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Chair

Mr. Pat Finnigan

Standing Committee on Agriculture and Agri-Food

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● (0850)

[*English*]

The Chair (Mr. Pat Finnigan (Miramichi—Grand Lake, Lib.)): I call the meeting to order.

Good morning, everyone.

Our committee meeting, pursuant to the standing order, is on the study of genetically modified animals for human consumption.

I want to thank Mr. Shipley. Last week, apparently, you had a great time with him. Now we have to get back to business. I'm just kidding. I know he did a great job.

Again, welcome everyone. With us today for the first hour are the Canadian Biotechnology Action Network and Lucy Sharratt, coordinator, as well as CropLife Canada, with Dennis Prouse, vice-president, government affairs.

Usually we give each member up to 10 minutes for an opening statement, and then we'll proceed with questions.

Maybe we can start with Ms. Sharratt.

Ms. Lucy Sharratt (Coordinator, Canadian Biotechnology Action Network): Thank you very much for the invitation to present. Thank you for taking a look at this issue. We appreciate the opportunity to be before you.

I work with the Canadian Biotechnology Action Network, also referred to as CBAN, which monitors, researches, and raises various concerns and critiques to encourage and engage democratic discussion over the introduction and use of this technology in food and farming. We provide information to Canadians. For example, in the absence of mandatory labelling, we provide a list of genetically modified foods that are on the market.

CBAN brings together 17 organizations on the shared platform of Tides Canada. We are composed of environmental groups, farmer associations, international development groups, and regional coalitions of grassroots community groups. Together CBAN membership raises diverse types of concerns over the use of genetic engineering and brings together a wide and rich range of perspectives and expertise.

How close GM animals, products, and technologies are to the market is actually difficult to determine. The pipeline of GM animals is difficult to monitor because the research is most often owned by private companies, and the majority of research in the lab actually never leads to working products.

We heard last week from regulators that they discussed the product pipeline with companies, but this is not information that the Canadian public is privy to. In Canada, however, we already have two concrete examples of GM animals we can use to discuss the issue and the policy challenges that are raised, in particular the GM salmon.

Canada approved the world's first GM food animal. As you know, that is the GM salmon, which could make its way to market in the next two to three years. The company's initial plan, or stated business plan, was to produce the GM salmon eggs in Prince Edward Island, ship the eggs to Panama, and grow out and process the fish in Panama for the U.S. and Canadian markets; however, the company actually has approval to grow both the eggs and the salmon in Prince Edward Island. The ministers, in their decision to allow commercial production, had approved commercial production anywhere in Canada of eggs and salmon as long as it was in a contained facility on land. There's an ongoing court case, and in December 2015 that production was restricted to P.E.I.

In Canada we have the additional concrete example of the GM pig from the University of Guelph, called the Enviropig. The pig was approved by Environment Canada—because, of course, CFIA has been approving the environmental release of crop plants, but it's Environment Canada that approves GM animals for release. However, the review by Health Canada was halted after the project was removed after pork producers withdrew their support.

I did want to bring your attention to the six reports that CBAN has produced. I think these were sent to you in file format. A lot of the comments I'll provide today are based in our most recent research, looking at the impacts of GM crops and foods after 20 years in Canada.

In the interest of time—although much has passed already—we've structured our comments on five specific policy recommendations and a further final, broader proposal.

First, there needs to be an assessment of economic impact before any GM product is approved for release. The release of some GM products poses economic risks. These risks are not assessed by any department before a new GM product is released. Economic risk-benefit analysis is not part of Canadian regulation. This also means that farmers are not consulted before GM products are approved. In the case of GM fish, fishers, the aquaculture industry, and aboriginal peoples and local communities were not consulted. There is no assessment of risks, but there is equally no assessment of benefits before or after commercialization.

We need only look at the $29-million cost of GM contamination to Canada's flax industry to see a little of what could be at stake. This problem of the costs to some farmers is not new. It was articulated by farmers over the possible commercialization of GM wheat in 2004 and it continues to be heard in the objections to GM alfalfa by Alberta forage groups and 15 farm groups together earlier this year.

The economic risk manifests itself in at least two ways. One, the introduction of a GM product, especially in the absence of mandatory labelling of GM foods, can undermine the market for an entire commodity. This was the concern of apple producers: that the approval of the GM apple would undermine consumer confidence and damage the entire market. Two, if a new product is released and contamination occurs, the result can be market closure.

Second, there is a need to strengthen environmental risk assessment, including a need to assess the long-term system-wide risks of each GM product and the use this technology as a whole. Unfortunately, the risk of contamination is not necessarily diminished with GM animals. There have already been two contamination incidents with GM pigs in Canada, on two separate occasions, at two different institutions, with two different experimental pigs—pigs that were not approved for human consumption. In both cases, GM pig carcasses were rendered for animal feed instead of being incinerated as biohazard. Both contamination incidents were caused by human error. These two incidents highlight the problem of contamination even with large organisms, not just small flax seeds or pollen from flowering alfalfa plants. If we can't contain GM pigs, how can we successfully contain GM salmon or salmon eggs—or alfalfa, flax, or wheat, for that matter?

● (0855)

Third, Canada needs systems for tracking and tracing all GM organisms. Statistics Canada does not track all GM products on the market. Regulatory agencies do not track which products are commercialized and being grown. The government only knows what GM traits have been approved, not where they are or how much are on the market. This means that the government does not have the tools it needs to assess risks and benefits in the long term, or even answer your questions about the market status of the GM apple, for example.

The committee has already heard about the challenges of tagging from the Cattlemen's Association. The seafood industry already struggles to track seafood. It is too common that seafood in the food market is actually mislabelled.

Fourth, Canadians need transparency in regulation. CBAN examined this issue very closely in our GM inquiry. Transparency is missing in almost every step of regulation. In a few cases, there is partial transparency. For example, GM animals are not covered by the voluntary agreement between CropLife and the CFIA that allows the CFIA to post notices of products under review if companies agree. This is called the Biotechnology Notices of Submission Project. This means that at any given time, Canadians do not know what GM animals, if any, are under government review.

Finally, Canadian consumers need mandatory labelling of all GM foods in the grocery store. Lack of transparency is most obviously manifest in the lack of labelling. The issue of GM animals makes labelling an even more urgent issue for Canadians. The issue of GM animals also highlights the range of concerns that could bring a consumer to want GM food labelling, to want to choose. For example, some Canadians have specific ethical concerns.

Twenty years of polling in Canada consistently showed that 80% of Canadians want mandatory labelling of all GM foods. The most recent is 88%. Mandatory labelling needs to be in place before the GM fish hits the market.

In conclusion, the specific proposals that I've outlined are all needed to get regulation and policy close to what it needs to be to address the challenges of GM animals. We could also refer back to the Royal Society of Canada's expert panel report of 2001, which had 53 recommendations for regulatory change. We have articulated these specific proposals because the first GM food animal has already been approved and could be on the market really soon.

But there is a more fundamental need. We need to step back and ask if genetically engineering animals is ethical. Is it acceptable to Canadians? Is it necessary? It is Canadians who need to answer these questions. It is Canadians who need to be asked. There needs to be a moratorium on the introduction of GM animals until Canadians have a chance to be heard and until changes are made to increase the government's ability to regulate GM organisms and food, including tracking and traceability and transparency, including mandatory GM food labelling.

Canada has two decades of experience with GM crops and foods, but they have not yet been evaluated. We need to step back so that we can also evaluate the impacts of GM crops. We need to do this, and then learn and apply any lessons from the release of GM crops and foods before we consider allowing GM animals into our environment and food system.

Thank you.

The Chair: Thank you, Ms. Sharratt.

We're right on the time. That's great.

Now, from CropLife Canada, we have Monsieur Dennis Prouse.

Mr. Dennis Prouse (Vice-President, Government Affairs, CropLife Canada): Thank you, Mr. Chair.

I'm Dennis Prouse, vice-president, government affairs, with CropLife Canada. I very much appreciate the opportunity to present to you today and the invitation you have given us.

CropLife Canada represents the manufacturers, developers, and distributers of plant science innovations, including pest control products and plant biotechnology for use in agriculture and urban and public health settings. We're committed to protecting human health and the environment and to providing a safe, abundant food supply for Canadians.

We believe in driving innovation through continuous research. CropLife Canada is a member of CropLife International, a global federation representing the plant science industry in 91 countries.

As this committee completes the study on one element of biotechnology, it is useful to look back at the success of plant biotechnology, with which Canadians might be more familiar. It's now been over 20 years since the commercialization of the first genetically engineered crops in Canada, and we can look back on where this has led us, what the process was, and what the path might be going forward.

The plant biotechnology industry is a global research-based industry that invests significant amounts of capital and time into the discovery, development, and regulatory approval of a wide variety of plant breeding innovations. These innovations have produced new varieties of crops that are resistant to insects, diseases, drought, and certain herbicides, therefore delivering more predictable yields, improved quality, and access to more environmentally sustainable farming practices.

These innovations have delivered significant benefits around the globe for the environment, consumers, and farmers. In Canada alone, these improved crops raise yields by 32%. Fully $8.3 billion or 71% of Canada's trade balance in crops is directly attributable to innovations in crop protection products and plant biotechnology. These benefits are good for consumers as well as farmers, since without the use of plant biotechnology and pesticides, we would pay about 55% more for food—roughly $4,400 more per family and $60 billion more as a country.

