

STRENGTHENING
ATLANTIC CANADA

ACFFA 2013

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acffa

Atlantic Canada
Fish Farmers Association

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MESSAGE FROM THE EXECUTIVE DIRECTOR

Norway is not about to let this unprecedented opportunity pass. Neither is Scotland.

Canada? We're not so sure. But we hope not.

Here's what we do know: the amount of food that will be consumed in the world in the next 50 years will exceed all the food eaten in the rest of human history. Global production of seafood is rising rapidly at a pace of seven to nine per cent each year. One in five persons worldwide relies on fish for their primary source of protein. Each year there are 75 million more people to feed around the world. Salmon has now surpassed beef in world-wide consumption.

It's easy to see that aquaculture is crucial for supplying the world's food needs. And no region in the world is better poised than Atlantic Canada to reap the benefits of aquaculture's potential and transform and revitalize its rural, coastal communities.

[In 2013, the Atlantic Canada Fish Farmers Association made it a priority to look to other global aquaculture leaders to help our region continue to grow our industry here at home.](#)

Our association initiated, organized and led an Atlantic Aquaculture Mission to Norway and Scotland from August 8-16, 2013. Both these countries have bold visions and solid plans to sustainably grow their salmon farming industries to help meet the world's growing demand for healthy protein.

Norway's goal is to produce 2.7 million tonnes of salmon and trout – enough to feed 100 million people by 2025. That production translates to 56,000 full-time equivalent jobs and a \$62 billion contribution to the country's GDP. That's enough to finance about 65 per cent of the country's nursing homes or meet 60 per cent of the demand for kindergarten spaces. Scotland – a country viewed by many as having a similar production capacity to Atlantic Canada – has increased its salmon production from 14 tonnes in 1971 to 154,164 tonnes in 2010. Scotland plans to increase its salmon production to 220,000 tonnes by 2020....or as they call it "220 by 2020."



While other countries around the world have seen their aquaculture industries consistently grow over six per cent annually, Canada's aquaculture growth has flat-lined over the past decade. One of the reasons for this is Canada's lack of vision for its aquaculture industry. In fact, Canada's aquaculture industry is governed in large part by the Fisheries Act, which doesn't even mention the word 'aquaculture'. The regulatory framework for our industry is complex, confusing and uncertain. Federal and provincial regulations overlap and are filled with duplication. Ultimately, the lack of vision and inefficient regulatory framework drives away investment and discourages innovation.

Although both New Brunswick and Nova Scotia have aquaculture growth strategies, our region's fish farmers continue to face significant challenges due to the lack of a national vision and these confusing regulatory frameworks. Cutbacks affecting fish health research at both the federal and provincial levels and a lack of treatment options for sea lice that are available in other jurisdictions are other barriers.

As this report details, our advocacy work continues in support of enabling, science-based regulation and policy for sustainable aquaculture development in Canada and specifically, Atlantic Canada. This report also showcases the fact that, in spite of our challenges, our salmon farmers remain committed to environmental sustainability, a focus on fish health, innovative research and development and significant involvement in their communities.

Our region is facing record debt, skyrocketing health care costs, an aging population and high unemployment. Salmon farming represents an unprecedented opportunity to bring economic prosperity to Atlantic Canada's rural communities – while producing one of the world's healthiest foods.

The rest of the world is grasping this opportunity. We can too. All we have to do is work together to make it happen.

PAMELA PARKER
Executive Director



WHO WE ARE

The Atlantic Canada Fish Farmers Association (ACFFA) is an industry-funded association working on behalf of the salmon farming industry in New Brunswick and Nova Scotia. The ACFFA represents salmon producers in addition to a wide range of supporting companies and organizations. Salmon farming employs over 3000 people in our region and generates over \$330 million to our provincial economies.

OUR VISION

Atlantic Canada's finfish aquaculture industry will continue to be an innovative, competitive economic sector that is a recognized world leader in sustainable finfish production.

OUR MISSION

To provide value to our members by taking a leadership role in the development and implementation of strategies that are focused on fish health and welfare, environmental stewardship, innovation and social responsibility within our communities.

ASSOCIATION GOALS

- Assure the ongoing improvement and implementation of fish health initiatives that support the production of safe, high-quality farmed finfish
- Build effective structures and relationships that result in a single voice for the finfish aquaculture industry in Atlantic Canada
- Facilitate the development and awareness of training and education programs that support increased career opportunities, especially in rural and coastal communities in Atlantic Canada
- Collaborate with all levels of government in developing sound regulatory frameworks and effective support structures and relationships
- Support scientific research and technological development that is industry-driven and ensures the ongoing sustainability of an innovative Atlantic aquaculture industry
- Continue to respect the environment in which our members operate and work with other stakeholders to enhance environmental stewardship
- Ensure a secure business climate that provides the infrastructure necessary to support growth in the Atlantic Canadian farmed finfish sector
- Build and maintain positive relationships with local communities, other marine resource users and conservation organizations
- Forge a positive image for Atlantic finfish aquaculture through regional, national and international initiatives
- Manage the Association ensuring it remains a strong, representative organization providing value to its members

OUR ASSOCIATION

2013 ACFFA BOARD OF DIRECTORS
Our board of directors is representative of our membership.

LARRY INGALLS (CHAIR)

Northern Harvest Sea Farms

NELL HALSE (VICE CHAIR)

Cooke Aquaculture Inc.

BOB SWEENEY (SECRETARY/TREASURER)

Sweeney International Marine Corp

BEV BACON

RDI Strategies

MORTON BENSON

Benson Aquaculture

CLARENCE BLANCHARD

Future Nets and Supplies

ALLISON MACKINNON

Novartis Animal Health Canada

TREVOR W. STANLEY

Skretting North America

LEN STEWART

Aqua Fish Farms

TOM TAYLOR

Northeast Nutrition Inc.

ACFFA MEMBERS

Our members are leaders in environmental stewardship and part of the social fabric of their communities. They adhere to rigorous, science-based environmental performance standards that are among the most stringent in the world.

Salmon Producer Members

Aqua Fish Farms Ltd.
Benson Aquaculture
Cooke Aquaculture Inc.
Northern Harvest Sea Farms
Seal Cove Salmon

Feed Company Members

Northeast Nutrition
Skretting

Associate Members

Aqua Pharma Inc.
Atlantic Veterinary College
Brittney Hill Farms
Dominator Marine Services
Don Atkinson Trucking
Downeast Plastics Ltd.
Four Links Marketing
Future Nets & Supplies
Huntsman Marine Science Center
Intrinsic Environmental Sciences Inc.
Marsh Canada Ltd.
Mitchell McConnell Insurance Ltd.
New Brunswick Community College
Novartis Animal Health Canada Inc.
RDI Strategies Ltd.
Rogers Consulting Inc.
Research and Productivity Council (RPC)
Silk Stevens Ltd.
Sweeney International Marine Corp.

ACFFA STAFF

The ACFFA is staffed by a dedicated team of full-time, part-time and contract individuals.

Pamela Parker Executive Director
Sybil Smith Director of Operations
Doni McGee Executive Assistant
Betty House Research and Development Coordinator
Murray Hill Nova Scotia Regional Manager
Kathy Kaufield Communications Manager
Jim Hanley Wharf Manager



STRENGTHENING ATLANTIC CANADA

Here is what Mr. Arni Mathiesen, Assistant Director General at the Food and Agriculture Organization of the United Nations (Fisheries and Aquaculture), told delegates at AquaNor 2013:

- 1 billion people in the world are starving
- 1 billion people are malnourished
- 1 billion people are obese

Aquaculture is crucial for supplying the world's food needs and for keeping the population healthy. Atlantic Canada can play a vital role in realizing aquaculture's incredible potential.

Our region's abundant natural ocean environment makes it one of the best places in the world to farm fish, especially Atlantic salmon. Over the past 34 years, our fish farmers have built a locally-based, globally competitive, sustainable aquaculture industry that has, and will continue to, bring prosperity to our region, especially our coastal communities.

Atlantic salmon is by far the most important finfish species grown by our fish farmers, but many companies are now expanding to include other species such as trout and arctic char as well as mussels and seaweed from integrated multi-trophic aquaculture farms.

BRINGING PROSPERITY TO OUR REGION

- Salmon farming employs over 3000 people in our region and generates over \$330 million to our provincial economies.
- Over 90 per cent of the jobs in the salmon farming industry are full-time. Seven per cent are part-time; only three per cent are seasonal.
- Farmed salmon is New Brunswick's biggest agriculture-based export and has the same potential in Nova Scotia.
- Our region produces over 30 per cent of Canada's farmed salmon.
- Our industry includes ocean farms, processing plants, and hatcheries, feed plants, cage and equipment manufacturers, research facilities, and a range of service and supply companies including diving, engineering, maintenance and transportation.



