer that question. As I said, I'm not a policy-maker. I'm a manager. Those decisions are certainly made at the political level. I'm just following what will happen in the future, and we're all waiting to see what the Department of Fisheries and Oceans will present to us. I'm trusting that it will carry on being managed very well by Fisheries and Oceans Canada.

● (1610)

The Chair: Thank you very much.

Mr. Donnelly.

Mr. Fin Donnelly (New Westminster—Coquitlam, NDP): Thank you, Mr. Chair.

In reference to the graphs, I would be very interested in getting copies of those.

Dr. Sheppard, thank you for being in front of the committee and providing your comments.

One of the handouts, in the background information, says this with regard to Slice:

> From a strictly medical perspective, the drug protects the fish from lice for a short period. If medicated fish are exposed to unmedicated lice a second time (from various marine sources), those lice may re-infest the recently medicated fish. This situation, as it recently occurred in the Nootka area, is not evidence of drug resistance even though some may interpret it that way.

I have a couple of questions on that. One, I'm wondering if you could describe what drug resistance looks like. This is not drug resistance, in your opinion. What does drug resistance look like?

Second, why are some saying that this is, in their opinion, evidence of a case of resistance to Slice?

Dr. Mark Sheppard: Right. Both are good questions.

If I may, I will answer the second question first. The development of drug resistance is an extremely complex phenomenon. Some people—who are not qualified to make comments on it, in my opinion—have decided to put forth a wildly speculative conclusion based on a graph, which, as I think I've explained to you, had many other factors that needed to be considered before any conclusion was made on that point.

That case in itself is a matter of someone who either didn't understand the science or simply preferred to move forth with a perspective to suit their agenda.

As to drug resistance and what it looks like, if you'd like I can refer to antibiotic resistance in bacteria. Or is your question, Mr. Donnelly, specifically about lice?

Mr. Fin Donnelly: It's about Slice.

Dr. Mark Sheppard: Okay; so Slice and lice.

By the way, for those who don't know, Slice is the trade name for a drug. Its generic name is emamectin benzoate. It's used in different countries and it's very effective at killing all life stages of lice when it works.

In other countries it's used multiple times each year. They use it every six weeks sometimes, for example. In B.C., as I said, we use it once a year normally.

Drug resistance can develop if there is a repetitive use of the product numerous times over short periods. If the drug is not effective at killing all the lice or all the bacteria, the animals that survive—the lice or the bacteria—then have the opportunity to pass on their genetic protection, resistance, of the drug to the offspring. So when the drug is used again, there's more protection. More animals survive and they keep passing on that genetics. It takes quite some time before drug resistance develops in a population of parasites or bacteria. Unfortunately, that is what we're seeing, failed treatments in other parts of the world where they are using Slice on numerous occasions.

Unfortunately, the lice...and again, we're talking here about the Atlantic Ocean louse, a very different animal from what we have here in British Columbia. That's what they're seeing, and as a result, they have to use alternate products to try to control their lice infestations on their fish.

Does that answer your question?

● (1615)

Mr. Fin Donnelly: I think so.

Dr. Mark Sheppard: Well, if I may, if it didn't answer your question, I can see how, for someone without the depth of knowledge to look at a graph to see that there's a peak, there's a medication, then there's another peak, then yes, I suppose if we had drug resistance, that might be what it looked like. But I would still go through the other 20 factors first before making that conclusion.

The Chair: Thank you.

Mr. Kamp.

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

Thank you for coming, Mr. Sheppard.

I think it's fair to say that most of us here are not scientists, and you have done a good job of explaining some of these issues to us in a way we can understand.

After December this year, when there's a changeover of management to the federal government, what do you expect your role or your department's role to be? Do you know that yet? Let me start there.

Dr. Mark Sheppard: Thank you very much, Mr. Kamp.

Your questions are my questions. I trust that Fisheries and Oceans Canada very much appreciates the current activity in terms of audit and surveillance of the fish industry right now. Verbally they've said that they'd like to continue it. I know that the environmental non-governmental organizations, the ENGOs, are quite appreciative of the fact that we're keeping a finger on its pulse, and they feel confident that we're watching for the things we need to be watching for.

The provincial government surely is happy with the situation. Our program has been touted as exceeding international standards. I know that the Canadian Food Inspection Agency is suggesting that it would be nice for all other agribusinesses to follow suit. Again, it's unfortunate that you didn't get the graphs. We can measure the amount of chemicals used in fish right down to grams per metric tonne of animal produced.