We're very proud of the role that plant biotechnology is playing to improve sustainability. Reduced land use, less tillage, and limited equipment passes save Canadian farmers up to 194 million litres of fuel per year, saving 29 million tonnes per year of greenhouse gases. Without biotech crops and pesticides, farmers would need to use 50% more land than they do today to produce the same amount of food. That's more than the total area of New Brunswick, Nova Scotia, and Prince Edward Island. Far from harming biodiversity, growing more food on less land promotes it.

For the future, research is under way to develop crops that can thrive in changing climate conditions, including drought, excess moisture, and salty soils. Modern agriculture is more sustainable than ever, thanks to innovation, and it's part of the solution on climate change.

The history of plant biotechnology in Canada has been one of tremendous success. That success has been made possible by one key policy pillar: a transparent, predictable, and science-based regulatory system. Canada's science-based regulatory system is world renowned, and since its official formation almost 20 years ago, the Canadian Food Inspection Agency of Health Canada has done outstanding work in safeguarding the health and safety of Canadians and in establishing a regulatory model in which innovation can be commercialized. This is not insignificant, as many nations have regulatory models that lack predictability and timeliness and are rife with political interference in decision-making. Needless to say, this is not a model that fosters investment and innovation.

My previous statements were specific to our experience in plant biotechnology, but I believe the remainder of my thoughts today apply to the path of success for innovation, whether in plant or animal.

In order for Canada to continue to be a leader in any area of innovation and remain competitive on the world stage in agriculture and to realize the benefits these products can provide, farmers require timely access to the latest agricultural tools. To do this, it is imperative that Canada's regulatory pathway for the commercialization of these innovations be timely, predictable, and transparent in order to create an environment that encourages investment.

The most critical element in the commercialization process impacting the development of these capital-intensive research-based innovations in Canada is the regulatory regime for safety approvals. There's a relatively small window for innovators to make a commercial success of a research-based innovation investment, so lengthy and unpredictable review periods are prohibitive for both large corporations and smaller start-ups alike.

Canada does have an opportunity here to be a leader. Canadian regulators are already involved in the international science community in tracking the discussions on these issues. For example, Health Canada and Agriculture and Agri-Food Canada just last week hosted an OECD meeting here in Ottawa, gathering international experts from around the world to discuss the wide-ranging benefits that new gene-editing technology can bring to plant and animal agriculture, aquaculture, the environment, and human health, and they discussed the associated regulatory requirements.

● (0900)

Given this pace of innovation, we believe it's very important for governments to periodically review their regulatory regimes. Such a review requires direct investment in those regulatory programs. For example, Mr. Chair, the Canadian Biotech Strategy Fund in the early 2000s resulted in the development of improved regulatory frameworks and processes that were more efficient for the government and the industry. We believe this played a great part in aiding Canada's success as a plant biotechnology leader. Currently, simply as a benchmark, we're number five in the world.

In the case of plant biotechnology, government would be reviewing the system in the context of two decades of safe and successful commercialization. In that time, there hasn't been a single product submitted for review that has been deemed harmful to either humans, animals, or the environment, in Canada or in any other country with a functioning regulatory system. Trillions of meals safely consumed and two billion hectares safely grown across the globe in that time attest to the high degree of safety inherent in these innovations for both consumers and the environment. For animal biotechnology, this review would be coming at a time when this long-standing area of science is seeing renewed interest in investment.

In support of these statements, CropLife Canada has two recommendations for the committee's consideration that are aligned with the Government of Canada's new innovation agenda, particularly the commitment to ease of doing business, which we believe has clearly signalled that the Canadian government has a desire to modernize its regulatory regimes to adapt and to capture the potential of innovative industries while at the same time maintaining Canada's high safety standards.

First, CropLife Canada would recommend that the Government of Canada publicly commit to improving the efficiency of the approval system for products of both plant and animal biotechnology through direct investment in the regulatory departments involved in their oversight.

Second, CropLife Canada would strongly recommend that the Government of Canada build on its strong science-based regulatory system, leveraging the international scientific consensus on the safety of these products and their domestic history of safe use to develop a tiered risk assessment process which is founded in the principle of risk-based allocation of resources.

This would specifically address plant breeding innovations that have emerged in recent years, such as products of gene editing in CRISPR-CAS9, which are early indicators that the pace of technology development is increasing rapidly compared to the last 20 years. It's essential that a modernized approach to reviewing these innovations be based on a predefined and transparent process that is founded on a definition of risk that is consistent across all the departments and agencies involved in the regulatory regime.

To conclude, Mr. Chair, it's clear that plant biotechnology has delivered clear and measurable benefits to Canadian consumers, farmers, and the environment. These benefits have been facilitated by successive Canadian governments having the foresight to maintain a transparent, predictable, and science-based regulatory system. For both plant and animal biotechnology, we believe that maintaining the integrity of that system and respecting the scientists within it is critical to fostering future innovation in Canada. Equally as important to fostering innovation will be clear measures to improve the efficiency and timeliness of that regulatory system.

Thank you, Mr. Chair. I appreciate your time.

We look forward to answering any questions the committee may ask.

● (0905)

The Chair: Thank you, Mr. Prouse. Thank you both for your introduction.

We will now move into the question round in which we have six-minute questions, and I would ask each member to say if they want one or both of you to answer.

The first round will go to Mr. Shipley, for six minutes.

Mr. Bev Shipley (Lambton—Kent—Middlesex, CPC): Thank you, Mr. Chair.

I want to thank the witnesses for coming.

Mr. Chair, prior to the start of questions, I wouldn't mind reading into the record a motion. It is as follows:

> That, pursuant to Standing Order 108(2), the Standing Committee on Agriculture and Agri-food conduct a pre-budget study on the effects that the recently-announced, Liberal Government carbon tax would have on the agriculture sector and producers; that this study be comprised of no less than four meetings to be held at the committee's earliest convenience; that departmental officials from Agriculture and Agri-Food Canada and Environment and Climate Change Canada be in attendance for at least one meeting; that the committee report its findings and recommendations to the Minister of Agriculture no later than February 15, 2017.

The Chair: Thank you, Mr. Shipley.

Mr. Bev Shipley: I will start my questioning. For the most part, I'll identify who I want to answer.

It's interesting. We have two pretty much opposing opinions here.

Ms. Sharratt, it would seem that in Canada.... In particular, I can talk about my area. Soybeans in my area, or 90% of them, are GMOs. Likely close to 98% of the corn grown in the area is GMO. Many of them, a high percentage of them, are stacked for herbicide and pesticide traits, and yet you say that there are no better yields and there is no improved income and that it actually raises the price.

I'm wondering what you're telling my farmers, who are actually using these products. I can tell you that for the most part they are very successful, well educated, and well informed. They do their work, they know the bottom line, and they know what they need to grow. You're saying that because they're using these, there's no benefit to them. I wonder if you could help to explain that.

● (0910)

Ms. Lucy Sharratt: Thank you.

What you've referred to is a summary of some of the results of our report on the question of the benefits and impacts of genetically engineered crops on farmers, including farm income.

What we did find is that there's no evidence that the GM traits specifically are related to improved yields. We know that in canola, the best germplasm also has GM traits put on top of it, and there's no study in Canada specifically that shows the increased yields are specifically attributable to the GM traits, for example.

Mr. Bev Shipley: So basically you're saying the farmers don't know what they're doing because—

Ms. Lucy Sharratt: No, that's not what I'm saying.

Mr. Bev Shipley: —they don't see a benefit.

I'm asking you, Mr. Prouse. You actually commented significantly, because we don't have the same background in terms of animal GMO yet, but certainly the background in terms of what agriculture has been able to benefit from, at least the farmers, but also.... Listen, if it's just the farmers and nobody else wants them, I would also suggest that the agriculture community actually has a pretty good idea.... If you grow something and you can't market it, then, to follow what Ms. Sharratt said, there actually is no benefit.

Mr. Dennis Prouse: I'll say a couple of things very quickly, Mr. Shipley.

Number one, our members would spend about $150 million and take about seven years to bring a product to market. That's from lab to seed. It would be about that length of a process and that much money.

I would also defer to Stephen Vandervalk, who is now the past president of the Grain Growers of Canada. He appeared before this committee a few years back and told the committee—I believe I'm quoting him correctly—that every spring, the most expensive seeds sell out first. I always leave it to a farmer to put it pretty succinctly and pretty directly.

Mr. Bev Shipley: I always thought that when you're buying something for the long-term benefit, sometimes the best quality is actually the best for an individual. I'm shocked, quite honestly, at the position taken by Ms. Sharratt and her organization, which quite honestly is funded a lot by Tides Canada and the Sierra Club, which oppose pipelines and any advancement in agriculture.

I want to talk about transparency in terms of being able to get these products ready for market. There's no involvement by the agriculture community. My understanding is that if you can't market it.... Does the farming industry not have any say in what has been produced and grown as a GMO? That isn't what we heard last week, but do they not have any say in terms of when it goes to market?

Look at the Enviropig, for example. It didn't go. It got stopped—actually, the pork producers.... I would suggest that it has a lot to do with market—maybe the naming—and with the market evaluation they saw. Would that have any influence? I'll ask both of you for a very quick response.

The Chair: Answer quickly, please, because we have about five seconds.

Ms. Lucy Sharratt: The Enviropig was a unique situation because pork producers had invested in that research and then withdrew support.

Apple producers—the BC Fruit Growers' Association and the Quebec apple producers' federation— asked the Canadian government not to approve the GM apple because they feared for their market, and that wasn't considered.

The Chair: We'll now move to Mr. Breton for six minutes.