DID YOU KNOW?



Eating Omega-3 rich seafood like salmon can reduce the risk of coronary death by 36 per cent and increase life expectancy by 2.2 years.

12,240 lives could be saved each year in Canada if our population ate more Omega-3 rich seafood like farmed salmon.

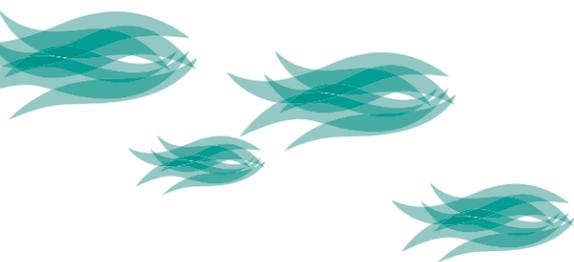
Saving those 12,240 lives would reap an estimated \$8.5 billion per year in benefits – not including the billions of dollars in saved health care costs.



PART OF OUR COMMUNITIES

WORLD-CLASS SALMON. LOCAL COMMITMENT.

Atlantic Canada's salmon farmers love the communities where they work and raise their families and are proud to help contribute to their growth and well-being.



In 2013 – in addition to a wide range of activities our members participate in - the ACFFA contributed to our communities in a variety of ways:

- Volunteering on the organizing committee for Bay of Fundy Seafood Week
- Hosting complimentary salmon farm tours as part of Bay of Fundy Seafood Week and Open Farm Day
- Continuing to operate the Limekiln Service Centre for the benefit of our industry, government, local fishers and recreational users
- Providing tourism and community information within our farming regions

The ACFFA also supports the following local initiatives:

- Atlantic Lobster Sustainability Foundation Science Workshop
- Atlantic Salmon Advisory Committee
- Citizens for Sustainable Aquaculture, Shelburne, NS
- Inner Bay of Fundy Salmon Recovery Team
- Musquash Advisory Committee
- Nova Scotia Salmon Association
- St. George River Mosaic Project
- Nova Scotia Regulatory Review Community Meetings
- Nova Scotia Regulatory Review Roundtable
- Saint John River Management Advisory Committee



FROM OUR HEARTS TO YOURS

We've all been touched by heart disease and stroke.

In 2013, the ACFFA and its members increased their efforts to raise awareness and support research into heart disease and stroke.

The ACFFA raised \$2,600.00 for the Heart and Stroke Foundation through its Five Easy Pieces Challenge and a new event called Art for Heart.

Our 2nd Annual Five Easy Pieces Challenge saw each ACFFA staffer wear just five pieces of clothing for the entire month of April. Sure, they could choose different shoes, jewellery or ties to spice things up – but think about it – five pieces for one whole month! Yes, they did a lot of laundry!

The Five Easy Pieces Challenge was created by our friends at the BC Salmon Farmers Association who invited us to take up this challenge with them in 2012 and help spread heart-healthy messages from coast to coast. The ACFFA staff raised funds largely through pledges as well as through a variety of activities we host – like collecting donations from those taking our tours during Open Farm Days and Bay of Fundy Seafood Week and raffles at industry events.



ART FOR HEART

This year we launched a new initiative – Art for Heart. Charlotte County artists Geoff Slater, Theresa MacKnight and Adam Jeffrey created paintings that were auctioned off during the Bay of Fundy Seafood Week's Gala Chef's Dinner. Guests at the dinner got the opportunity to watch the artists create their works and then bid on the finished pieces. They created some fabulous art for a terrific cause. Charlotte-The Isles MLA Rick Doucet served as auctioneer.

Atlantic salmon is one of the most nutritious foods you can eat. It's one of the world's best sources of heart-healthy omega-3 fatty acids. It's also high in protein, low in saturated fat and loaded with vitamin D and E.

We intend to grow these worthy initiatives in the coming year.



GROWING OUR FISH WITH CARE

Atlantic fish farmers follow the highest fish health management standards and are dedicated to producing high quality and nutritious food.

INTEGRATED PEST MANAGEMENT PLAN

Avoiding sea lice treatments is the top priority of Atlantic salmon farmers who have developed management practises to reduce the likelihood of high concentrations of sea lice.

Sea lice are naturally occurring parasites that affect wild and farmed fish alike. They do not pose a risk to human health, but too many sea lice can stress salmon, making them vulnerable to disease. Their concentration varies from place to place. For example, no sea lice treatments on salmon farms have been necessary in Nova Scotia for over 20 years.

Farmers begin to control sea lice by: selecting farm sites with good water circulation; reducing stocking density on the farms; following production sites; and, ensuring only salmon born in a single year are present at each farm site which prevents older farmed salmon already exposed to the parasite from transferring it to incoming smolts. While these management procedures, along with cold winter temperatures, greatly reduce the incidence of sea lice, outbreaks may still occur and sometimes our fish need to be treated by a veterinarian.

The ACFFA has focused significant resources on gaining support for a science-based Integrated Pest Management Plan (IPMP) for sea lice in the Bay of Fundy.

An IPMP combines farm management practises with stable access to a variety of approved treatments that veterinarians can use strategically to target various life stages of sea lice while considering environmental constraints such as water temperatures. This approach allows farmers to use the right product at the right time, thus reducing the overall amount of treatment used while keeping lice numbers at an acceptable low level.

To date, our efforts to make real and lasting progress on a fully operational IPMP have met with limited success. Fundamental to an effective IPMP are regulatory approvals for a full suite of treatment options and timely authorizations to evaluate efficacy. For example, Canadian fish farmers do not have access to feed formulations that are available in other jurisdictions – despite the fact that salmon being fed these alternative ingredients are allowed to be imported into our country.

The ACFFA and New Brunswick Department of Agriculture Aquaculture and Fisheries work together to update the regulations that support fish health and sea lice management. We continue to work together to increase collaboration towards a fully functional sea lice IPMP. We are coordinating and/or working together on R&D activity.

Realizing that the public has questions about sea lice management, we provide traditional fishing organizations with an overview of our annual coordinated treatment plan and the ACFFA issues notifications in advance of any sea lice bath treatment. The ACFFA also issues an annual Sea Lice Management Report that summarizes the status of sea lice populations and treatments during the past year.

OTHER FISH HEALTH ACTIVITIES

Since 1996 when ISA was identified in New Brunswick, salmon farmers have worked with scientists, veterinarians and government to manage and prevent outbreaks. Atlantic salmon farmers work with biologists, oceanographic specialists and private and government veterinarians and regulators for advice and oversight on their everyday farming practices.

Our farmers know that ISA is a serious threat to the health of their fish, so rigorous testing and monitoring are in place. These protocols helped to ensure that no ISA occurrence affected the Maritime region in 2013.

However, in May the ACFFA coordinated a workshop that brought together industry, government and fish health professionals to review and update emergency response plans and standard operating procedures to support viral management.

On a national level, the ACFFA is working towards the development of a Minor Use, Minor Species (MUMS) program to support research and registrations for fish health medicines in Canada. Minor Use are medicines for diseases that occur infrequently or in limited geographic areas and in a small number of animals annually. Minor species are all animals other than humans that are not one of the major species – examples include honey bees, fish, sheep and goats. All salmon enter the marine environment certified disease free; less than three per cent of feed given to farmed salmon contains an antibiotic; however, it is important that veterinarians have options available to protect their fish if the need arises.





SUSTAINABILITY AND INNOVATION

Atlantic Canada's fish farmers are committed to building the most responsible and sustainable aquaculture industry in the world. We care about the marine environment in which we live and work. If we are not cautious stewards of our environment, then we can't farm, our neighbours can't fish, and the ocean we love won't be here in its present form for our children and grandchildren.

We support scientific research and technological development that is industry-driven and ensures the on-going sustainability of an innovative Atlantic aquaculture sector.