I think DFO wants to continue this. I think they feel the need to continue this, but I don't know how it will look. I'm looking forward to seeing their new regulations. I think they will tighten up some of the regulatory requirements for fish health. Right now, the fish health plans are tagged to a term and condition of licence, whereas I have a feeling that the federal regulations may firm that up and turn it into a regulation. I'm not quite sure whether I'll be involved or if my team will be involved or where it will be, but there will be some semblance of it.

Mr. Randy Kamp: It's clear to you that fish health management will, after December, become a responsibility of the federal government. That's not something that's being negotiated as part of any sort of agreement with the provincial government at this point, as far as you know. In some way, the federal government will have to discharge that responsibility.

Dr. Mark Sheppard: Yes, I feel confident that it will continue. I do not know whether it will be a federal responsibility or a provincial responsibility at this point. We're waiting to hear the final conclusions on that.

Mr. Randy Kamp: Are you expecting to have any role in the Cohen commission?

Dr. Mark Sheppard: I don't anticipate having a role in the Cohen commission. I'm not opposed to bearing witness to it, if called upon. I'm happy to present information from our database if Judge Cohen feels that it fits.

● (1620)

Mr. Randy Kamp: Returning to the specifics of what we've been talking about, let me start with a sort of general statement. In fact, it was a statement made here—you've referred to it already—but let me just bring it back.

When Alexandra Morton was here, she referred a number of times to viruses and bacteria and the threat they pose, the imminent threat, I think it would be fair to say. She also referred to the graphs from the Ministry of Agriculture and Lands. She said, and I quote, that “for a scientist, they're a neon sign warning of drug resistance”.

It sounds as if you disagree with that. Would you like to comment further on that?

Dr. Mark Sheppard: As I said, the DFO scientists, the scientists within the province, the private researchers, and the veterinarians would not consider the graph that she is referring to as a neon sign of drug resistance. As I said, that aspect would have to appear on the differential list. I'd put it at the very bottom. The graph really reflects a count of lice over a period of time. It does not reflect the activity that happened or the environmental conditions that happened or the population dynamics that happened within that period of time. I hope I've explained those components to you today.

Mr. Randy Kamp: You did very clearly, and we do appreciate that.

Dr. Sheppard, what's your relationship to the Association of Aquaculture Veterinarians of B.C.?

Dr. Mark Sheppard: I have been a member of that association for the last 20 years. I play little or no role in the association now other than receiving invitations to the meetings that occur once or twice a year and any letters or announcements they put forth. I don't play an active role.

Mr. Randy Kamp: Who are the members primarily?

Dr. Mark Sheppard: The Association of Aquaculture Veterinarians of B.C. comprises private veterinarians who are working in fish, corporate veterinarians who work for the aquaculture companies, research veterinarians, and veterinarians within the provincial and federal government who are involved in fish. There are some pharmaceutical veterinarians in the group. The active membership is about 10 veterinarians in British Columbia, I suppose, give or take. There are other members who of course receive information, and these would be members from out of province who are keen to hear what's happening in British Columbia from a veterinary perspective.

Mr. Randy Kamp: How many members of that association or other private veterinarians or aquaculture experts disagree with your conclusion that the evidence doesn't show any resistance to sea lice? In other words, are there any experts or aquaculture veterinarians that you know of who are drawing the same conclusion as Alexandra Morton, for example?

Dr. Mark Sheppard: I know of none. In fact, the opposite; they are vehemently opposed to her opinion of that.

That said, again, in the brief that I put forth is a list of research-related activities that are either ongoing or about to start in British Columbia to address this topic of lice and the use of chemicals and the genetics around lice, not because we have drug resistance in British Columbia but because British Columbia is in a very unique position in that we're one of the few areas in the world that has the opportunity to measure these things before it happens.

So this type of activity is going to occur, which will allow us to benchmark the current situation in 2010 and give us the tools, then, to monitor much more closely for responses to drug use from this point forward.

● (1625)

Mr. Randy Kamp: Thanks for that.

In the executive summary of the sea lice management strategy that you provided for us, it refers to the strategic use of Slice, and it says that it is used fewer than two times per finfish grow-out cycle. Perhaps you can just tell us how long that cycle is.

Then it also says that there has been a steady decline in the drug's overall annual use since 2005. It is used less frequently than it used to be, I would conclude there.

It also says in that same section that the abundance of sea lice on farmed salmon has remained low and has continued to trend downward since 2005. So you're using it less and we're seeing fewer lice.

Why are we seeing fewer lice if we're using it less? I guess that's kind of where I'm going with that.

Dr. Mark Sheppard: Those are very good questions, Mr. Kamp.

To begin, the grow-out period for typical Atlantic salmon that get into the cages would be somewhere in the neighbourhood of 20 to 24 months. At the outset it would be 24 months, or maybe 18 to 22 months. It depends on water temperatures, etc.