[*Translation*]

Mr. Pierre Breton (Shefford, Lib.): Thank you, Mr. Chair.

Ms. Sharratt, I am particularly pleased to have an opinion that differs from the opinions we've heard to date as part of this study. People and groups have hesitations and concerns. It's our duty to hear what you have to say and to properly analyze the concerns.

Your spoke about regulation. We don't know where these products may be grown or what quantity can be found on the market. There is some degree of regulation once the products have been approved by the various government authorities. I'm delighted that you want stricter regulations and policies to ensure greater transparency in labelling. I'm happy that you're focusing on these aspects.

I want to hear your thoughts on regulation. You made 20 recommendations, and you weren't able to list them all. Can you elaborate on the regulatory aspect?

● (0915)

[*English*]

Ms. Lucy Sharratt: Thank you very much. *Merci.*

There are many steps within the regulatory process that all need more oversight. From seed to table, there needs to be traceability of genetically modified organisms. Even at the experimental research stage, we've seen contamination occur. There definitely needs to be more government oversight, even at the research stage, that includes providing information to Canadians about which genetically modified products are under review.

Once the products are approved, Canadians need to know if the Canadian government actually knows whether they're on the market or not, and if they are, where they are. Statistics Canada could pick up some of that work. Then of course there is the the matter of traceability through the food system, so that from farm to table, that genetically modified organism is traced and labelled.

Then there's the whole question of the regulatory system itself. The system has existed for 20 years. For 15 years, it hasn't been renewed as per the recommendations of the expert panel of the Royal Society of Canada. After 20 years, we have an opportunity. Especially now if we're going to talk about new techniques and new applications to organisms such as GM animals, we have a unique opportunity and, I would say, a necessity to look at the entire regulatory system and what's needed to be up to date.

[*Translation*]

Mr. Pierre Breton: That's interesting.

Studies have been conducted in recent years. A Quality of Life and Management of Living Resources study was conducted by ENTRANSFOOD. I don't know whether you heard about it. The study concerned the risks associated with toxicity, antibiotic resistance and allergenic effects.

Are those things mentioned in your 15 other recommendations? Can you speak more about them?

[*English*]

Ms. Lucy Sharratt: The question of the use of antibiotics in animals is one that's very relevant to GM animals. In some cases, GM animals are discussed in relation to solving that problem, but we've already heard from other witnesses that management is most often what's turned to, and we already know what the management solutions are. Genetically modified animals like the GM fish could potentially increase the use of antibiotics, and that impact also needs to be part of an assessment of genetically modified products. Where do they fit into the management in any given sector? Where do they fit into the bigger picture of where our food system is taking us, and what are the other connected problems that exist?

[*Translation*]

Mr. Pierre Breton: There is a whole discussion about the labelling of genetically modified food. I know your stance is to ensure labelling. Can you elaborate on the labelling issue please?

[*English*]

Ms. Lucy Sharratt: Thank you.

It's been 20 years now that consistently over 80% of Canadians have said they want labelling. There have been many private members' bills brought forward. There have been opportunities to take up labelling.

We do have, as you heard, a voluntary labelling standard. It has not been put into use, because companies do not want to label their products voluntarily as genetically engineered. This is why we think there needs to be mandatory labelling. People want to know where that food is from. As I discussed, we think traceability is really important for a number of other reasons as well. The transparency lands, for consumers, in the grocery store shelves.

● (0920)

[*Translation*]

Mr. Pierre Breton: Thank you.

The Chair: I will now give the floor to Ms. Brosseau for six minutes.

Ms. Ruth Ellen Brosseau (Berthier—Maskinongé, NDP): Thank you, Mr. Chair.

Thank you to the witnesses for their presentations.

It's important to continue this debate in a respectful manner. I know the two opinions are completely different. I find the debate and discussion today important and very interesting.

My questions relate to my colleague Mr. Breton's questions regarding the mandatory labelling of genetically modified food. During the 42nd Parliament, my colleague from the Sherbrooke constituency tabled another bill to label all genetically modified food destined for human consumption. Since around the year 2000, labelling has been mandatory in the European Union.

To be fair, I'll direct my questions to both witnesses. Do you know how the agri-food industry reacted to this measure? How did consumers react? Was it good news? Can you also tell us whether the mandatory labelling of GMOs generated costs for the companies that produce the food?

[*English*]

Mr. Dennis Prouse: I think it's important to understand the differences between health and safety and marketing. I believe Mr. Mayers from the Canadian Food Inspection Agency was here recently, and he talked about what the process is for CFIA in regulating foods, which is safeguarding the health and safety of Canadians. We know that GM crops do not pose a health and safety risk to Canadians. There is now global consensus on the safety of the crops.

Now it's a marketing question. Does Health Canada or CFIA have a role in marketing? It's an interesting question, one that is going to touch on any number of areas, because you will now have changed the entire rationale for CFIA on food labelling.

I would add one other element. Our neighbours to the south have been through this issue. They've wrestled with it for quite some time. Very recently they passed a bill, and the solution they came up with was smart tags. Now they have to go through a regulatory process for the next two years in determining how that's going to go.

The smart tags also speak to traceability. I would suggest to you that given the integration of the two marketplaces, that may be where this is heading.

Our bottom line is that we do not wish to see a health and safety risk implied to Canadians where in fact none exists. That doesn't provide more information to Canadians. I would argue that it provides less.

Ms. Ruth Ellen Brosseau: Thank you.

Lucy, go ahead.

Ms. Lucy Sharratt: Recent work in the United States has actually provided us with some really good studies on the possibility of increased costs, which would be pennies a year per household, a really minimal increased cost. We've looked at why Canadians want GM foods labelled. In 2015, we commissioned a poll by Ipsos Reid: 87% of Canadians who did want labelling just wanted to know what food they were eating, and 30% had ethical concerns. People want to see labelling for different reasons. Food costs in the European Union aren't any higher than they are in Canada because of labelling.

I think the rationale for CFIA to label is exactly the same rationale or diversity of concerns over why we label "Made in Canada" or why we label irradiated foods. There is a precedent here for labelling for non-health and safety reasons, and Canadians have clearly been asking for this for 20 years.

● (0925)

Ms. Ruth Ellen Brosseau: I think what often gets brought up is a lack of transparency and consumer *confiance*. I think a lot of Canadians are maybe still want genetically modified labelling. I think you said the latest report was 88%, maybe because there's this lack of confidence.

What role does the federal government have in making sure that Canadians have confidence in products here in Canada, whether it's GM or anything else? How can it be improved in terms of making sure there's better transparency when we talk about approving certain foods in our system in Canada? What needs to be done to make sure that Canadians have the right information?

Ms. Lucy Sharratt: Thank you. I think this is a really important question, because we have heard a lot about this question of consumer confidence and the role of Canadian regulators in bolstering consumer confidence.

It's been 20 years that over 80% of Canadians have wanted labelling. It does then appear that it's not just a matter of the Canadian government communicating about the regulatory system to Canadians. In fact, there needs to be concrete change to the regulatory system to improve it so that it is in fact more stringent and more transparent. In that transparency, in that increased and improved regulation, then I think we would see improved confidence. I would say that would not remove, also, the demand for mandatory labelling.

The Chair: Thank you, Ms. Sharratt.

Now it's Mr. Longfield for six minutes.

Mr. Lloyd Longfield (Guelph, Lib.): Thanks, Mr. Chair.

Thanks to both witnesses. It's great to have diverse opinions at the table and to be respectful in the way we're discussing this issue. The approach we're trying to take is to get as much diversity into our conversation as we can, so I appreciate getting this chance.

By 2050 we're looking at increasing our output of food by 50%, on a smaller land base all the time. How do you see your organizations contributing to our drastic need for growing more food and raising more food in a diminishing land space?

Perhaps you could go first, Ms. Sharratt.

Ms. Lucy Sharratt: We continually work with farmer associations that are talking about these issues. One of the first things we need to understand is that across the world, small-scale farmers provide most of the food that's produced and eaten. We produce enough food now to feed 10 billion people, which is what we need in 2050. We waste one-third of the food that's produced in the world.

In addition to the question of agricultural productivity, I think there are other questions that will help us come to this answer of how to feed the world. This is part of the bigger picture that we're also looking at, as well as what type of environmental impact comes from different production practices.

Mr. Lloyd Longfield: Thank you.

Mr. Dennis Prouse: I think our role is to try to encourage governments to have the regulatory environment needed so that innovation can thrive. We believe that when innovation thrives, Canadian farmers win and Canadian farmers can produce more. We've certainly seen that track over the last 20 years. We think we will continue to see that, provided there's a climate for innovation.

More globally, as you referenced, the world population is going to be nine billion by 2050. That's the United Nations' median projection. Instead of talking about shipping excess food from the first world to developing countries, we think we need to talk about how we help farmers in emerging countries grow indigenous crops there in a more productive way. I think innovation has a huge role to play in that.

Mr. Lloyd Longfield: Right. Thank you.

There's also the role of universities in determining your policies, your regulations, and your dialogue. We're looking at social licence, environmental impact, and economic impact, which you've mentioned in your presentation. Where do universities play a role in what you're bringing forward to us, Ms. Sharratt?

Ms. Lucy Sharratt: Universities provide some independent research that's necessary to look at all of these questions. We would like to see more engagement from universities on agronomic and economic questions. We think there is a need for reinvestment in public plant-breeding in Canada.

● (0930)

Mr. Lloyd Longfield: More directly, are you working with universities? Are they part of the 17 organizations that you're working with?