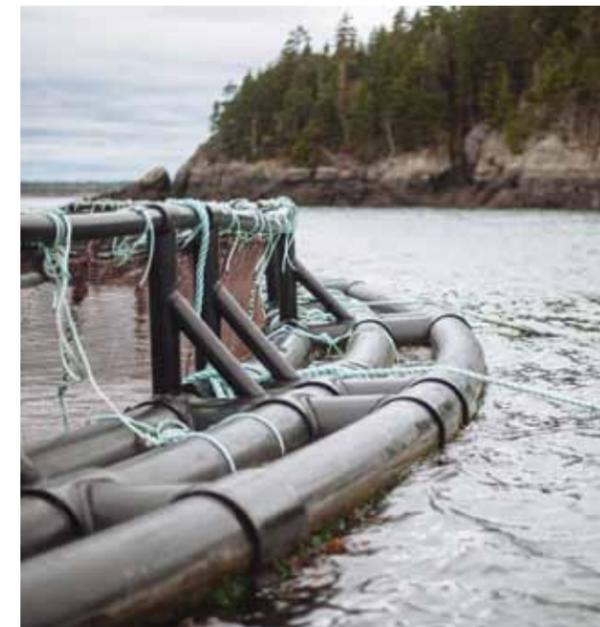
A PERFORMANCE-BASED SYSTEM FOR ENVIRONMENTAL MANAGEMENT OF FRESHWATER SALMON AQUACULTURE

Working with industry and regulators, the ACFFA coordinated the development of a Code of Practice to Support Environmental Performance Based Management and Regulation of Land-based Freshwater Salmon Aquaculture in New Brunswick. This Code of Practice includes best management practices for all freshwater salmon facilities and will contribute to enhanced environmental sustainability, ensure regulatory compliance with the new PBS, promote operational efficiencies, enhance fish health management and worker safety and facilitate interaction with other resource users. The development of Best Management Practises may also help facility managers identify areas for improvement within their effluent treatment systems, and help identify potential for new, greener technology.

This Code, just completed, could serve as a template for other Atlantic jurisdictions where our members operate.

PAN-ATLANTIC WORKSHOPS

The ACFFA co-hosted a Pan Atlantic workshop which brought together industry, provincial regulators, provincial veterinarians and federal regulators, including the Canadian Food Inspection Agency (CFIA) to develop template(s) for Standards of Practise to support the management of reportable disease in Atlantic Canada. Templates are currently being developed for industry and government review. This work will continue into 2014. We will host a second workshop / meeting to follow through on all outstanding issues and to ensure we build consensus. The ACFFA also hosted a Pan Atlantic meeting to develop new escape mitigation protocols that can become part of a Pan Atlantic Code of Containment.



CONSERVATION AND ENVIRONMENTAL STEWARDSHIP

The ACFFA and our members work collaboratively with a range of stakeholders to enhance our environmental stewardship. Our members participate in a variety of conservation-based activities from providing hatchery services for wild salmon rehabilitation projects to supporting fund-raising dinners and events or through direct donations to conservation programs.

The ACFFA worked collaboratively on the award-winning Inner Bay of Fundy Salmon Recovery Project for several years. This work continued into late 2012 when the last group of salmon was released. The intent was to start another three-year project; however, Parks Canada and the Department of Fisheries and Oceans did not have funding to continue the project in 2013/2014. We will be working with our members and are hopeful this project can begin again in 2014, with Fort Folly First Nations as another collaborator.

The salmon farming industry gained positive feedback from regulators, community members, media and others for the lobster survey work done by Benson Aquaculture and Sweeney International Marine Corp. This work will continue until 2015. The ACFFA also continues to participate on the Nova Scotia Salmon Association, and we have supported our members in meetings with stream keeper organizations to support increased knowledge and understanding of salmon farming that could lead to potential collaborative rehabilitation projects.

The ACFFA continues to participate on the New Brunswick and Nova Scotia Aquaculture Environment Coordinating Committees. In New Brunswick, our representatives have played a key role in shaping the research strategy and developing the performance based standards for fresh water operations. Nova Scotia's AECC is not expected to meet until that province's regulatory review process is complete. We are advocating for a program in Nova Scotia similar to that in New Brunswick which could support our goal of a harmonized regulatory approach in the region.

The ACFFA continues to build and strengthen relationships with the environmental sector.

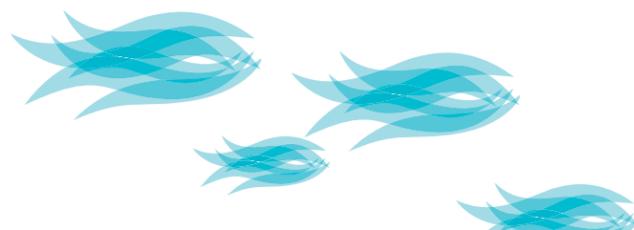
In 2013 the ACFFA has been involved in the following activities:

- Member of the Canadian delegation to North Atlantic Salmon Conservation Organization
- Member of the Atlantic Salmon Advisory Committee
- Member of the Saint John River Advisory Committee
- Member of the Inner Bay of Fundy Atlantic Salmon Conservation and Recovery Team
- Attended the Atlantic Salmon Federation's Wild Salmon Recovery Workshop
- Meeting with the Hammond River Salmon Association
- Attended the Atlantic Lobster Sustainability Foundation Science Workshop

We are exploring the potential collaborative involvement in a community based TV series focused on marine science with conservation and traditional fishing sector and research institutions in southwest New Brunswick.

We also continue to invite conservation organizations such as the Atlantic Salmon Federation and representatives from the Atlantic Coalition for Aquaculture Reform to attend and participate in research meetings and industry open houses in both Nova Scotia and New Brunswick.

The ACFFA and our members work collaboratively with a range of stakeholders to enhance our environmental stewardship.





Atlantic Canada's salmon farmers depend on new technology and science-based research to grow their fish and to help feed the world. They are committed to building the most responsible and innovative aquaculture industry in the world.

Our salmon farmers work with top scientists from the federal and provincial governments, universities and the private sector on a wide variety of research projects aimed at strengthening and improving their industry.

Leading the development of a research program that advances fish health priorities is one of the ACFFA's main roles. The ACFFA has been challenged in recent years to maintain a presence and a voice in research being discussed and/or developed by regulators. Budget cut-backs at the federal and provincial level are making it increasingly difficult for industry to leverage funding for collaborative research. However, we will continue to advocate for a fully inclusive collaborative approach in all R&D that involves academia, researchers, government departments and agencies as well as our industry colleagues.

In light of reduced financial and human resources, we advocate for a collaborative Pan Atlantic approach to optimize resources to advance our goals to access the necessary tools for sea lice management and other fish health priorities, development research, and research to support enhanced environmental management.

The ACFFA hosts an annual research workshop with a broad base of researchers and also networks with colleagues throughout the year at a range of R&D meetings. The ACFFA is also exploring non-traditional collaborative opportunities and is working with the Huntsman Marine Science Centre and others to identify and formalize a research cluster that will support a coordinated and collaborative approach to research.

The ACFFA continues to make themselves available for the management of any industry inclusive R&D projects.

Research / activities in which ACFFA is an active participant on behalf of the salmon industry

- Aiding the continued hydrological study in the Grand Manan area to support improved modeling and future Aquaculture Bay Management Area (ABMA) review through an Aquaculture Collaborative Research and Development Program project
- Continued support and use of the Decision Support System and potential expansion to include other fish health tracking; in addition to the publication of white papers and peer reviewed papers using DSS data
- Investigating and informing industry regarding new sea lice technologies (i.e. lasers, delivery systems for tarp treatments, etc.)
- Supporting ACFFA members in their research activities (broodstock development, green innovations for sea lice management, etc.) and communicating research data when/where appropriate
- Development of a white paper on issues relevant to the salmon farming industry
- Supporting a collaborative project for the development of a robust methodology for sulphide probe calibration with Sweeney International Marine Corp

RESEARCH PROJECTS



Other research projects that are being led by salmon farming companies include:

- Cleaner fish research (Cunner fish and other species)
- Residue testing for various fish health medicines
- Efficacy of mussels as a filter for sea lice and lice traps
- Hydrogen peroxide bath effects on salmon skin epithelium
- Broodstock development
- Quantifying salmon feed waste
- Feed trials to test alternate feed ingredients
- Sediment profile imagery

MAINTAINING RELATIONSHIPS

The ACFFA is proactive in maintaining relationships with R&D agencies and collaborators at the regional, national and international level by participating in research workshops and in the development of collaborative research programs. This included attendance at:

- Aquaculture Association of Canada Conference
- Aquaculture Association of Canada Science Panel Workshop – A Review of Microbial Pathogen Exchange Between Wild and Farmed Aquatic Organisms
- Atlantic Lobster Sustainability Foundation Science Workshop
- Aquaculture Collaborative Research and Development Program Annual Meeting
- Viral Management and Emergency Preparedness Workshop
- AquaNor Science Workshop
- PHARMAQademy Fish Health Meeting; AquaNor 2013
- Multi-Nation Sea Lice Workshop – Fish Welfare in Aquaculture Workshop

The ACFFA participates on a variety of R&D based committees and/or networks including:

- Aquaculture Association of Canada
- AAC Annual Conference Program Committee
- Atlantic Canada Aquaculture Industry Research and Development Network (ACAIRDN)
- National Fish Health Working Group
- Aquaculture Collaborative Research and Development Program – National Committee
- Aquaculture Collaborative Research and Development Program – Technical Committee
- Multi-Nation Sea Lice Working Group – Fish Welfare in Aquaculture Working Group
- Aquaculture Environment Coordinating Committee Research Sub-committee

TRAINING OPPORTUNITIES



The ACFFA also provides workshops and training opportunities for the industry. During the past year we offered the following:

- Co-hosted Viral Emergency Preparedness Workshop, May 2013
- Co-hosted and international workshop on sea lice management at AquaNor August 2013
- ACFFA R&D Technical Workshop – November 6&7, 2013

ACFFA's Research and Development Coordinator also attended a variety of meetings hosted by traditional fishing and conservations organizations to ensure that accurate information was provided about salmon farming operations.