I said it's used up to two times in that grow-out period. You can imagine that when the small fish come from the hatchery into the ocean in the fall, they're exposed to that influx of lice from new Pacific salmon, so sometimes those small fish, which we call smolts, are treated with Slice before March to reduce any lice load that those small smolts have. The goal is to minimize the amount of lice on the farmed fish in the period from March 1 to June 30, which is the wild fry out-migration period. Those small fish may get exposed once to Slice. The second treatment on that same group of small fish is not likely to occur until the next winter, so on average it's once per year.

Does that answer that question?

In terms of the decline in use of Slice, it is unfortunate you didn't get these graphs, because we monitor this very closely through the province. The graph indicates that the amount of Slice has been declining over the years. What you cannot see, which is very important here, is the scale, which ranges from zero to 1 gram of active ingredient per metric tonne of fish. In 2008, 0.2 grams of the product was used per metric tonne of fish. I can tell you that in 2009 that declined to 0.15 grams. To put things into relative perspective, you'd be hard pressed to get 0.15 of a gram on your fingernail. It's just such a tiny amount of Slice that is used in B.C.

Your third point, Mr. Kamp, was that the information that doesn't generally get out there is that over the last five or 10 years the production of Atlantic salmon has gone up, the mortality has decreased, the lice abundance has decreased, and the use of the control product has decreased. This control product is not used because the farmed salmon need it; it's largely to meet the social expectation of the farmers, the industry, and the province in trying to do what they can to minimize the abundance of lice or the risk of lice transferring into those wild fry in that spring period.

The Chair: Thank you.

Go ahead, Mr. MacAulay.

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

In 2004 about 2 million sockeye disappeared, and in 2009, of course, a bigger disaster. Do you think there's a link there?

Second, what I've heard today differs from a lot of things I've heard up to now. I have been told that the farms were put in improper places, in direct line with the returning wild stock, and that the farmed fish were causing the lice problem.

What you have told us today is totally different. Is that the way it is? To me it's.... We've heard a lot of stuff. Somebody is not right here.

● (1630)

Dr. Mark Sheppard: Yes, and I—

Hon. Lawrence MacAulay: Either we wasted a lot of time, or....

There's another thing, if you get a minute. We were speculating that we might do a review of the fishery on the west coast. Do you think that would be harmful or helpful? Would it make any difference during this time of the hearing?

Dr. Mark Sheppard: Those are all good questions.

I'm thrilled to be here—really—in person. I thank you so much, because there are an awful lot of myths that needed debunking.

The scientists and veterinarians within the federal government and the provincial government are diligent, hard-working people who really try to bring some scientific objectivity and neutrality to the story, but as you know, most citizens have decided they don't want to believe industry, they don't want to believe business, and they certainly don't want to believe government, so we, as provincial employees, don't get the story out. It just doesn't sell in the newspapers. Facts interfere with the story.

It's all on our website. I'm happy to leave you with cards to find this information. It's just that the general public doesn't access that information; they just reach for the newspaper or go on the Internet where, unfortunately, claims and allegations are made, and then we're busy trying to defend them.

Hon. Lawrence MacAulay: Let me just add that we have seen pictures of fish eaten by the....

So you're telling us that it's the wild fish that brought the lice in, not the farmed fish that put the lice to the wild salmon. That's what you're telling us.

Dr. Mark Sheppard: To clarify that, in the fall period at the end of each summer, the wild Pacific salmon come in with heavy loads of lice. I don't know whether you've had the opportunity to come and fish in that period of time, but beautiful silver, robust Pacific salmon come in, and it's not uncommon to see 40, 50, or 80 lice per pink salmon or chum salmon. They bring them to the coastline each year. That's what's unique about B.C. compared with other areas in the world.

I think what you're referring to, sir, is the debate about whether the farms have lice and whether they transmit those lice outward to the small Pacific salmon fry. That is the $64-million question, if you will.

It's no secret that the Atlantic salmon inside the farms will receive lice, and there can be amplification of the populations of those lice inside the cages. In general, in B.C. those numbers are in the ones and tens per fish, as opposed to what others like to compare with—Norway, Ireland, Chile—where the numbers are in the hundreds per fish, or even east coast Canada.

So these are very low numbers. We've set the number of three lice per fish as a trigger value, a very precautionary and very rational number to deal with. In most cases, throughout the year the average on farmed fish is fewer than three. It does rise above that in the fall and winter periods. That's not a problem. What we do is try to minimize the amount of lice on the farmed fish in the springtime period in order to minimize the risk of any transfer of lice to the small fry, which may be sensitive to the lice.