Ms. Lucy Sharratt: Not directly, no. There are various partnerships and community-based alliances and discussions that happen.

Mr. Dennis Prouse: We see universities as a tremendous hub for agriculture innovation. Certainly your riding features one of the most dynamic agricultural research hubs in the country. The University of Saskatchewan features another one, and Laval is another. When it comes to innovation, we believe that a rising tide lifts all boats, so to speak, with private sector innovation on campuses and public innovation.

Mr. Lloyd Longfield: We are trying to take the science-based approach in all of our decisions as a government, and the role of universities is critical.

At the last meeting, we had CFIA, the Department of Agriculture and Agri-Food, and the Department of Health all testifying that there was no difference between GMO salmon and non-GMO salmon in nutrition and food safety. They talked about limiting the risk by controlling the reproductive capacity of the fish.

I think there is a risk analysis that's going on, but there is a gap that the Canadian Biotechnology Action Network is seeing. What's that gap that we're missing?

Ms. Lucy Sharratt: Thank you for that question.

In the case of fish, there's an ongoing court case that's asking that question, and it's saying Environment Canada needed to assess what the impact of escaped fish would be on the environment and not just look at the containment facility itself and decide that it was enough. There's that question, but when it comes to genetically modified plants, for example, we can ask what kind of long-term risk assessment is being done. How do we look at the use of herbicide-tolerant plants, for example, and how do we see the emergence of herbicide-resistant weeds and the management response to that? Where is the government evaluation of that trajectory?

I think we could also apply that to GM animals. If we allow GM fish to be produced, then what will happen if they escape?

Mr. Lloyd Longfield: Thank you.

We have 20 seconds left.

Mr. Dennis Prouse: You touched on something very important. What Health Canada does is regulate for outcomes, and they don't regulate the process. Given how complex the process is becoming, and will continue to become, we think the CFIA is on the right track to protect the health and safety of Canadians. You regulate outcomes. That's the most predictable and transparent way in which to do that.

The Chair: Thank you.

For the second round, we will start with Monsieur Drouin.

[*Translation*]

You have six minutes.

[*English*]

Mr. Francis Drouin (Glengarry—Prescott—Russell, Lib.): Thank you, Mr. Chair, and thank you to the witnesses for being here.

My first question is to Ms. Sharratt.

I'm getting the sense that your organization is against GMO products. Is that correct?

Ms. Lucy Sharratt: We wouldn't describe that as the conclusion of our work, no.

Mr. Francis Drouin: Okay, but just from your statement, you're obviously concerned about GM products. Is that correct?

Ms. Lucy Sharratt: Yes, we're very concerned in a number of different ways.

Mr. Francis Drouin: The testimony that we heard last week.... I want to make sure that when we talk about GM products, it is a science-based approach. Are there scientific studies that you've read that are causing concerns for you?

Ms. Lucy Sharratt: We have discussed, in one of our reports, the question of scientific consensus in the scientific literature, which does not exist. We see in the public that there's a discussion back and forth about what the science tells us, and there's controversy. We also think there's the issue of what Canadians tell us about what they want in agriculture and food. In addition to the science-based questions before regulators, there are also economic and perhaps ethical and social questions to be asked.

On the science, the answer is not concluded. The questions continue to be explored, and that's the scientific process.

There are many issues in Canadian regulation that point to the problems of science used in Canadian regulation. It is not, for the most part, peer-reviewed science, for example.

Mr. Francis Drouin: Last week we heard from Health Canada and Agriculture Canada, and they assured us that their scientists are well educated and have the proper training to do the analysis. When companies come forward, it takes about 10 years to put a product to market, and then Health Canada and Environment Canada will do an analysis of this. It's a science-based approach. Are you saying that you're not confident in that system?

● (0935)

Ms. Lucy Sharratt: What we heard from regulators was an implication that the regulators are performing the function of peer review in the absence of peer review. What's happening is that corporations are providing data packages to Canadian regulators. Those data packages are kept as confidential business information. They're not available to the public. That equally means it's not peer-reviewed science. There are some exceptions with one or two studies.

Systemically, the lack of transparency in Canadian regulation is also attached to this question of whose science it is and whether that science is peer-reviewed.

Mr. Francis Drouin: But we've also heard from Health Canada that they collaborate with other governments and with the WHO. Don't you think the WHO or other health organizations would have issued major health concerns if GM products did have specific health concerns for human consumption?

Ms. Lucy Sharratt: I think it's really important that we look to regulators in terms of what they're examining, which is product-by-product regulation. The question of GM food safety is actually about the GM trait and its application, and each product is different and requires its own regulatory process. That's where these questions come into play. Then there's also an ongoing controversy over different risk questions out there in the global scientific literature.

Mr. Francis Drouin: That brings me to my next point, about GM labelling.

I'm concerned about legitimate health concerns for somebody who has, let's say, diabetes. If we're doing this for purely marketing reasons, labels don't have all the space in the world. They're very tiny, and somebody with diabetes needs to know how much carbohydrate and sugar they consume. If we're including something for purely marketing reasons, then we're sacrificing something else.

That's where—in my personal view—I don't think the government has a role to play. If it's only for health and safety, government plays a role, but if it's for marketing, don't you believe that the government shouldn't be involved?

Ms. Lucy Sharratt: I do think that if Canadians are asking to know whether genetically modified foods are on our shelves so they can decide whether to put that product in their grocery basket or not, I think it's incumbent on the Canadian government to provide that information. I think part of the study that could be done is on whether that sacrifices space. I would hope it doesn't. There are a lot of competing labels and pieces of information that belong on products, and 80% of Canadians want this other information to be on that product label as well.

Mr. Francis Drouin: I wonder if you believe the poll results would be the same if we asked the question, “If we include GMO labelling, are you okay with us sacrificing legitimate health concern labelling on product labelling?”

Ms. Lucy Sharratt: Yes, I think we would need those facts in order to ask that question.

Mr. Francis Drouin: I have a question for Mr. Prouse.

Can you talk to me about what your industry does in terms of ensuring that legitimate health concerns are addressed before a product hits the market?

Mr. Dennis Prouse: You talked a little bit about the length of time. It goes through the lab, it goes through field trials, and then it finally goes in for submission. That's a very lengthy piece.

We often hear, “You can't trust corporations; you can't trust their science.” The question I would ask people is if there is any corporation that would spend $150 million and seven to 10 years of development time on a seed in which they have no confidence. When not one seed submitted over a 20-year period has ever been shown to have health or safety concerns, either in Canada or anywhere globally, I would further suggest that the track record is very good. I think the proof is in the track record and I think safety for Canadians is tied within the record of CFIA and their collaboration globally.

The Chair: Thank you, Mr. Prouse.

Thank you, Monsieur Drouin.

[*Translation*]

Mr. Gourde, you have six minutes.

Mr. Jacques Gourde (Lévis—Lotbinière, CPC): Thank you, Mr. Chair.

I want to talk about the cost-benefit ratio, and I want to know whether the consumer or the producer benefits. It's well understood that, in the past 15 to 20 years, biotechnology has dramatically improved plant and grain yields. Take soya, for example. About 15 years ago, in my region, we were very happy when one tonne of soya was harvested. Today, that's considered a poor yield, since each acre now provides 1.35 to 1.50 tonnes. The seed companies have made great strides.

Reseach results in costs that are transferred to the producers. If a company develops a seed that cost $150 million to research, in the next 10 years, the seed companies will undoubtedly transfer the cost of the research to the producer. However, the producer won't necessarily be able to obtain a price for the grain that differs from the market price. Sometimes, things are going well, the prices are good and everything is fine. But when global prices drop, the price of seed doesn't decrease. In general, the price increases by 2%, 3% or 4% a year, and this doesn't affect the sale price of products on the market.

In the future, do you think the pendulum will swing in favour of producers, or will the price of seed keep increasing? The producers risk being caught in a no-win situation.

They don't have a choice. They need to get their seed from somewhere, and practically all the seed is genetically modified. This generates costs, and they can't predict the market price in the coming years.

● (0940)

[*English*]

Mr. Dennis Prouse: You're talking about the availability of seed to farmers. I'll say a couple of things very quickly.

First, I think if you asked all of the different grower groups and all of the different agricultural groups, I think they'd say the selection of seeds that they have available for purchase every year continues to be very good. There's a wide variety. The Canadian Seed Trade Association could respond to that as well.

There's one other interesting development that I think is instructive for the committee. In the last couple of years, the first generation of GM seeds has come off patent. That was a new development, obviously. The question was what impact that would have on the industry. Frankly, it hasn't had very much of an impact at all, because the demand from farmers is for the newest generation of seeds. The demand for seeds that went off patent was exceptionally low. It's interesting to watch how the marketplace moves and how the marketplace works. We think that there's great choice available for farmers. That global marketplace is going to evolve, and Canada is just a very small part of it.

Ms. Lucy Sharratt: We're very concerned that the price of seed continues to rise, as does the price of all agricultural inputs. Seed prices are rising faster than most. With the potential merger of Bayer and Monsanto and the increased consolidation of not just six top seeds and pesticide companies but three, controlling perhaps 60% of the seeds and pesticide market, there will be more pricing power in fewer hands. The trend is increased cost for farmers. It's farmers who are paying for that. Farm debt is not being alleviated.

[*Translation*]

Mr. Jacques Gourde: Given the concentration of the large companies that will control both seed production and pesticide products, do you think any practically exclusive seed could be rented or loaned to farmers? Do you think the large seed companies will take these products and create other products destined for widespread human consumption, and the farmers will become mere intermediaries in terms of production and their land's contribution to humanity?