CONTINUING TO BUILD OUR INDUSTRY



ATLANTIC AQUACULTURE MISSION 2013

If Atlantic Canada truly wants to reap the benefits that salmon farming could bring to our region, we have to look to other global aquaculture leaders.

That's why we undertook a major project in 2013 aimed at enhancing Atlantic Canada's position as a globally competitive leader in sustainable aquaculture. The ACFFA initiated, organized and led an Atlantic Aquaculture Trade Mission to Norway and Scotland from August 8-16, 2013.

Our 43 participants represented all four Atlantic Provinces and included professionals who work in almost all facets of the aquaculture industry – from fish farming, processing, net-making, research, marketing and environmental monitoring as well as federal, provincial and municipal officials and aquaculture association representatives.

Mission participants learned about the global aquaculture industry, toured fish farms, processing plants and feed plants to see first-hand how new technology is being applied in Scotland and Norway. They also met with community officials, regulators and industry representatives in both countries and attended AquaNor 2013, the biggest aquaculture trade exhibition in the northern hemisphere.

The Mission gave participants the chance to see aquaculture's potential by observing operations at a scale significantly greater than what we see in Atlantic Canada.

They learned that other countries like Scotland and Norway have visions and sustainable plans to grow their aquaculture industries. The lessons we learned will help us continue to grow our industry here at home.



CONTINUING TO BUILD OUR INDUSTRY



SUPPORTING A SOUND REGULATORY SYSTEM

One of the biggest roadblocks growing our region's aquaculture industry is Canada's complex, confusing and uncertain regulatory framework.

Advocacy work continues in support of enabling, science-based regulation and policy to enable sustainable aquaculture development in Atlantic Canada. This includes an Aquaculture Development Strategy for Canada, sound regulatory development in Nova Scotia, and a collaborative approach to harmonization of regulation and policy for salmon farming in Atlantic Canada.

The ACFFA advocates for regulations that are clearly defined and evidence-based. They must be comprised of internationally competitive, regulatory performance standards that encourage the investor confidence necessary to grow a sustainable aquaculture sector. Science and performance based regulation must be free of red-tape and allow the implementation of new technologies and innovation in a timely manner.

The ACFFA continues to support a regulatory and policy review for aquaculture in Atlantic Canada. The Atlantic Canadian Aquaculture Ministers have agreed to work together on a variety of issues including fish health regulation and criteria for aquaculture bay management areas, but

progress has been slow. The industry must be fully engaged in this process so that it can bring valuable practical knowledge and experience on the regulatory framework that is currently in place and bring on-farm expertise to the table.

NOVA SCOTIA'S REGULATORY REVIEW PROCESS

The ACFFA has been actively engaged in Nova Scotia's regulatory review process. We developed a white paper "Developing An Aquaculture Regulatory Framework for Nova Scotia" which serves as a basis for our submission to the Doelle-Lahey Panel, responsible for the independent aquaculture regulatory review in Nova Scotia.

A modern regulatory framework must be evidence-based, efficient, predictable and accountable so that farms can operate successfully and to provide the confidence necessary to attract investment to grow a sustainable aquaculture sector. Such a framework will also provide the basis for public confidence that the aquaculture industry in Nova Scotia is responsible and accountable.

Representing industry on federal and provincial committees and working groups is important to ensure our industry can operate within an enabling regulatory environment and to ensure industry issues and concerns are addressed.

The ACFFA continues to build strong relationships with aquaculture interests in key areas of Nova Scotia and New Brunswick and across Canada. We work with a range of interest groups, both internal and external to our industry, to support sustainable aquaculture development. We engage the Newfoundland Aquaculture Industry Association in collaborative public and consumer education activities and are proactively working with them to support research into the viability of importing disease-free eggs for Newfoundland production.

In 2013 the ACFFA participated in the following are committees and/or working groups:

- Nova Scotia Salmon Association
- Aquaculture Environmental Coordinating Committees – Nova Scotia and New Brunswick
- Nova Scotia Regulatory Review Roundtable
- Atlantic Canadian Aquaculture Industry Research Development Network
- Inner Bay of Fundy Atlantic Salmon Recovery Team
- New Brunswick Marine Advisory Committee
- New Brunswick Industry/Government Fish Health/IPMP Working Group
- Musquash Estuary MPA Advisory Committee
- Department of Fisheries and Oceans Sustainability Reporting Initiative Working Group
- Canadian Science Advisory Secretariat Stakeholder Panel for sea lice, European egg imports and wild salmon SARA reviews
- National Fish Health Working Group
- Aquaculture Collaborative Research Development Program National Steering Committee & Technical Review Committee
- Atlantic Salmon Advisory Committee
- North Atlantic Salmon Conservation Organization Canadian Delegation

The ACFFA plays an important role on behalf of our members in building relationships nationally and internationally. In addition, we provide information to our members on how the international salmon farming industry approaches sustainability verification, corporate sustainability and how these are integrated into their communications and marketing programs. We participate in the development of sustainability reporting systems and support various certification programs.

The ACFFA is active in the following:

- Executive member of the Board of Directors for Canadian Aquaculture Industry Alliance
- Member of the National Aquaculture Strategy Industry Government Working Group
- Member of the Aquaculture Association of Canada
- Participant in the Aquaculture Sustainability Reporting Initiative Technical Working Group
- Member of the International Salmon Farmers Association

The ACFFA also attended /participated in the Boston Seafood Show. The ACFFA supported presentations made on behalf of our industry at the World Aquaculture Conference and European Aquaculture Conference.

Membership in Canadian aquaculture industry associations and participation in national projects ensures members of the ACFFA have a voice in influencing decisions that are made on behalf of the industry and keeps them informed on activities that could impact their sector.

The ACFFA has attended meetings of the following Canadian industry associations:

- Canadian Aquaculture Industry Alliance
- Aquaculture Association of Canada
- Atlantic Canada Aquaculture Industry Research and Development Network
- Newfoundland Aquaculture Industry Association's Cold Harvest Conference
- Aquaculture Association of Nova Scotia Sea Farmers Conference

The ACFFA also nominated two of our members to sit on the AAC Board of Directors; Tom Taylor was elected. ACFFA staff is participating on the program committee for the AAC 30th Anniversary Conference to be held in St. Andrews in June 2014.



CONTINUING TO BUILD OUR INDUSTRY



TRAINING AND EDUCATION

The ACFFA works to increase awareness of career opportunities that aquaculture brings to rural and coastal communities. Through collaboration with the NB Community College, we raise awareness in high schools of career opportunities available in aquaculture. The ACFFA provides support materials for the use in these presentations.

Raising awareness of our industry with high school students and communities is intended to support workforce development, but it also helps to support an understanding of the salmon farming industry in the communities where we operate and in our region as a whole.

The NBCC made presentations to: Oromocto High School in February and hosted two environmental science classes from Fundy High School in May, and St. George Elementary School in April. Grade 11 and 12 students from Eastview High School, from Barrie, ON, visited NBCC to learn about aquaculture in May. In addition, the NBCC made a recruitment trip to the Gaspé Peninsula to speak with First Nations groups and others about aquaculture. This presentation was held at Gesgapegiag at the Galgoasiet Natural Resource Centre, and included students from Bonaventure, New Richmond, Listuguj, and New Carlisle.

As part of the Fish Welfare in Aquaculture Workshop, NBCC hosted an Education and Training in Fish Welfare Session on November 17, 2012. Instructors and students from NBCC joined those from University of Quebec, the University of New Brunswick, and Mount Allison University to learn more about fish welfare in aquaculture from leading experts on this topic.