The argument has become, again, is it happening? Are the lice moving from the farms into the wild fry, or are the wild fry getting these lice from another source?

Hon. Lawrence MacAulay: With regard to farm locations, is there no problem with where the farms are located?

Dr. Mark Sheppard: Twenty years ago there were problems with where the farms were located, but there has been tremendous improvement in the last twenty years in their locations.

Again, I think people have put some perspective forth that would allow.... I've heard words like “running the gauntlet”, or “farms everywhere”. I invite you to visit the B.C. coastline. You would be hard pressed to see one farm from another farm. They are at least three kilometres apart, sometimes 50 kilometres apart. There's a vast ocean out there of corridors where pink salmon, fry, wild salmon, can travel without seeing a farm.

It's not running the gauntlet. I don't know what impression has been left with you. The farms are spotted in very remote areas and not generally on the corridors. They are placed generally within bays, inside archipelagos, etc.

● (1635)

The Chair: Thank you.

Monsieur Lévesque.

[*Translation*]

Mr. Yvon Lévesque: I understood from your opening remarks that the disappearance of the wild salmon is not due primarily to lice, but rather, to natural predators, at least in 97% of the cases.

In your opinion, what would you consider to be a natural predator? You talked about predators and I understood you to say that lice is not a predator of salmon.

[*English*]

Dr. Mark Sheppard: Please allow me to clarify, then.

Your question was about my previous statements about the 97% survival of Atlantic salmon inside the cages. I referred to that if we're talking about infectious disease agents and diseases. In other words, fewer than three percent of the farmed salmon usually succumb to that disease or those diseases.

Now, on average, the survival of the farmed salmon is in the range of 90%. The additional mortality is largely due to periods of low oxygen or harmful algae blooms or predation by seals and sea lions, but the loss of farmed fish due to bacteria or viruses is less than three percent. The loss of farmed fish due to lice is zero. The lice in B.C. do not kill farmed fish.

Does that answer your question?

[*Translation*]

Mr. Yvon Lévesque: Yes, it's clear.

Have you observed a bigger decline in the wild salmon population as a result of seal predation? Do you have a method of calculating salmon losses from seal predation?

[*English*]

Dr. Mark Sheppard: Thank you.

Perhaps I should reiterate to make sure I have your question correctly.

You asked whether there was an increase or decrease in wild fish populations and is there any way to measure whether that increase or decrease is due to predators or farmed fish.

[*Translation*]

Mr. Yvon Lévesque: I am talking about seals.

[*English*]

Dr. Mark Sheppard: Again, I think a DFO scientist would be more qualified to answer that question about the pressure of seal predation, or predation in general, on wild fish. It's outside of my expertise. We do know that it's generally accepted that seals and sea lions do certainly follow herring in and eat a number of herring and salmon. They grow up on salmon.

From the farm perspective, seals and sea lions are a significant problem in the winter months. The seals and sea lions accumulate around the farms, and they can literally kill thousands of fish each night. They are very strong animals. What they do—if you'd like me to explain—is just rush the nets, push it through, and grab a fish by its belly or throat. They just suck the internal organs through the net. They drop the carcass there, and they do it dozens of times. It's almost like a cat-and-mouse game. But that's the way they fill themselves up. You get groups of sea mammals that will do that over and over again. The farms have to deal with that.

● (1640)

[*Translation*]

Mr. Yvon Lévesque: That's good to know. Thank you, Mr. Sheppard.

[*English*]

The Chair: Thank you.

Mr. Donnelly.

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

Dr. Sheppard, if I've got it right, essentially you've presented a case that there is no problem whatsoever with sea lice or with the application of Slice. In fact it has diminished as an issue or problem over the years and almost every scientist and expert in British Columbia agrees with that.

I would like to ask three questions. Are you aware of any jurisdictions around the world using Slice that are developing resistance to this drug, and whether any countries are admitting they have a problem with sea lice? If they are having a problem, why does British Columbia not have a problem, and how are we able to manage a diminishing issue when other countries around the world are experiencing possibly the opposite?

Finally, there was a report that was just published in the U.K. by a salmon and trout organization. Have you read that recent report, and can you comment on that report at all?

Dr. Mark Sheppard: Thanks, Mr. Donnelly. Those are all good questions.

The answer to all of those questions, if I can bring you back to the key point, is that B.C. is different. Why is it different? That's been the big question. A number of different things affect the coastline of British Columbia. Let me reiterate those, and then I will answer each of your questions.

The key point is that the Pacific Ocean louse is genetically different from the Atlantic Ocean louse, and that largely explains why we don't see the same pathology, the same disease, the same virulence and pathogenicity, if you will, and ability to cause disease as is seen in other countries. It's a different animal, a different parasite.