[*English*]

Ms. Lucy Sharratt: Already in the major crops of corn, canola, and soy, farmers are in some cases having a difficult time finding non-GM seed. Given the investment in genetic engineering by the big seed and pesticide companies in whichever crops they decide to focus on, whichever traits they decide to focus on, one of the outcomes of the increased corporate concentration is perhaps this disincentive to innovate and focus on a diversity of products for farmers.

Mr. Dennis Prouse: I would simply encourage you and other committee members to hear directly from grower groups on this issue. The grower groups are here. They're represented in Ottawa. They're represented more broadly. There is a seed trade association and a seed growers association. I'm very confident that you'll find that they feel they do have a wide selection of seed available to them and that they do have choices. Again, I would encourage you not to take my word for that. There are grower groups available that could speak to that question directly.

● (0945)

[*Translation*]

Mr. Jacques Gourde: On Saturday night, I sat down with the pork producers in my region. They seemed very worried about the future, because there appears to be a vertical concentration between the geneticists that give them the genetics and the agri-food companies that provide the food. They take the same pork in their own slaughterhouses to export to niche markets.

So, the producer is at home. Basically, he provides his time, buildings and land for a set amount, from $16 to $22 for pork. The producers have little choice left but to keep pork. It's a way to keep people paid, but they are self-employed workers who give more of their time.

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

[*English*]

Peter, if it's okay with you, we might have to do a three-minute section because we're going to be short of time.

Thank you.

Mr. Peter Fragiskatos (London North Centre, Lib.): Sure.

I'm not a member of this committee. I'm sitting in for a colleague today. I am very interested in agriculture because I have a huge interest in the developing world. The United Nations says that 795 million people, or 10% of the world's population, are chronically undernourished.

Don't we need to look at ways to grow food faster, more efficiently? I know there are animals that are resistant to disease or that have an increased nutritional value for the consumers. I know there are studies in place on cattle that don't get mad cow disease or transmit it and on goats that produce milk containing an enzyme that could prevent deadly diarrhea in a million children each year.

Ms. Sharratt, could you comment on that? There seems to be a great deal of potential in terms of genetically modified animals for dealing with some very severe problems of poverty, and specifically undernourishment, in the developing world.

Ms. Lucy Sharratt: Thank you.

Certainly the issue of malnourishment is in fact the product of poverty. It's less a problem of agricultural productivity and more an issue of wealth distribution, access to land, and access to the tools to work that land. This is an important question when we look at genetically engineered livestock that would be bought. These are patented organisms, just like genetically modified crops. Farmers would pay a price for accessing seeds and genetics. Right now, small-scale farmers across the world feed their communities with livestock that they control. If we look to the future role of genetic engineering in these really important social questions, we also need to look and see how impracticality would work as a dynamic in small communities.

Mr. Peter Fragiskatos: I have less than a minute left.

A two-year review recently completed by the National Academies of Sciences, Engineering, and Medicine examined 900 studies. It found "...no differences that would implicate a higher risk to human health from eating GE foods than from eating non-GE counterparts" and "...little evidence to connect GE crops and their associated technologies with adverse agronomic or environmental problems."

That's a noted organization commissioning a study that looked at 900 studies. When we examine this issue, we have to do so from the basis of what the evidence says. What do you say when we have a study that seems so robust?

Ms. Lucy Sharratt: I would say that it's excellent that such studies are done and that there continues to be investigation in the international community. That includes the continued safety studies that, unfortunately, there are not enough of—that is, long-term independent studies on different GM products. We need to review all of those studies, certainly, but we also need to continue doing the experiments that would allow us to investigate all of those questions as well.

The Chair: Unfortunately, time has run out.

I want to thank Ms. Sharratt and Mr. Prouse for being here today. It is a very interesting debate. I think the idea is to bring in different opinions, and I really thank you for appearing before this committee.

We shall now break for two minutes to change the panel for our second hour of testimony.

Thank you.

● (0945)

(Pause)

● (0955)

The Chair: For the second hour of our committee hearing we have with us BIOTECanada, Andrew Casey, president and chief executive officer; also, from AquaBounty Technologies, Inc., we have Dave Conley, director of corporate of communications.

Welcome, gentlemen, and thank you for your presentation here today.

We will begin with an opening statement of 10 minutes by each of you.

Mr. Casey, perhaps you want to start.

[*Translation*]

Mr. Andrew Casey (President and Chief Executive Officer, BIOTECanada): Thank you, Mr. Chair.

Thank you as well to the committee for giving us the opportunity to share our view on this important matter.

[*English*]

Thank you very much for this important opportunity. I am with BIOTECanada.

As a way of introduction, BIOTECanada is the national trade association representing Canada's biotech industry. We have over 220 member companies in our association. They are spread across the country in pretty much every region, usually centred around clusters in all of the provinces and usually centred around clusters where there is an expertise. Our members include large multinational pharmaceutical companies, but the vast majority of our members, about 85% to 90% of the members, are small precommercial companies that are in the throes of taking an innovation and moving it forward. As an example, to my left is AquaBounty, one of our member companies, but we also have a number of other companies.

One is a company called Agrisoma. Agrisoma works with a version of a mustard seed that has been genetically modified. It can be grown in fields that are unusable for other plants because either the soil is not nutritious enough or there is not enough moisture or nutrients.

They take that mustard seed, they crush it and extract the oil from it, and they turn it into jet fuel. The jet fuel can be used in jet engines without adding any fossil fuel to the mix. The plane has flown and the plane does not have to be altered in any way, shape, or form. The plane that has flown is the NRC plane that is out by the airport. It has gone up in the air. Of course, what they do is send along a little sniffer plane right after it to see what emissions come out, and because there is no fossil fuel in the mix, the emissions are greatly reduced.

The story gets a little bit better, because when you go back to that mustard seed that's been crushed, the meal that comes out of it after the oil has been extracted can go back into the food chain. In a world where we're dealing with those pressures, there is an amazing solution to handle some of those pressures.

We have other great examples. In the health space, BIOTECanada has members that are developing new vaccines, new medicines. As an example, there is an individual out in New Brunswick who has figured out that there is a paralytic quality in the shrew's saliva that has a peptide. He is looking at turning that into a cure for a rare form of ovarian cancer. Out in Vancouver there is a company that has figured out that in the malaria-bearing mosquito there is also a protein that can be used for attacking cancer. These are the types of innovations that we're seeing across this country.

Another company that was referenced this morning is a company in B.C. that is taking an apple and turning off one part of it, so that the apple does not brown when it's cut or bruised. These are phenomenal innovations. What I'd like to do with my time today is explain why it's important.

You talked a bit about this in the earlier session, but we have a planet that has around seven billion people right now. It's rapidly moving to nine billion people. That's bringing with it some very significant challenges. We have new mouths to feed, and by a number of estimates, 50% to 70% more food is going to be required to feed those people. That's important. It's also a fact that the rapid increase in population is putting enormous pressure on this planet. We need to adjust the way we produce and manufacture. There's no question about it. We need to not only mitigate against future impact on the planet but we also have to adapt to what is already a changed planet.

That is the solution that biotechnology represents. Addressing those challenges is absolutely a social imperative for us as a population, as a society, and we need to get at it as quickly as possible. For Canada, that represents an enormous economic opportunity. We have a long history of biotech innovation in this country, dating back to some earlier developments of vaccines, whether it be in the polio space or in the development of insulin.

In our more recent world, and certainly part of this discussion today, we have canola. This is one of the greatest crops this country has ever had. The China deal underscores exactly how important it is, an estimated $2.5 billion. There is a huge economic opportunity in addressing the challenges that are coming with global population growth. Canada is very well positioned to address those challenges. As I said, the ecosystem that's across the country and found in every province is very healthy and diverse There is lots of innovation coming out of our universities and being driven forward.

● (1000)

The history that we have in this country of developing this innovation has also led to another very important strength for this country, which is our regulatory process. Canada is among the world leaders at regulating innovation, at making sure that products are safe and efficacious for human consumption and also for the environment. Adding more problems to our already challenged environment is not really good for anybody.

Canada is now well known around the world as having one of the best regulatory systems for oversight. This is a huge, global competitive strength for the industry. I think without it the industry would not be as globally competitive, so we advocate that we keep pace. The innovations are happening at a very rapid rate, and we need to keep pace with those innovations. Our science has to be as rigorous as possible; there's no question about that.

Some of the emerging challenges, such as Zika and Ebola, require very rapid responses. There's a company in Quebec City that's taking tobacco leaves and growing vaccines. They're able to close the gap. A normal vaccine can take anywhere between 12 and 18 months to develop; they are able to grow that vaccine in weeks. We can respond very quickly to these emerging challenges with that. That doesn't mean we can just let everything happen without any regulatory oversight. It's very important that our regulatory oversight continue.

We have a great opportunity. It's a great economic opportunity, but we have to make sure we're doing it right.

I will now turn the microphone over to my colleague, who can explain in a bit more depth how strict our regulatory system is, as well as the benefits of the company and how it can be commercialized in this country.

I look forward to the questions.

Merci beaucoup.

The Chair: Thank you, Mr. Casey.

Mr. Dave Conley (Director, Corporate Communications, AquaBounty Technologies, Inc.): Thank you, Mr. Chairman, for inviting me to speak to the committee today on this issue that you're studying, genetically modified animals for human consumption.