While there have been some presentations in Nova Scotia high schools, our intention in the coming year is to explore collaboration in Nova Scotia to expand opportunities.

In the past year, ACFFA staff and other industry members have made presentations to classes at the NB Community College, students at UNB and Dalhousie and at community meetings in St. Andrews. The ACFFA RDC and Sweeney International Marine Corp. staff also participated in a virtual job fair for local high schools.

The ACFFA continued to lead the Aquaculture Health and Safety Working Group which identifies shortcomings in regulation and opportunities for coordinated training. We also continue to work closely with our members and provincial governments to support increased development and delivery of training opportunities.

In 2013, the ACFFA worked with WorkSafe NB to develop a WorkSafe NB Marine Fish Farm Inspection Program. The ACFFA worked with WorkSafe NB to ensure that appropriate biosecurity protocols were in place to support its farm audit program. Work is continuing on the industry Code of Practice, and we will meet with WorkSafe NB to finalize the document.



TELLING OUR STORY

We're getting better at telling people how we farm, what we do to protect the marine environment and how we bring prosperity and jobs to coastal communities.

TELLING OUR STORY



We embarked on a broader, Pan Atlantic approach to our communication efforts in 2013.

In collaboration with the Newfoundland Aquaculture Industry Association, the ACFFA developed a comprehensive Pan Atlantic communications plan to provide accurate information on the salmon farming industry and opportunities for consumers, local citizens, traditional fishers, conservationists, tourists and others to learn about modern farming practices, research and technology development activities, our industry's role in local communities and our environmental and conservation activities.

We're getting better at telling people how we farm, what we do to protect the marine environment and how we bring prosperity and jobs to coastal communities.



Yet, misinformation and myths about salmon farming continue. We made use of a new website – www.ActforAquaculture.ca – to challenge misinformation by blogging about a variety of topics, including closed containment, environmental sustainability, fish health management practises and fish quality and safety.



We also updated our website and collateral materials for our All About Salmon consumer program. The refreshed website can be found at www.allaboutsalm.com. Our new Fresh Facts and Naturally Healthy brochures have proven popular with consumers. The ACFFA also supported the Atlantic Canadian Aquaculture Industry Research and Development Network (ACAIRDN) in the development of a professional brochure to promote the important work of our Atlantic Research Development Coordinators.



FINDING NEW WAYS TO COMMUNICATE

We made better use of social media in 2013. We used Facebook and Twitter more often to share information about salmon farming and spread the word about farm tours or other association activities.

In support of our Atlantic Aquaculture Mission, we launched a blog – Memos from the Mission. The blog was updated regularly during our eight-day mission.

The blog can be found at: www.memosfromthemission.wordpress.com

The ACFFA continued to spread the word about our industry in other ways in 2013:

- Promoting and conducting farm tours
- Speaking a schools and to communities groups
- Outreach to politicians and political candidates
- Participating in Bay of Fundy Seafood Week



WE WOULDN'T EAT SICK FISH EITHER. AND WE'RE NOT. NO ONE IS.

FEBRUARY 14, 2013

There has been a lot written and said about salmon farming and ISA – infectious salmon anemia – over the past few weeks.

It's time for all of us to remember some facts and not give in to scare tactics and misinformation. In a world where 870 million people don't have enough to eat (Source: UN World Food Programme), anti-salmon farming activists are trying to use misinformation to needlessly waste more than one million pounds of quality protein. That's enough for about six million meals. Their goal is to shut down Canada's salmon farming industry, and fear mongering about ISA – with complete disregard for science and fact – is their latest tactic.

Recent headlines have been exciting to say the least. No wonder consumers are concerned when media stories leave the impression that sickly, diseased fish are being sent to local grocery stores.

The truth is far less lurid.

Here are the facts:

ISA is not a food safety issue. ISA is only ever a fish health issue. A salmon that's been exposed to ISA poses no food safety concern. The flesh is unaffected in terms of quality and nutrition. The virus does not survive at room temperature and certainly not at body temperature, and ISA does not affect mammals.

No one is trying to sell you "sick" fish. The Canadian Food Inspection Agency does not allow sick fish into our food supply. The fact is a Cooke Aquaculture farm near Liverpool, NS, is operating under quarantine because ISA was detected there. Two cages of actual sick fish were humanely destroyed, voluntarily, as soon as ISA was suspected to prevent the spread of the virus. This was done in coordination with the CFIA. Remaining fish showed no clinical signs of ISA, so CFIA decided the company could operate the farm under quarantine and grow the fish to market size. Any fish showing signs of illness continued to be culled from the farm during this process. The fish now being harvested are inspected by CFIA and show no signs of illness.

ISA won't make you sick. At least two well-known critics of salmon farming have tried to make a connection between ISA and humans. It's a scare tactic. But it works only if you ignore science. We're not sure why some journalists are willing to broadcast those sound bites, but the fact is, this assertion defies virology and common sense. This notion has been refuted repeatedly by biologists, veterinarians and scientists. Despite this clear, science-based conclusion, the critics continue to try to fuel fear.

ISA is not new. It is a naturally-occurring virus that affects salmon and other finfish like cod, herring and brown trout. ISA is manageable. East Coast salmon farmers have lived with and managed ISA since 1996. ISA does not mark the demise of an industry.

Because ISA is in the natural environment, fish that have been exposed to ISA – wild caught or farmed – from Canada, Norway, Chile or other countries have been caught, harvested, processed and sold in Canadian and US stores for decades. By allowing a group of fish from Nova Scotia to be harvested, the CFIA has not rewritten the rule book. We wonder why anti-salmon farming activists are focusing on locally-grown fish from a farm where ISA was detected, but don't seem to care that other imported seafood has come from ISA positive sites. Don't let them fool you into thinking they're concerned about your health. They know ISA isn't a threat to you, but they will coldly use it to cast doubt and manipulate your attitude because right now it serves them to do so.

Local seafood remains just about the healthiest food you can buy at the grocery store. We should all eat more seafood, whether it's farmed or wild caught. It is a great source of healthy protein, and fish like salmon are one of the best sources of Omega 3 essential fatty acids you can find. When you buy local seafood, you are supporting your local fishermen and farmers and your local economy.

It is wrong to paint ISA as a human health issue. It is wrong to use a fish virus as an inroad to frighten consumers away from a good, healthy, locally-produced food source. And to suggest that an entire farm of perfectly-good fish should be destroyed under false pretenses and rhetoric – well, that's more than just a little sick.

OUR PLEA TO NL MHA JIM BENNETT

APRIL 5, 2013

Dear Mr. Bennett:

For the love of Pete, please Mr. Bennett, come and visit a salmon farm in the province you represent.

We really and truly want you to see how a modern fish farm operates. We want to introduce you to the hardworking and passionate folks who raise our fish, and we want to show you our farm management and fish health practises.

We want you to come as soon as possible because, quite frankly, you need some education about one of the fast-growing industries in your province, one that is revitalizing your coastal communities.

Your recent media release alleging that salmon farming is destroying the marine environment contains so many inaccuracies that it's hard to know where to begin.

But separating fact from fiction is what we do here at Act for Aquaculture, so here we go.

You say that British Columbia's Liberal government will not approve future salmon farms. That's not correct. First, the BC government issues only site leases, not licenses, and their moratorium is only for one small area of the Province, not the entire Province. And just so you know, issuing licences in BC is the purview of the Department of Fisheries and Oceans in that Province.

You say that it is mind boggling for Newfoundland and Labrador to continue to approve salmon farms when the rest of the country is headed in the opposite direction. Again, that's not correct. Just look to Nova Scotia. That province has a new Aquaculture Development Strategy aimed at growing its salmon aquaculture industry and has recently approved two new farms. Nova Scotia is working hard to capitalize on the unprecedented opportunity for its rural communities to benefit from and realize the potential of a locally-based, globally competitive, sustainable aquaculture industry.

You call on the Newfoundland government to move the industry to closed containment by claiming that consumers are willing to pay a higher price for salmon grown to market size that way and by claiming that closed containment generates higher employment.

The facts tell a different story.