The other main concern, of course, is that the farms are a long way apart, with very large distances between them. That's an important factor.

The third factor is that the waves of new lice that come in each year are naive to farming; they are naive to Slice. They haven't been exposed to things, because they come in every August, September, October on the returning Pacific salmon—five different species.

By the way, if I can backtrack a little bit, the genetic difference in the Pacific louse is likely due to the fact that, as it was related to its Atlantic cousin, upon exposure to the five different species through evolution it had to lose something, and it likely lost its capacity to attack one type of salmon. So that's why: they've adapted together, they exist, and we don't see any mortality or disease to it in B.C.

I should carry on and answer your questions, though. Is there resistance in other countries? Yes, there seems to be resistance to emamectin benzoate in most places that have been using it: Norway, Ireland, Scotland, Chile. That is true.

Now, it's a big stretch to extrapolate from those countries with Atlantic salmon and farms that are close together and that use Slice on a monthly basis sometimes to what is happening in B.C. In fact, I don't agree that the extrapolation should occur, given this other information, but people like to do it, and understandably so, because they don't understand the differences .

As a result, then, in these other countries Slice is becoming not very useful. As a result, they have had a much greater opportunity than B.C. to develop what is called integrated pest management. They have different techniques, different products that they can use to control lice in those areas. They have different in-feed products and they also have different topical products, which the fish can be dipped in and exposed to so that the chemical can contact the lice on the outside.

In British Columbia, we just have the one product, which is still very effective. We hope it will be effective for a long period of time, given the way we use it and how little we use of it. That said, the situation we just got through here, with the 20% of the fish that were marginalized that didn't access the in-feed product.... If they're not feeding, they're not getting the drug. Had B.C. had a topical product in which they could have dipped those fish, instead of trying to feed them and get the lice off, then we wouldn't have seen the same scenario. But we don't have those products in B.C.; we just have the one.

Will other scientists agree with everything I've said? If you ask the DFO scientists, the credible scientists who do the lab research and things, I feel in good company, that they would agree that there's insufficient information to suggest that lice on farms is affecting Pacific salmon in a detrimental way.

● (1645)

But the question that still needs answering—I'm not even sure if it's an answerable question—is that what we're.... There are reports, obviously, from both the anti-fish-farm people and the DFO scientists, to suggest that there is a slightly increased abundance of lice on fry nearer the farms. There's an association.

Does that make sense?

In other words, wild fry away from the farms have fewer lice than wild fry nearer the farms. There have been papers by Beamish, for example, that show the opposite of that. There are wild fry that have a significant amount of lice nowhere near the farms.

There is an association, however, with wild fry as they come near the farms to show a slight increase in lice abundance or prevalence—how many lice per are found in general.

But there is no proof to—

The Chair: Sorry, Dr. Sheppard, I have to interrupt here.

State your point of order.

Hon. Gerry Byrne (Humber—St. Barbe—Baie Verte, Lib.): We've received testimony that the amount of literature on this issue is extremely limited. Could we ask the witness if he would be able to provide us with copies of the literature that he just cited?

The Chair: Dr. Sheppard, would you be able to provide copies?

Dr. Mark Sheppard: Gladly. I have them here, if I could leave them with you—at least the cover pages, so that would make them easier to find.

Hon. Gerry Byrne: I appreciate it. Thank you.

Dr. Mark Sheppard: I have the three papers that I've mentioned. There's one by Beamish and one by Jones et al., as well as the Ozawa paper regarding genetics. There certainly is a link within our fish health reports, and I'm happy to leave our fish health reports here as well for anybody who cares to look at them.

The Chair: I'll ask the clerk to retrieve those from you.

Thank you.

Mr. Weston.

[*Translation*]

Mr. John Weston (West Vancouver—Sunshine Coast—Sea to Sky Country, CPC): Thank you, Mr. Chair.

I think that this is probably the most interesting, the most frustrating and the most open debate that I have taken part in as a member of this committee.

[*English*]

We're hearing totally different stories. We're about to confront a tidal wave of responsibility if we consider ourselves wheels in a large machine called the Government of Canada that is now poised to accept this responsibility.

Thank you for coming and for giving your very direct answers.

If there were one question that I could ask, I think it would be this. Given that we are receiving such contrasting stories, what is the epistemology, the theory of knowledge, on what we can do to resolve these things?

Presumably everybody in this debate wants the fish to survive and thrive. There has to be a lot of common ground.

What's the next step, Dr. Sheppard, to move us to a stage where we can compare apples to apples and then do something that will promote that ultimate goal of preserving the fish stocks?