I'm the director of communications for AquaBounty. By way of background, I have a Master of Science degree in parasitology from McGill University; a Bachelor of Science degree in agriculture, majoring in renewable resources development, also from McGill; and a diploma in agriculture technology from Kemptville College, which was part of the University of Guelph until it was let go.

I've served as communications adviser to Yves Bastien when he was appointed by a previous Liberal government to be Canada's first and only Commissioner for Aquaculture Development at Fisheries and Oceans Canada. That was from 1999 until 2004.

I joined AquaBounty on July 1, 2013, after working in the aquaculture industry as a senior consultant and a founding partner of the Aquaculture Communications Group, where I worked for nine years. My career in aquaculture began 31 years ago in 1985, while I was a mature student. I was 31 when I went back to university at McGill. I followed the development of AquaBounty almost from its founding in 1991. When I first heard of their fast-growing salmon, I thought it was the most innovative advancement ever in the field of salmon aquaculture, and I still believe that today.

The AquAdvantage salmon is an Atlantic salmon. It has one extra gene added to its almost 40,000 genes. That extra gene is from a chinook salmon, and it produces a growth hormone, the same growth hormone that Atlantic salmon produce. The expression of this gene is controlled by a promoter sequence that acts as an “on” switch. That enables the additional growth hormone gene in the AquAdvantage salmon to function year-round instead of only during the spring and summer, as is the case with other Atlantic salmon. This is a seasonal thing. They basically grow in the spring and summer and they stop growing in the fall and winter.

As a result, AquAdvantage salmon grow to maturity in approximately half the time that Atlantic salmon do. Simply put, AquAdvantage salmon grow faster, but not larger. Consequently, AquAdvantage salmon reach a market weight of four to five kilos in 16 to 20 months versus 30 to 36 months for Atlantic salmon in sea cages.

AquAdvantage salmon are produced from certified disease-free eggs from broodstock in our certified disease-free hatchery in Fortune, Prince Edward Island. Shortly after, the eggs are fertilized with the sperm from AquAdvantage salmon males, and the eggs are subjected to a pressure shock that results in sterile fish from those eggs. All AquAdvantage salmon for the production of food are triploid—three sets of chromosomes—and they're all female, so the fish can't breed with other fish and they can't breed with themselves. We have produced a video on this, and that will be something you can look at later.

We have precautions to prevent escapes. These are all female fish, so they can't mate with each other. They're sterile, so they can't mate and reproduce with wild Atlantic salmon. They're farmed on land in closed containment facilities with multiple and redundant physical barriers to escape. The water is pumped from wells on the property. The fish are not exposed to pathogens, parasites, or contaminants in service waters. Land-based farming facilities are biosecure, with stringent biosecurity protocols. The Fortune, P.E.I., facility is surrounded by a chain-link fence, with a locked steel gate, video cameras, alarms, and staff living on-site. The local RCMP detachment routinely patrols the surrounding area. All management staff are equipped with mobile phones linked to security-alert programs in case of equipment failures or other operational issues.

You met with the regulatory people, and you heard what they had to say last week, so I'm not going to spend a lot of time on that. What I wanted to do was give you some highlights encapsulating 25 years of AquaBounty.

● (1005)

AquAdvantage salmon is the world's first precision-bred animal for human consumption. It was approved by the U.S. Food and Drug Administration on November 19, 2015, after a rigorous review process that began in September 1995. It was approved by Health Canada on May 19, after a thorough review that began in 2011.

Regulatory agency scientists in the U.S. and Canada concluded that the AquAdvantage salmon is the same as Atlantic salmon in every measurable way. It is safe to eat and poses no significant risk to the environment when grown as described in our approval application. AquAdvantage salmon is arguably the most studied food animal, with a research pedigree spanning 27-plus years. They have been conventionally bred for 12 generations, beginning in 1992. The gene construct was inserted in 1989. Since then the fish are reproduced naturally, eggs and sperm, the same as other fish. The genetic engineering was done once. Most people don't appreciate that.

The trait is inheritable, so it just continues. As long as we breed them, they'll continue to be. AquAdvantage salmon are farmed on land-based, recirculating aquaculture systems known as RAS. They recycle 95% to 99% of the water. The suspended solids are filtered out. The nutrient-rich sludge can be spread on farm fields or used by gardeners as a soil amendment. Locating land-based farms close to consumer markets reduces the transportation costs and the carbon footprint of producing these salmon. It produces a fresher seafood product, closer to the consumer.

Containment of AquAdvantage salmon is of paramount importance to AquaBounty, which has taken all the practical, rational, and reasonable precautions to mitigate this risk of escape. There has never been an escape from an AquaBounty facility in more than 25 years of operation. Because AquAdvantage salmon are isolated inside facilities that use treated well water, the fish are not exposed to pathogens, parasites, and contaminants normally found in the environment. Therefore, we don't need vaccines, antibiotics, or chemical treatments for diseases because we don't experience them. In taste tests, AquAdvantage salmon have performed very well when compared to other farmed Atlantic salmon, achieving “most preferred” by people in double-blind taste tests.

AquaBounty is extremely proud of its innovative AquAdvantage salmon, and we look forward to bringing it to the market for consumers to enjoy.

I will respond to some of the other things that have come up in questioning. Given population growth and the limits of the wild-caught fisheries, and the fact that Atlantic salmon are an endangered species, wild fisheries are not going to be able to supply the protein requirements of a growing world population, and aquaculture is going to have to fill that supply-demand gap, which is widening. Food security is an increasing concern for governments everywhere. Innovation to enhance aquaculture production is critical for providing environmentally sustainable protein for future generations.

I wanted to conclude with this: the approval of the AquAdvantage salmon was based on a weight-of-evidence approach, and as a result, both Canada's and the United States' regulatory agencies determined that AquAdvantage salmon is safe and nutritious for humans, the same as conventional Atlantic salmon. Health Canada and the U.S. Food and Drug Administration require labelling for food products, including genetically modified foods, where clear, scientifically established health risks or significant changes to the nutritional qualities of the food have been identified and can be mitigated through labelling. For example, an allergen present in food must be labelled to alert consumers. An example is peanuts. In this case, given that no health and safety concerns were identified, there is no special labelling requirements for our salmon.

I will finish with one thing that people are probably not aware of. AquAdvantage salmon was developed by Canadian scientists at a Canadian university, Memorial University in St. John's, Newfoundland, using the latest scientific knowledge of the time, in the 1980s. The fish was developed in 1989, and they did this to try to resolve a production problem that was affecting Atlantic Canada salmon farmers. The issue was superchill. This was when the temperature of the water dropped below the freezing point of salmon blood, and those fish in the net pens were instantly killed.

● (1010)

The original research was funded by the Canadian government to develop a way to protect those salmon from that problem. The development of the AquAdvantage salmon was the next thing.

The Chair: Thank you, Mr. Conley.

[*Translation*]

The presentations are over.

I will give six-minute turns.

We'll start with Mr. Anderson.

[*English*]

Mr. Anderson, you have six minutes.

Mr. David Anderson (Cypress Hills—Grasslands, CPC): Thank you, Mr. Chair, and thank you, gentlemen, for being here today.

We've talked a bit this morning about obligatory or mandatory GMO labelling. This would be a move towards regulation for traits rather than for health and safety. I'd like to get both of your opinions on that. Is that necessary? We had the debate in the House a number of times. We voted on this bill, and I know I voted consistently on this issue.

Do we need to start labelling for traits, or is it adequate to be labelling for health and safety?

Mr. Andrew Casey: Mandatory labelling is obviously a very topical discussion.

There are a couple of pieces to this issue. One is that labelling can be done at any point in time. In fact, I looked at a bag of pretzels on my countertop the other day and it says, “Contains no genetically modified organisms”. If you look at the organic movement, you notice that we didn't label for non-organic food; instead, we allowed the organic movement to put on labels saying it's organic. That, I think, is the better way to go, because we know of no scientific evidence to show that GMOs are causing any harm. I would advocate that we keep labels reserved products that we know will harm you: tobacco, peanuts, alcohol. We know there is scientific evidence that shows that those types of products can harm you, and we should reserve the labelling for that. Otherwise, we get to a place where products start to look like NASCAR cars with stickers all over them, making it very hard for you to discern exactly what you're supposed to be worried about and what you should really pay attention to. There's probably a market discipline that needs to come into play that would allow for labelling to take place.

The other challenge with labelling is less about the cost—although we've heard that argument thrown around—and more about how you regulate it once you've put a label on it. It's very easy to say it contains nothing, but how do you scientifically demonstrate that there is no trace of GMOs in a product, as you could do with peanuts? In the peanut world, you see “may contain trace elements of peanuts” or it has absolutely no peanuts.

When I used to work for the forest products industry, it had a similar challenge. It's very easy when you have a piece of lumber that comes out of a tree. You could stamp it and say that it came from this forest and that it was certified to this level. When you get into the pulp world, where you're combining chips from a number of different sources to make the pulp that makes the paper, it's very hard to make sure that all of your upstream sources are certified to the same level.

In the food world, I think it would be the same problem. You could probably certify that steak came from a cow that came from a producer. When you get into things like chips and cereals, though, that involve a number of different sources, it would be very difficult to have any certainty that you could actually put a label on that.

● (1015)

Mr. Dave Conley: We don't believe that labelling really adds anything. The experts who have reviewed our salmon have found that it's equivalent in every way to an Atlantic salmon. Why would you label something that's exactly the same?