Here's what you need to know about closed containment:

- Atlantic Canada's salmon farmers are experts in closed containment because our fish spend the first third of their lives in land-based hatcheries where these recirculation systems are used.
- We know that closed systems may work on some species, but the technology just isn't there yet to grow Atlantic salmon in closed containment tanks at a commercial scale.
- Over 45 trials have been fully evaluated by a panel of international experts; all failed. More recent attempts like BC's AquaMarine farm in Middle Bay shut down after spending about \$10 million of Canadian taxpayer money while another site in Montana operated by a Hutterite colony has also closed.
- Closed containment systems require large amounts of fresh water and huge amounts of electricity that cause harmful greenhouse gases. Did you know the economic study that showed closed systems might be marginally successful was based on power costs of .06 cents per kilowatt hour when in reality the costs for that power run between .11 and .16 cents in Atlantic Canada?
- Fish grown to market size in tanks would be cramped and stressed. That same DFO study shows that to make closed containment marginally viable, farmers need to grow fish at a biomass of 50 kg/m³. Our fish are stocked at 15-17.
- If salmon farms are moved to land based facilities, production would move from rural coastal communities to urban centres like Boston and Toronto close to the markets. That would take valuable jobs and economic activity from coastal communities.
- And finally, the average consumer wants their food grown in the most natural way possible. For fish, that isn't on land. Plus, that same consumer is then not going to spend over twice as much for a sub-standard product – because quite frankly salmon grown in fresh water facilities just doesn't taste like salmon!

Mr. Bennett, you need to know that Atlantic salmon farmers are producing a healthy product in a sustainable way now. Our salmon farmers are backed by 30 years of experience and are global leaders in our industry. Modern salmon farming does not have a negative,

long-term impact on either the environment or on other species.

Finfish farming alone created 700 jobs in your province in 2011 and had a production value of \$115 million.

So, please, come and find out about our industry for yourself by visiting a salmon farm in your province.

Your constituents deserve that.

Or at the very least, they deserve an MHA who does his homework before issuing a media release.

FISH TALES HELP FUND ASF'S LATEST SMEAR CAMPAIGN

APRIL 19, 2013

Atlantic Salmon Federation President Bill Taylor schmoozed another \$100,000 at a Halifax fundraiser recently. And he likely needs the cash to pay for ASF's negative, misguided and expensive PR campaign bashing Atlantic Canada's salmon farming industry. (Chronicle-Herald, April 11, 2013)

We just wonder why now? Salmon farming has been operating in both an economic and environmentally sustainable manner in Atlantic Canada for over 30 years. Is his attack on salmon farms just a cause du jour to help fill those coffers?

Mr. Taylor's latest sales pitch is to convince his donors to dig a little deeper so that ASF can grow Atlantic salmon in tanks in places like West Virginia. He said they could grow fish better than professional salmon farmers can grow them in their natural environment, the Atlantic Ocean.

Sounds fishy to us.

Mr. Taylor pitches the ASF faithful on a long list of benefits to growing salmon in tanks. He's on record, for example, saying there are no disease issues when you raise fish in tanks (Salmon Farming's Foul Record, NB Telegraph-Journal, Nov. 29, 2012). That really is amazing! I can't wait to tell my goldfish the good news. And the entire industry dedicated to the health of fish in tanks will be pleased to know that their services would no longer be needed.

What are some other benefits to growing Atlantic salmon in tanks, according to Mr. Taylor?

Well, he says land-based tank farms have a lower carbon footprint than ocean farms despite the fact that oceans are absolutely full of that stuff salmon seem to really thrive on – you know, clean, cool water and oxygen. Never mind that closed containment tank farms need to constantly pump and filter water through the systems while salmon farmers foolishly let natural forces like tides and currents do that kind of work. Mr. Taylor says tanks are a better environment for fish than even their natural environment is. Think about it – if you're a fish, would you want to be penned in the ocean with all kinds of room to swim around and school or would you rather be packed fin-to-fin in a tank playing sardine with some of your closest friends?

Why don't any of ASF's PR materials touting land-based fish farms

ever seem to mention the large amounts of continuous electricity that land-based systems need and the huge carbon footprint left as a result?

Mr. Taylor says that big savings to the environment will come from – wait for it – trucking!

Mr. Taylor told the CBC recently that Atlantic Canada’s salmon farmers have to truck their products huge distances – such as the 581 kilometres from St. George, NB, to Boston, MA. (By the way, the ASF trucked West Virginia smoked salmon four times that distance for the big fundraiser feast – or did they fly?).

When asked how land-based farms would reduce the environmental impact from trucking, Mr. Taylor had a simple answer. The tank farms would be located closer to markets in places like New York or Boston or Toronto. Perfect! That means all those busy wharves and harbours in places like Meteghan, NS, or Hermitage, NL, or Back Bay, NB, will revert to nice, quiet spots. Those thousands of jobs and millions of dollars of economic activity can move out of Atlantic Canada to someplace that really needs the stimulus – maybe New Jersey would be a nice salmon capital of the Eastern Seaboard.

But a donation to the ASF didn’t just get Mr. Taylor’s guests a meal and some stories about a better way to farm salmon.

Around the room they could see examples of the ASF’s recent work. No, not samples of river stocking, education programs or maybe a campaign aimed at helping wild salmon by mitigating factors such as hydro dams, municipal outflows, climate change or acid rain. No, the room at this dinner was decorated with samples of a newspaper and billboard smear campaign telling Atlantic Canadians that their friends and neighbours who work in our region’s fish farming industry are doing a terrible job. ASF is telling their donors that salmon farmers – the same farmers who work with them on their wild salmon rehabilitation projects and the same farmers ASF worked with to start the aquaculture industry 30 years ago – raise awful fish and are bent on destroying the ocean.

ASF is using the money it raised to turn our hardworking salmon farmers into the fall guys for the complex decline of wild Atlantic salmon populations that started long before there was a salmon farm.

Well, Mr. Taylor, we hope you earned enough money at your dinner circuit to cover the costs of your misinformed PR campaign.

We don’t know how many wild fish you’re saving with those billboards and newspaper ads, but we do know those things aren’t cheap.

ENOUGH ALREADY WITH THE SCARE TACTICS

JULY 2, 2013

Here’s some information you oughta know: If Canadians ate more Omega-3 rich seafood such as farmed salmon, 12,240 lives could be saved each year.

Imagine - 12,240 people saved. That’s the population of Grand Falls-Windsor, NL.

It’s a startling statistic – but it shouldn’t be. Nutrition experts

continue to tell us about the power of Omega-3 and we know that oily fish like farmed salmon are an excellent source. Contrary to the scare tactics employed by salmon farming critics, the fact is Omega-3 rich seafood like farmed salmon is one of the healthiest foods you can eat.

A Norwegian tabloid newspaper and the Huffington Post both recently published articles saying farmed salmon is not good for you because it contains high levels of pollutants.

What utter nonsense.

The “scientists” in the Norwegian article were a pediatrician and a physician at a hospital in Bergen, Norway. Neither of them has published any research related to farmed salmon and both are suspected of having anti-salmon farm sympathies based on other false statements they have made about our industry.

Persistent organic pollutants (dioxins and PCBs, which have dioxin-like properties) have been in the environment for decades. These substances are in most of the food we eat – in trace amounts.

What we know is that farmed salmon contains less trace amounts than many other staples of the North American diet.

The Canadian Food Inspection Agency’s daily limit for PCBs is 2.0ppm and farmed Atlantic salmon contains 0.014ppm; for dioxins the Health Canada limit is 20ppt; farmed Atlantic salmon contains 0.082ppt. A USFDA study shows that butter has five times the amount of PCBs than farmed salmon and both are still well below USDA limits.

Most nutritionists, medical doctors and even the Food and Agriculture Organization of the United Nations conclude that the health benefits from eating oily fish such as farmed salmon on a regular basis far outweigh any risk posed by trace levels of contaminants.

The US Food and Drug Administration, UN FAO and Health Canada do not suggest any consumption limits on farmed salmon for pregnant mothers and for children.

Charles Santerre, Professor of Food Toxicology at Purdue University, cites farmed salmon as one of the healthiest seafood choices because it is low in mercury and high in healthy fats. He recommends eating 8-12 ounces of seafood such as farmed salmon every week. That’s two pieces of fish. And that small amount can not only help you live longer, it can help you live better. Or as Santerre puts it, eat fish and you’ll increase your “diaper spread” – the life you live after you’re out of diapers and before you’re back in them.

Recent academic studies indicate that eating Omega-3 rich seafood can reduce the risk of coronary death by 36 per cent and increase life expectancy by 2.2 years.

In economic terms, those 12,240 lives saved in Canada by eating more Omega-3 rich seafood would bring an estimated \$8.5 billion per year in benefits. And that figure does not take into account the billions of dollars in health care costs that would be saved along with those lives.

So seafood is one of the healthiest foods you can eat, will help save

lives, improve lives and benefit our economy tremendously.

We should be encouraging the public to eat more seafood, not scaring them away from it with misinformation and ill-informed opinions.

To learn more about the health benefits of eating farmed salmon, check out www.allaboutsalmom.ca.