● (1650)

Dr. Mark Sheppard: That's a very astute perspective, Mr. Weston. Welcome to my job.

I have a couple of points, if I may. I'm not exactly sure how to answer your question. It is frustrating. There appear to be two different stories, but I think that's largely because the silent majority, the credible scientists who bring a modicum of objectivity to this entire topic, don't appear in the newspaper or on the Internet. They publish their articles, which are factual, and the average Canadian citizen doesn't read them. It's very technical information. So communication is one problem. I think there needs to be better communication from the industry and better communication in lay terms from the scientific community and from the provincial and federal governments.

Instead what we hear is the vocal minority who, quite frankly, are not aquaculture specialists. Rather, they are anti-aquaculture specialists. They're very good at what they do. They're very intelligent people, very passionate people, and they're very good at communicating to the media and to the Internet. That's what the majority of Canadians hear. Of course, that's what they will believe, because they're only hearing one side of the story.

The next step, apples to apples, is that there is a tremendous amount of collaboration on the go in British Columbia right now between the industry, fish farmers, and the ENGOs who, of course, want things to improve, as do the farmers, as does the province. There's always room for improvement, but there is a tremendous amount of collaboration that is happening. There is joint funding and joint projects. They are both looking at the same things, comparing notes. There is an awful lot of transparency and communication between those groups.

But that's the helpful group. There is another faction that is quite simply anti-aquaculture, and that's where the transparency stops. That's where the information is not generally forthcoming, because, in many cases, the information is abused.

Does that answer your question?

Mr. John Weston: Well, it's a good try. Thank you. I'm sure the Cohen inquiry is going to have the same question.

Can you maybe give us something a little more specific? Infectious salmon anemia is something that Alexandra Morton also mentioned on several occasions. Is that something that is monitored? What can be done about it?

Dr. Mark Sheppard: That's a good question.

It is monitored. It has been monitored for the last eight years. It is on our list of five pathogens of concern provincially, federally, and internationally. Every single sample that we collect at the farms is monitored for that pathogen.

Again, Mr. Weston, I don't know if you got the pre-brief, but there is a summary about ISA virus in there that explains why B.C. doesn't have it and how we plan to not get it.

For those of you who don't know, ISA stands for infectious salmon anemia virus. It has been a devastating infection with high mortality in Atlantic salmon in most of the same countries that we've been talking about that are affected by sea lice: Norway, Ireland, east coast Canada, and Chile most recently. It's not harmful to humans at all; neither are any other fish diseases that we deal with.

The difference again as to why B.C. is free of ISA is that, contrary to what is said, the Atlantic salmon that exist in B.C. right now came in as eggs originally. The brood stock and the production stock from that point forward have been developed in B.C. So live, growing Atlantic salmon are not imported into B.C.

Eggs that may be applied for, to enter B.C., can only come from ISA-free countries or regions. There have been—I don't have the figures, I'm sorry—some eggs imported into British Columbia from Iceland, for example, which is ISA-free. I think in the past—maybe 10 years ago—there were some eggs from Washington State, again ISA-free. We monitor for it, as I said, 150 times a year, 800 samples a year, that sort of thing. There are tremendous biosecurity measures taken.

Those eggs, by the way, that are imported from ISA-free countries need to be screened again. They need to be under quarantine for at least one year and be tested again, etc.

So, touch wood, B.C. has not seen and never will see ISA. That said, Mother Nature has a funny way of doing things, and the virus can be carried by other types of fish. Whether those fish show up on currents from other countries, whether those things show up in the ballast water of ships, certainly it won't be introduced from the fish farming community in British Columbia.

● (1655)

The Chair: Thank you.

Mr. Donnelly.

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

I have two quick comments, and then maybe you could answer that last question I asked about the report in the U.K.

In regard to Mr. Weston's comment, I share some of that. I think we're getting two different pictures here, and it's hard to get to the bottom of what is the accurate picture of what's happening on the west coast. But there are a number of people who have, essentially, a vested interest in seeing a resolved situation.

You mentioned the ENGOs. You referenced their agenda, that either they have an agenda or they don't know enough—I think earlier you referenced that about the information on Slice or sea lice—and that they're able to communicate their position.

I'm just really curious as to why they would put so much energy and effort into something that isn't a problem. If I think of climate change, for instance, that's a whole other story, but it's almost the reverse situation, where we had scientists for years telling the story of this problem but couldn't get that out.

The other comment that I was a little surprised to hear was the reference when I said you've drawn a conclusion that there is no problem. When I asked you that, you said there's insufficient information; there's no information to point to there being a problem. So I wonder how you can conclusively say there is no problem and then say we don't have enough information to say there's a problem. Those are two different things, in my opinion, anyway.