Mr. David Anderson: Just as a matter of interest, where else is the salmon approval taking place? Are you seeking approval anywhere else? You have it in Canada and in the United States. Are you looking for—

Mr. Dave Conley: Other markets? Yes. We have trials now in Argentina and in Brazil.

Mr. David Anderson: How does our approval regulatory process compare to some of these other countries? Andrew talked about it. He obviously felt that our regulatory system is strong right now. He was talking about how solid it is. Do you think that it's timely and predictable? We were told this morning that it's not transparent. Do you think it's transparent?

Mr. Dave Conley: I think the Canadian system is far superior to what we experienced in the United States.

Mr. David Anderson: In what areas?

Mr. Dave Conley: It's a very rational package. You submit all of your data at once, and you're going to get a response within a certain period of time. With the United States, it's more phased in, so it takes a little bit longer. In our case, we were the first to go through the process. We didn't really have a process, so a lot of time was consumed just figuring out what the data package was going to be. Our first data was only submitted in 2004.

Mr. David Anderson: I don't know if you can answer this question, because you haven't worked in the other areas, but what particular challenges do you think approval for genetically modified animals faces that are not faced by some of the plant products? Is there a difference or not?

Mr. Dave Conley: In my mind, no. The genetics are the same.

I think that with animals we don't have the same problems. We don't have wind pollination. We don't have to worry about these outside things. Plants would be in a field. They're out in the open environment. Ours are contained. They're basically going to be contained all their lives. The only time they come out of the facility is when they're harvested.

Mr. David Anderson: Does either of you have any suggestions for marketing approaches that either the industry or the government should be considering in terms of going towards the commercialization of these products? Social licence is a big issue in a number of other areas. Do you have any suggestions on what types of approaches we should be taking in terms of marketing in order to convince the public that these products are safe and are a good choice for them to be eating?

The Chair: Answer quickly, please. We have five seconds.

Mr. Andrew Casey: The role of the government, in the industry's view, would be regulatory. Make sure that the regulatory science is as rigorous as possible. The other parts of it will be dealt with by the marketplace. Investors are the primary decision-makers as to whether or not a product will be commercialized. If you're not able to prove that there's going to be a marketplace for it, investors will not invest.

Investors do require that there be a proper regulatory process in place and that intellectual property be treated in a competitive way as well. Those types of hosting conditions that government is responsible for are probably paramount. That will drive investment, and then that will allow for the commercialization to take place.

● (1020)

The Chair: Thank you, Mr. Casey and Mr. Anderson.

Ms. Lockhart, you have six minutes.

Mrs. Alaina Lockhart (Fundy Royal, Lib.): Thank you, gentlemen, for your presentations today. I think they were both very interesting and helpful.

AquaBounty is an American company, correct? Is it based in the U.S.?

Mr. Dave Conley: Yes. Our head office is based in Maynard, Massachusetts.

Mrs. Alaina Lockhart: Can I ask why the company chose to carry out the egg production facility in Prince Edward Island?

Mr. Dave Conley: As you know, the technology was developed in St. John's, Newfoundland. At the university, the research facilities are small. When we went looking for a facility, the one that met the criteria was the particular one that we purchased in Fortune. It was just a matter of how, when you go looking for property, you have to take where the location is.

Mrs. Alaina Lockhart: All right.

How about technology, in terms of the resources on the ground in Prince Edward Island? We're talking about technology clusters and that sort of thing. Is there a particular cluster in Prince Edward Island that's attractive to the company as well?

Mr. Dave Conley: Well, obviously, the Atlantic Veterinary College and the University of Prince Edward Island have been useful. There are other players in the biotech cluster in Prince Edward Island that I think have been useful.

Mrs. Alaina Lockhart: Mr. Casey, did you have anything to add to that?

Mr. Andrew Casey: It's a great question. The industry across the country is found in clusters in every single province in every single region.

P.E.I. is an anomaly. On a per capita basis, they're more productive from an innovation standpoint in supporting the industry than the U. S. is. They have a remarkable cluster. It's built around the university, but the governments have also been very supportive of the industry in making sure that it's healthy and vibrant in the province. That's attracting more innovation and more science.

It's one of those self-perpetuating circles—a virtuous circle, in many respects—that continues on. It will attract more companies, more growth, and more innovation. As you heard in their case, the original path for the AquaBounty fish was not what it ended up being. That's quite often the case for most innovation. The path that you set out on is often not where you end up going; it's discovery along that path that takes you on different tangents. That can spin off into different companies and different innovations. That's why these healthy clusters are so important to the nation writ large.

Mrs. Alaina Lockhart: Now, having said that, as I understand it, after the eggs get to a certain point in Prince Edward Island, they're shipped to Panama. What is it about the Panama facility that makes it the right spot to do that part?

Mr. Dave Conley: Again, that was a serendipitous thing. One of the principals in the company at the time had a friend in Panama. It was cheaper to acquire the facility, or to at least lease the facility for R and D, than it would have been to build a brand new facility from scratch in either Canada or the United States.

The advantage of Panama also is its geographic isolation and the fact that there is no indigenous Atlantic salmon population. The waters in that area are basically a biological barrier, just through lethal water temperature.

Mrs. Alaina Lockhart: I think that is important to know. I'm from the Atlantic coast, and there are concerns there about the indigenous population there, so I think that's a good point to mention as well.

As I understand it—and please correct me if I'm wrong—AquaBounty's plan originally was to use more of a traditional aquaculture approach for farming salmon, and it has moved to a land-based facility. Is that correct?

Mr. Dave Conley: The original problem was superchill. That would have been in an ocean-based facility.

When the research developed the AquAdvantage salmon, it dawned on everyone quite quickly that escape was going to be a major concern. That's why the company invested in the technologies of using only female sterile fish in a land-based facility, because the whole idea of land-based is that now you've isolated and contained your fish, so they're not going anywhere. In fact, AquaBounty has been asked to speak at conferences on biosecurity because we are an acknowledged leader in this area.

● (1025)

Mrs. Alaina Lockhart: I would also assume that from your perspective you have much more control over the inputs. I think you mentioned some of those. We know in traditional aquaculture there have been issues with sea lice and other parasites and things like that. Are those things that you can limit in a land-bound facility?

Mr. Dave Conley: Absolutely. We can optimize a growing environment for the fish. In fact, we can control all of the growing parameters to optimize their growth.

We don't have sea lice problems. We don't have ISA. Most of the stuff that's plaguing the industry in the oceans is not a concern for us.

Mrs. Alaina Lockhart: From a cost perspective, is there any reason the company would ever want to move from a land-based facility?

Mr. Dave Conley: No.

Mrs. Alaina Lockhart: Thank you.

Mr. Dave Conley: I think the strategy is to locate close to the consumer market. That's the real benefit of being land-based: now you can grow a farm anywhere.

Mrs. Alaina Lockhart: I think that kind of leads to the next question, which is how you promote the product, because we have heard issues from consumers, but my time is nearly up.

Thank you.

The Chair: Thank you.

[*Translation*]

Ms. Brosseau, you have six minutes.

Ms. Ruth Ellen Brosseau: Thank you, Mr. Chair

[*English*]

I would like to thank our witnesses for their presentations this morning on this important topic.

I understand these fish are female. What process is used to cause infertility, and is it 100% effective?

Mr. Dave Conley: Do you mean for sterilization?

Ms. Ruth Ellen Brosseau: Yes, I mean for sterilization. What process is used to make sure these salmon are infertile, and is it 100% effective?

Mr. Dave Conley: The process is called a pressure shocking treatment. Once they're fertilized, within a certain period of time they're put into a cylinder and they are exposed to a pressure of so many pounds per square inch. Without getting technical, that allows the three sets of chromosomes to be retained. Normally you would have two, and that third set basically renders them sterile. They can't breed.

On the efficacy of that, each batch is tested and we routinely receive 100% on those. In the data that we submitted to the FDA, we achieved 99.8% as an average. The FDA in its approvals said that we would only have to obtain 95%, but the company wasn't satisfied with that because we realized this was going to be an issue, so we've readily gone beyond that. In fact, new technology has been developed, and it's been discussed at the meetings in Norway recently. Basically we're looking at a vaccine development that would guarantee 100%.

[*Translation*]

Ms. Ruth Ellen Brosseau: Did Health Canada conduct its own scientific research on your products or did the department rely solely on the analyses and results you provided to them?

[*English*]

Mr. Dave Conley: We submitted our data, but Health Canada also had an independent panel of experts that was administered through Environment Canada and Fisheries and Oceans Canada. They looked at the aspects of safety and risk to the environment.

Ms. Ruth Ellen Brosseau: I'm sure you're well aware that there are quite a few retailers in the States that are concerned about GMO salmon. Some of them have made commitments not to sell your product. What do you think of these commitments not to sell your product? Is this happening in Canada? Do you have retailers committing not to sell your product?

Mr. Dave Conley: The answer to that is that this is a campaign to sign up retailers. When there's no product on the market, there's no advantage to not going along. When there is a product on the market, we expect we'll see a different outcome.

Ms. Ruth Ellen Brosseau: Are there any businesses in Canada, any retailers in Canada, that have said no?

Mr. Dave Conley: Do you mean that have come to us and said no? No.

Ms. Ruth Ellen Brosseau: Okay.

What role does the government need to play?

Earlier we talked a lot about making sure that consumers have confidence in products. In the case of grains and seeds, we've been growing soybeans, canola, and other products for over 20 years. What role does the government need to play to counter the campaigns that we may see online and make sure we are providing Canadians with responsible and adequate information when it comes to making decisions when they buy products?