WHAT THE “ANTI” OCEAN-FARMED SALMON IDEALISTS DON’T LIKE TO TALK ABOUT

AUGUST 27, 2013

The Atlantic Salmon Federation is hosting a fundraiser tonight featuring “new environmentally sustainable Atlantic salmon” to raise money for its Land-Based Closed Containment Salmon Aquaculture Program.

I can’t help being irked by the implication that ocean-farmed Atlantic salmon aren’t environmentally sustainable. The salmon farming industry has been growing fish sustainably for 30 years in this region. I also can’t help being frustrated by ASF’s continued efforts to dupe the public into believing that ocean-farming should be banned and that it’s possible to move all existing salmon farms from the Atlantic region onto land-based tank farms.

They want you to believe that it is possible, and if that was true, the result would be a much more environmentally friendly industry. They are trying to convince you they are the experts in land-based salmon farming and there is much they could teach our region’s salmon farmers.

Are they telling the truth? Let’s see.

ASF doesn’t talk about the fact the industry already has considerable experience in land-based recirculating aquaculture systems (RAS); in fact, they are leaders in the technology with world-class facilities right here. The industry continues to develop this technology in their freshwater farms to maintain healthy broodstock and progeny, and minimize the amount of precious water used in their operations. Local farmers also know this is a costly way of growing fish given the electricity, pumping, heating, labour and infrastructure costs involved. So while it is justifiable for raising broodstock and millions of small fish, the economic facts simply cannot support growing fish on land through all phases of the farm’s production. A DFO study showed that when reasonable assumptions were used in developing an economic model, an RAS based operation was not profitable. Not only that, two recent trials – one in New York and one in Montana – have just closed down.

Even if it were technically and economically feasible, and if the land and access to good water and stable power supply were available (a lot of “ifs”), it would require the equivalent of approximately 8,500 football fields to accommodate the tank farms needed to grow a modest estimate of 30,000 tonnes of farmed salmon annually in New Brunswick. Those opposed to salmon farming say “Oh, no; it would only take 850 football fields (including end zones) to grow this amount!” How can this be? Because their plan is to grow fish at a stocking density of 100 kg/m³. The local industry recognizes that a

natural stocking density should be in the order of 15-18 kg/m³. The 100 number will surely bring about animal welfare issues, let alone lead to potential disease problems. ASF accuses industry of operating “feedlots” but the closed containment systems they are proposing would crowd fish in recycled water at 5-6 times what they would experience in spacious, clean, self-refreshing seawater farms.

I visited ASF’s RAS research facility in West Virginia; some interesting work has been done there, some of which is useful for our broodstock facilities. And yes, it is true that they can grow fish experimentally at high densities in relatively short periods of time, even if the recirculating growing water does not look very appealing. However, what they don’t like to talk about is the fact that it takes 10-15 days of depuration in flow-through fresh water to reduce the musty taste of the flesh. Moreover, during this period when the fish are not fed they may lose four per cent of their body weight and the flesh quality is downgraded as well. Take note if your “new, environmentally sustainable” Atlantic salmon was served smoked at your dinner...smoking the flesh masks the off-flavour.

Yes, there are plans to improve their experimental RAS to eliminate these off-flavours so that long periods of depuration in fresh flow-through water are not necessary. In time, perhaps, this will come about, but it is no easy task to eliminate the bacteria causing the off flavours without eliminating the important bacteria needed to maintain the integrity of the RAS biofilter.

Perhaps what ASF doesn’t like to talk about most are the volumes of freshwater needed for depuration. Perhaps people don’t quite understand what depurating a few thousand fish in running water for 10 days really means. The local industry experts tell us that proper depuration means that the water in the tanks of fish should be drained and replaced on an hourly basis. To do this for 30,000 tonnes, at a proper stocking density of 18 kg/m³ would mean a flow rate of approximately 16,000 ft³/sec for a depuration period of 10 days. To put this in context, the summertime flow rate of the St. John River over the Mactaquac Dam is approximately 7,000 ft³/sec. Or in other words, to depurate the annual New Brunswick production of farmed Atlantic salmon would require the equivalent of diverting more than double the flow of the St. John River in the form of “new” water derived from wells, streams or rivers. With water becoming an increasingly precious resource, this would be an unconscionable waste of such a resource, especially since it could only produce an inferior product that is much better coming from self-replenishing ocean farms.

We haven’t talked about where these land farms would be located – not in Atlantic Canada so what happens to our economy and the thousands of jobs we have here?

To those who attend ASF’s dinner this evening, here’s the truth: moving all of Atlantic Canada’s salmon production to land is not environmentally sustainable or economically feasible. And the salmon grown to market in land-based tanks won’t be anywhere near as tasty as the fresh Atlantic salmon from the ocean that we can buy at reasonable prices in our own grocery stores every day.



ENVIRONMENTAL IMPACT

INNOVATIVE TECHNOLOGY

Salmon farmers use underwater cameras and sensors to monitor feed delivery, avoid overfeeding and eliminate waste.

SAFE FOR OUR OCEAN

Lobster landings have increased in many areas where salmon farming also thrives.

Only approved treatments deemed safe by regulators are used to treat sea lice. No sea lice treatments have been necessary in Nova Scotia.



HOW SALMON ARE FARMED

THE LIFE CYCLE OF FARMED SALMON

Farmed salmon grown in Atlantic Canada originate from St. John River wild salmon. They begin their life cycle as eggs, which are collected from adult salmon broodstock, and placed in temperature controlled tanks in a freshwater hatchery.

After about one year, the young salmon are moved to saltwater farms where they continue to grow for another 18-24 months in large floating net pens that are moored to the ocean floor. The pens rise and fall and are flushed by the tide.

CAREFUL SITE SELECTION

Salmon farm sites are carefully chosen in areas where water currents naturally provide the best conditions for fish well-being and environmental sustainability. Regulators oversee detailed site-specific environmental assessments before farming operations are permitted.

APPROVED FARMING PRACTISES

Atlantic salmon farmers adhere to environmental policies and codes of practice developed with government, researchers and the community. Fish farms are regulated by both the federal and provincial governments. Farms are inspected regularly and their records are audited. Some of their farming practices include:

- Monitoring water conditions
- Routinely following their farms between crops
- Conducting regular maintenance and inspection of net pens
- Monitoring of the ocean floor, feed delivery and the health of their fish

STRONG AND EFFECTIVE NET PENS

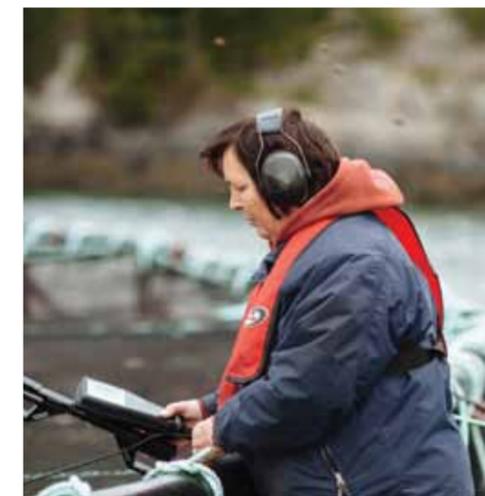
Preventing escapes is a top priority for Atlantic fish farmers, who have developed a Code of Containment that details rigorous guidelines for the design of pens, their mooring systems and netting. Escapes have been dramatically reduced since the early 1990s and have been estimated at well below one per cent in every year since 1995. Regulation requires that all escapes over one hundred fish are reported.

KEEPING IT NATURAL

Salmon occupy less than four per cent of the space in their net pen and have plenty of room to mimic natural schooling patterns.

INNOVATIVE TECHNOLOGY

Salmon farmers use underwater cameras and sensors to monitor feed delivery, avoid overfeeding and eliminate waste.



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COMMITTED TO PROTECTING THE ENVIRONMENT

Atlantic salmon farmers are local people who have built this industry over the past 30 years. They know that if they don't care about sustainability, then they can't farm, and their neighbours can't fish, and the ocean they love won't be here in its present form for their children and grandchildren.

WORKING TO REDUCE WASTE

Pristine seawater is essential for the production of healthy, high quality salmon, so salmon farmers follow strict codes of practise regarding waste management. In addition to using underwater cameras and sensors to avoid overfeeding, farmers have tailored feed to suit the dietary needs of salmon at each life stage and improve feed digestibility – both of which significantly reduce waste.

REDUCING OUR RELIANCE ON FORAGE FISH

Canada leads the development of fishmeal and fish oil replacement in fish feed. In the 1990s, wild fish-based ingredients in feeds were as high as 80 per cent. Today, it's as low as 30 per cent.