But I wanted to see if you could comment on the U.K. study.

● (1700)

Dr. Mark Sheppard: Before I do, Mr. Donnelly, what was the specific reference? There's no problem to...?

Mr. Fin Donnelly: Again, it's in my words—

Dr. Mark Sheppard: Sea lice?

Mr. Fin Donnelly: Sea lice and Slice; that's what I thought I heard you say today.

Dr. Mark Sheppard: Right. Thank you very much.

To answer your question about the U.K. report, I have not read it. If it came out recently, I have not read that one.

That said, again this falls into the category of extrapolating from one country to the next, extrapolating the types and genetics of fish from one country to the next, and extrapolating the activity of an Atlantic salmon louse from one country to the next. It's a common practice, which is problematic. I'm sorry; I can't comment further on the paper itself specifically.

On your other questions, ENGOs, environmental non-governmental organizations, are very useful groups. They hold everybody's feet to the fire. I'm thankful they're around. The improvements that have happened in the industry within the last 20 years are because there were good questions that needed scientific research and needed to be answered. However, we mentioned earlier there are collaborative ENGO groups that realize aquaculture is here to stay and it can be sustainable and it can be healthy. They're working closely with industry and the government to continue to improve that. Where I make the distinction is between ENGOs and activists. I hope that clarifies it.

There are some people out there who are simply very good at what they do, which is to continue to put sensationalized emotional information into the media. That's how they get support.

That is why people then, not unlike this committee or the people I have dinner parties, think there's a problem. The only access to information they have is what is reported in the media.

Again, I'm very thankful that you invited the province to this table to actually speak very openly to you about information that doesn't get out there. I think part of the reason it doesn't get out there is because if a government agency puts forth this type of information, it instantly looks like it's promoting the industry when in fact it's just corroborating and supporting the same information to citizens who tend to not believe industry, or business, or the government. If information is put forth with more energy, the worry is that it will look like it's the promotion of an industry.

I wrote down “extrapolation” because I think we have to be very careful. The activists like to say it's happening in Norway, and so it's going to happen here. They don't understand the depth of the biology and the epidemiology involved. All they want to do is take people's minds from a historically real problem in different countries and transport the problem to British Columbia in order to stop farming.

In my opinion, the reality in B.C. with sea lice is that it's very much under control. It's highly regulated. It's monitored on a weekly and monthly basis. The information is transparent. We receive it. The farming companies put it out there. There's transparency from the farms to provincial government employees, from the farms to DFO, and from the farms to credible researchers.

The Chair: Thank you, Dr. Sheppard.

Mr. Calkins.

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

Thank you, Dr. Sheppard, for being here.

I have a few quick questions. I only have five minutes. You're giving very thorough answers, but I think you could probably give us the answers fairly quickly for some of these.

In your original presentation, you said the numbers of lice are reported directly by industry to the government website. Can you tell us by whom it's reported? How is it collected? Who verifies it? What controls are in place to make sure the industry is reporting this information accurately?

● (1705)

Dr. Mark Sheppard: Sure enough.

That's part of their fish health management plan and the sea lice management strategy. The farms are required to count their lice abundance once per month and for most of the year. In fact, they count their lice more than that: they count twice a month if their lice counts reach three per fish.

Is that, first of all, clear?

Mr. Blaine Calkins: Are there any observers or anybody to verify? I mean....

Dr. Mark Sheppard: Yes, I understand.

It's a very standardized procedure at the farms, taught by the veterinarians who attend those farms and the provincial government as well.

By the way, just so you know, there's a flotilla of cages often, maybe 10 to 12. The farms are instructed to pick one cage as the reference cage, and that cage will be counted every month. And then the farm is at liberty to pick two other cages on the site at random or at convenience. So in total every month they must count lice from three different cages. From each of those cages they're going to count 20 fish—20, 20, and 20, so 60 fish altogether. The fish are collected by a box seine or a big seine. So many fish are gathered into the corner, thousands usually, and then what happens is there's an anesthetic tote presented there. The fish are scooped up randomly.

By the way, in that collection of fish, back to the situation we were talking about, 80% were eating the medication and 20% weren't. Remember that story earlier on? When you collect these fish, not only do you collect the robust fish but you're likely to collect the slowest, insubordinate fish that are likely to have more lice on them, because they can collect in the corners.

So they collect them up in the corners, they put a dip net in, and they randomly choose fish. They put them into an anesthetic bath, the fish go to sleep, and they count the numbers—but not just the numbers, they categorize all of the different lice stages that they are seeing.