● (1030)

Mr. Dave Conley: That's for you.

Mr. Andrew Casey: It's similar to Mr. Anderson's question, and it's a good one: can the government play a bigger role? I think, as in to my previous answer, that we need to ensure that the regulatory system is as competitive as possible.

These advancements, these innovations, are taking place at such a rapid rate and they're in such unique spaces that you have to keep up with that pace, and it's very difficult at times. There's no question about that, so we have to make sure not only that our existing set of scientists in the four departments in Canada are up to speed on the technology but also that our university system is prepared for that as well, because that's where we're getting most of our scientists who come into those departments and who will become the future regulators. That would be another important role governments could play.

The marketplace is going to essentially regulate itself. You're going to get to a point where these products are going to sell themselves based on their virtues. Right now, I think when you put GMO on it, there is obviously some baggage associated with those letters. There are other words that could be used to replace that. “Precision engineering” might be another term that could be used.

The benefits will outweigh also what is basically a negative image, and the benefits are real. In the case of AquaBounty, for example, you've heard about the benefits: you're able to grow them close to the marketplace, you require fewer nutrients, you can grow them faster, and you can get them to the marketplace fresher. There are benefits to the markets that you're in, but you can also now bring that fish to other markets that couldn't normally have fish as a protein.

Ms. Ruth Ellen Brosseau: Have you done a market analysis to see if the Canadian consumer is willing to buy or is looking forward to buying salmon? Have research and polling been done on that?

When you go to a supermarket and it's not labelled, you kind of don't know what you're buying, but if it is labelled, maybe Canadians would be a little bit more hesitant. Have you done a market analysis to see if Canadians are willing to buy your products? If so, can we see it?

The Chair: Could we have a very quick answer? We're just about out of time.

Mr. Andrew Casey: That raises a question that was raised earlier about polls. It's a dangerous place to go when you start to do regulatory policy based on polling. I think polling can help to shape and to understand where people's concerns are, but at the end of the day, what you need to address that concern is to get more information into the hands of the consumers, and that's what the companies are going to do.

I think the benefits greatly outweigh any perceived risk or any risk that might have been thought of that may be coming down the line. We know what the benefits are right now.

The Chair: Thank you, Mr. Casey.

[*Translation*]

Mr. Drouin, you have six minutes.

[*English*]

Mr. Francis Drouin: Thank you, Mr. Chair.

Thank you to Mr. Casey and Mr. Conley for appearing before this committee. We certainly appreciate it as we conduct our study on GMO.

Mr. Casey, you touched on a point with Mr. Anderson, I believe. You mentioned an overload of information with regard to labelling and you said that you don't want our products to look like a NASCAR car.

I want to touch on what Ms. Brosseau mentioned. One of the biggest factors behind consumer decision-making is preference. Do you believe the industry should play a role in ensuring that GMO products are safe? What do you see as being the role of industry versus the role of government in doing that?

Mr. Andrew Casey: Certainly it's bad business to produce unsafe products. You're not going to be around very long if that's what you're doing. That's paramount.

You heard about the 20-year experience with the AquaBounty fish, and all the other companies are the same. They take a long time to bring that innovation to the marketplace. It goes through safety and efficacy tests internally, but then it has to go through a number of regulators, and you have to recall that most of the marketplaces for these innovations are not Canada. Canada represents a very small percentage of the global marketplace. You're producing these for a global marketplace, and so you have to go through a number of other regulators, predominantly in the U.S. but obviously in Europe as well, that also have their own processes and standards in place. That is a huge part of it, and I think that is where the industry absolutely has to make sure the product is as effective and as safe as possible before it gets to market, to make sure that everybody feels comfortable and knows that those products are safe to consume.

Mr. Francis Drouin: You have also touched on another point. How can Canada ensure we keep that conversation on an international basis and keep that conversation science based? Do you see a bigger role that CFI should play to ensure that when companies develop products that are safe for consumption, other countries continue to base that conversation on science?

Do you see a role, and how can we improve that role?

● (1035)

Mr. Andrew Casey: Absolutely, because it's for a global population, and Canada is known around the world as having a solid regulatory system in place. It's one of the best in the world, and keeping that system ahead of the other countries is very important. It's a global marketplace, it's globally competitive, and we have to understand that we can create a little bubble for Canada and hope this stuff doesn't happen, but that's not the reality. We're out there. We're trying to address global challenges, and these are solutions for those challenges.

Canada has a unique position to be very competitive in that space, but a huge part of the success of the companies here is our regulatory system.

Mr. Francis Drouin: Mr. Conley, can you talk to me about the process that AquaBounty Technologies went through to ensure the salmon would be safe for human consumption?

Mr. Dave Conley: I don't have that offhand. That was in the science studies provided and that was before my time, but I can get that for you if you want it.

Mr. Francis Drouin: You can provide that information to the committee?

Mr. Dave Conley: Yes. I'll see what was in the package and I can provide that, I think.

Mr. Francis Drouin: Thanks.

I want to touch again on the role of government. What we have heard from the previous witnesses is that the government should be doing an assessment for economic impact before any GM product is approved for release. I think, Mr. Casey, you have touched on government playing only a regulatory role on health and safety.

Do you agree with that statement?

Mr. Andrew Casey: No. The marketplace will dictate whether there is an economic value. Why would you produce something that is not going to be sold? I think it's counterintuitive that you would spend millions of dollars in research and development to put something out there and hope the world wants it. By the time you have put it out there, you have done it, but you have done it not on your own. Usually, if not in all cases, you found global investors to invest in your company and your innovation. They are confident the science is rigorous and it's going to amount to innovation.

There are risks that you will fail. There's no question about that, but by the time you have commercialized it and put it out into the marketplace, you have proven its safety and efficacy. Now you're getting into the place where you can sell it.

If somebody had walked into a boardroom that I was sitting in with the idea for Pokémon GO, I would have told them to get out—it's never going to work, it's crazy, and I wouldn't spend a dime on it—yet here we are. Whatever it took to develop that, maybe $20 million and six months, it resulted in something my 10-year-old can't take out of his hands. I can't predict that, and it shouldn't be the government's role to try to predict what will work in the marketplace. You have to let the global marketplace figure that out.

Mr. Francis Drouin: I agree with that statement.

How much time do I have left?

[*Translation*]

The Chair: You have 45 seconds left.

[*English*]

Mr. Francis Drouin: We have the science right, but how do you think government can play a role in ensuring that we can market that science properly to ensure that consumers have confidence in GMO products? There is a small sector of the population that is worried about that, but we need to ensure that they do have confidence in the product. How can the Government of Canada play that role, if they should play that role?

Mr. Andrew Casey: The question's been asked about three times now. If what you're advocating is a government spend for a massive campaign to support the industry, I fully support it, because I think there's a lot to boast about.

We have a phenomenal amount of innovation coming out of this country. It's being done in a scientific and rigorous way. It stands to reap enormous economic benefits for this country. Canola is one example, and there are many others. Some of the examples I cited that are coming to the marketplace are extremely exciting, and they will generate massive amounts of economic benefit to the regions from which those innovations come.

The Chair: Thank you, Mr. Casey. We're out of time.

We might have one quick question for the second round from each member. I say “quick” because we have about five minutes.

If everybody's okay with that, we'll go through the round. There are three people to speak, so just a quick-fire question. Are we good for that?

We will start with Mr. Longfield for the first one.

Mr. Lloyd Longfield: I was hoping you weren't going to do that.

Voices: Oh, oh!

The Chair: We can shift it around.

Mr. Lloyd Longfield: No, that's fine.

Canada wants to be the leader in food in the world. Perhaps you could tell us how important a role genetics might play in our becoming the leader in the world.

● (1040)

Mr. Andrew Casey: Our history of innovation, particularly in the genetics space, is well known. It's generating phenomenally exciting solutions for global challenges.

We're well positioned. We have a great university system. We have great scientists. We have a history of doing this. We have a fantastic regulatory system, as I alluded to. Why not take advantage of that? Investors have a sense of that as well. A number of other factors will go into deciding whether or not something is commercially viable, but actually getting that out there and selling it will bring back enormous economic value.

There's a reason that all these other nations are running very quickly to set up biotechnology blueprints to support their domestic industries. It's because they all recognize the enormous economic value to their countries and to their populations of bringing those innovations to their own populations.

The Chair: Mr. Shipley is next.

Mr. Bev Shipley: It was a Canadian product, Mr. Conley, and Canadian university development. You mentioned filling the protein gap. Just quickly, what advantage is the AquAdvantage salmon to the consumer, and how will you do that for not only domestic but also international markets?

Mr. Dave Conley: I think the advantage of this technology to the consumer is that it can bring more fish to market quicker. In standard genetics, to quote a Norwegian genetics scientist, to double the growth rate of an Atlantic salmon takes approximately six generations of four years. That's 24 years. AquAdvantage did it in two. That's a tremendous improvement over our ability to rapidly produce food in a world that is becoming highly unpredictable due to global warming and climate change.

In terms of the application of the technology to meet those demands, the market will demand food, and the fastest way we can produce it, I think, is the way we want to go.

The Chair: Thank you. That will complete our questioning.

Mr. Casey and Mr. Conley, thank you for appearing. It was very informative, as were your different views on the subject.

That will conclude our session. When the committee meets on Thursday, the first 45 minutes will be subcommittee. Following that, the main committee will meet, and we'll have one hour of APF witnesses.

Is that okay? We're all good?

Thank you. The meeting is adjourned.