The only thing to add to this is that we audit that on a regular basis, 70 times a year.

Mr. Blaine Calkins: Good. So those audits are compliance audits, then?

Dr. Mark Sheppard: Yes, and we count side by side.

Mr. Blaine Calkins: Is Slice biodegradable or bioaccumulative in any way, shape, or form?

Dr. Mark Sheppard: On Slice, again, that's a better question for an official from Health Canada and the Veterinary Drugs Directorate. It is my understanding of the pharmacokinetics of Slice that it is distributed very well inside the fish. It takes some time, once it goes in the mouth, to accumulate in the mucus and the skin. And then the lice get exposed to it and it kills the lice. But it doesn't last very long in the fish.

Mr. Blaine Calkins: So it's not bioaccumulative, then?

Dr. Mark Sheppard: No, it's not, no.

Mr. Blaine Calkins: Okay.

I have a question for you about sea lice. We talked specifically about Pacific salmon and Atlantic salmon. I would imagine that steelhead and any other salmonid would be a potential host for sea lice. We don't talk about any of the other fish in the Pacific Ocean as potential hosts for sea lice. Are there any other species or families of fish that would involve sea lice in their life cycle?

Dr. Mark Sheppard: Yes, there are. The Atlantic salmon are susceptible to sea lice, as are rainbow trout, as are steelhead, for example, in the ocean. Steelhead, for example, will lose their lice as they go back to the estuary and up the rivers, because lice just don't like non-sea water. So they might get lice when they're out in the ocean, but they lose them by the time they get back in the rivers.

There are two types of lice, mainly. For the purposes of this discussion, there are salmon lice and there are herring lice, many different species of each, but the salmon lice occur on all of the five species of Pacific salmon as well as the Atlantic salmon that are farmed.

We have monitored chinook salmon that are farmed, and they have few to zero lice on them to the point where it's not even worth making the effort to try to count them, so we don't monitor the chinook lice.

Mr. Blaine Calkins: I have one quick question, Dr. Sheppard, if I may, and it's an important question.

In any of the research, has anyone modelled the possibility of a smolt or fry navigating from, say, the mouth of the Fraser River? If you take a look at all of the islands, all of the channels, and you say that the farms are spaced far apart, sometimes 3 kilometres, sometimes 50 kilometres, I think the relevant question is can a fry emerging from the Fraser River navigate to the wintering and the growing grounds? And has anybody modelled the chances of success of that fry going through any channel or any passage between the islands that doesn't contain a fish farm? What would the probability of that be?

● (1710)

Dr. Mark Sheppard: I do not know of anybody who has modelled that. It's probably a good question for somebody like Brian Riddell or a DFO scientist.

Mr. Blaine Calkins: Okay.

Thank you, Mr. Chair.

The Chair: Mr. Blais.

[*Translation*]

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

I would just like to apologize to Mr. Sheppard. I was present, but I was preoccupied at times. Unfortunately, as you know, our attention is also taken up by other issues, including the snow crab crisis in my region in Atlantic Canada. I am currently involved in that issue and that is why I was unable to participate fully in the committee proceedings. For that I apologize. It was not because I was not interested in your testimony or in the subject matter. Thank you.

[*English*]

The Chair: Thank you, Mr. Blais.

Dr. Sheppard, on behalf of the committee I want to thank you very much for taking time out of your schedule to travel here to Ottawa to meet with our committee. We really appreciate your time and the information you've shared with this committee here today.

Thank you very much.

The meeting is adjourned.

Published under the authority of the Speaker of the House of Commons

SPEAKER'S PERMISSION

Additional copies may be obtained from: Publishing and Depository Services
Public Works and Government Services Canada
Ottawa, Ontario K1A 0S5
Telephone: 613-941-5995 or 1-800-635-7943
Fax: 613-954-5779 or 1-800-565-7757
publications@tpsgc-pwgsc.gc.ca
http://publications.gc.ca

Also available on the Parliament of Canada Web Site at the following address: http://www.parl.gc.ca

Publié en conformité de l'autorité du Président de la Chambre des communes

PERMISSION DU PRÉSIDENT

On peut obtenir des copies supplémentaires en écrivant à : Les Éditions et Services de dépôt
Travaux publics et Services gouvernementaux Canada
Ottawa (Ontario) K1A 0S5
Téléphone : 613-941-5995 ou 1-800-635-7943
Télécopieur : 613-954-5779 ou 1-800-565-7757
publications@tpsgc-pwgsc.gc.ca
http://publications.gc.ca

Aussi disponible sur le site Web du Parlement du Canada à l'adresse suivante : http://www.parl.gc.ca