MONITORING OUR ENVIRONMENTAL PERFORMANCE

Farmers conduct regular government-audited sediment testing of the ocean floor to ensure farms meet high environmental standards. The results are publicly available. Other steps that farmers take to protect the marine environment include:

- Completing site-specific environmental assessments before farming begins and each year of production
- Regularly monitoring water conditions
- Regularly following their farms between crops
- Conducting regular maintenance and inspection of net pens
- Training their staff to carefully monitor the environment and the health of their fish

FARMING FOR OUR FUTURE

More than half of the world's seafood comes from farms. Fish farming reduces pressure on wild fish stocks. As the world's population continues to grow, fish farming is the only way to provide the growing demand for healthy food.

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FISH FEED

AU NATUREL

No dyes, chemicals or growth hormones are added to the diet of farmed salmon

WHAT MAKES FARMED SALMON PINK?

Carotenoids – the same natural ingredients found in carrots and egg yolks – are added to their diet to provide them with vitamin A and give them their pink colour



CLOSED CONTAINMENT

NOT SO ENVIRONMENTALLY-FRIENDLY

Salmon farmers are experts in closed containment because our fish spend the first third of their lives in land-based hatcheries where recirculation is used. We know the amount of continuous electricity needed to run land-based facilities would leave a huge carbon footprint by producing harmful greenhouse gas emissions that contribute to global warming.

Closed systems require a consistent and abundant water supply at a time when many areas are facing water shortages. Huge amounts of water are needed to depurate salmon in closed systems prior to harvest.

Depurating the annual New Brunswick production of farmed Atlantic salmon would require the equivalent of diverting more than double the flow of the St. John River in “new” water from wells, streams or rivers.

Our industry has shown over the past 30 years we can grow Atlantic salmon in their natural environment with minimal risk to wild stocks or the marine habitat. Farmers use government-audited ocean floor sampling, underwater cameras and sophisticated feed management techniques to prevent waste and minimize potential environmental impacts to the ocean. Our production systems meet and exceed the stringent provincial and federal regulatory requirements for environmental and fish health standards.

NOT SO HEALTHY FOR OUR FISH

Closed systems result in cramped and stressed fish. A DFO study shows that to make closed containment marginally viable, farmers need to grow fish at a biomass of 50 kg/m³. Our fish are stocked at 15-17.

Atlantic salmon raised in net pens swim in their natural environment, contained by a system of nets, cages and mooring systems that are designed to meet the challenging environment of the east coast.

Our salmon take up less than four per cent of their pen at maximum, giving them plenty of room to follow their natural schooling instinct.

NOT SO COMMERCIALY VIABLE

A study led by the Canadian Science Advisory Secretariat examined 44 closed containment trials conducted throughout the world, including New Brunswick. All failed. To date, no closed system has successfully grown Atlantic salmon on a commercial scale. Further economic data showed only a four per cent return on equity after three years and return on investment would be two per cent.

WHAT DO FARMED SALMON EAT?

Farmed salmon eat nutrient-dense, dry pellets made from animal, plant and fish proteins of natural origin and essential vitamins and minerals.

All fish feed ingredients are approved for use by the Canada Food Inspection Agency.

Two important ingredients are fishmeal and fish oil, which ensure salmon contain high levels of omega-3 fatty acids that are good for your heart and mind. Fishmeal and fish oil primarily come from forage fish such as anchovies that are too small and bony to be eaten by humans. Our farmers source fishmeal from the byproducts of local fisheries when possible.

FEED CONVERSION CHAMPIONS

Farmed salmon are incredibly efficient when it comes to growth. Wild salmon eat 10 times their weight in smaller fish throughout their lives. For every kilogram of feed a farmed salmon eats, it gains almost a kilogram of weight.

A cow needs to eat eight kilograms of feed to put on one kilogram of weight and a pig needs to eat three kilograms of feed.

LEADING THE WAY IN RESEARCH AND INNOVATION

Managed by the International Fishmeal and Fish Oil Organization, forage fish are plentiful. But with salmon production expected to increase globally, farmers want to make sure the forage fishery remains strong.

Canada leads the development of fishmeal and fish oil replacement. In the 1990s, wild fish based ingredients in feeds were as high as 80 per cent. Today, it's as low as 30 per cent.

Atlantic Canadian feed producers work with top researchers to develop their own feed using local ingredients whenever possible.

Feed is tailored to suit the dietary needs of salmon at each life stage, which improves digestibility and results in less waste. Our farmers also use underwater cameras to prevent overfeeding and avoid waste. This supports environmental management practices.

DID YOU KNOW?

Developing land-based facilities for Atlantic Canada's salmon production would require about 8,500 football fields. Net pens need only a fraction of that space in the ocean.

The capital costs to move Atlantic Canada's salmon production to land would be at least \$1.5 billion.

There is no evidence that farmed salmon transfer disease to wild salmon.



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SOCIO-ECONOMIC BENEFITS OF SALMON FARMING

HOME GROWN INDUSTRY

Atlantic Canadian salmon farms are locally owned and operated.

Salmon farming employs over 3,000 people in our region and generates \$330 million dollars.

Farmed salmon is New Brunswick's biggest agriculture-based export and has the same potential in Nova Scotia.



AN UNPRECEDENTED OPPORTUNITY

- The amount of food that will be consumed in the world in the next 50 years will exceed ALL the food eaten in the rest of human history.
- One in five persons worldwide relies on fish for their primary source of protein.
- Each year there are 75 million more people to feed around the world.
- Global production of seafood is rising rapidly at a pace of seven to nine per cent each year.
- Salmon has now surpassed beef in world-wide consumption.

Aquaculture is crucial for supplying the world's food needs. No region in the world is better poised than Atlantic Canada to reap the benefits of aquaculture's potential and revitalize its rural, coastal communities.

BRINGING PROSPERITY TO ATLANTIC CANADA

The salmon farming industry is one of this region's biggest economic drivers. Our region produces 30 per cent of Canada's farmed salmon. The industry includes ocean farms, processing plants and hatcheries - supported by feed plants, cage and equipment manufacturers, research facilities, diving, maintenance and transportation services creating thousands of spin-off jobs.

STRENGTHENING RURAL COMMUNITIES

Salmon farming is transforming coastal, rural communities from areas of high unemployment to relative prosperity. Over 90 per cent of the jobs in our industry are full-time. Seven per cent are part-time and only three per cent are seasonal. Salmon farmers are part of an integrated working waterfront that includes the traditional fishery, tourism and recreation. They make a significant contribution to the social fabric of their communities.

KEEPING OUR YOUNG PEOPLE AT HOME

We're building an industry that will keep our young people at home by offering them challenging, full-time work in their own communities. Over 50 per cent of direct industry jobs are held by individuals under the age of 40, and this employment stability means that fewer young people must leave our region in search of work.



INTEGRATED PEST MANAGEMENT FOR SEA LICE

A BALANCED AND EFFECTIVE APPROACH

Integrated Pest Management (IPM) is a strategic approach to sea lice that combines preventative farming practises like fish husbandry, fallowing and low stocking densities with approved treatments when necessary.

Avoiding sea lice treatment is the top priority of Atlantic salmon farmers, but sometimes our fish need to be treated by a veterinarian because some fish can become stressed by sea lice making them vulnerable to disease. Veterinarians use only approved products under the oversight of government regulators.

Under an IPM strategy, farmers would have access to a variety of approved products to use based on the life stage of the louse and on other factors like water temperature. That would mean farmers could use the right treatment at the right time, thus reducing the overall amount of approved product used.

Farmers in Chile, Scotland and Norway have had access to a variety of approved products for many years.

COMMITTED TO PROTECTING OUR OCEANS

All sea lice treatment products undergo extensive risk assessments by Health Canada to ensure they are safe for salmon and other species, the environment and human health.

Extensive scientific field research and monitoring have shown that approved products have no negative impact on the marine system, on lobster or other species when used according to treatment protocols.

Working with researchers and government officials, farmers monitor sea lice at all farms. They work with top scientists and regulators to collaborate on research and monitoring projects and share information with fisheries groups and the community.

INVESTING IN "GREEN" TECHNOLOGIES

Atlantic salmon farmers are investing millions of dollars into the research and development of alternative "green" sea lice technologies like well-boats, sea lice traps, and "cleaner" fish.

WHAT ARE SEA LICE?

Sea lice occur naturally in the ocean and live on many species of wild fish including salmon. They do not pose a human health risk.

Farmed salmon go into the water free of sea lice.

Not all salmon farms have sea lice. No sea lice treatments have been necessary in Nova Scotia for over 20 years.



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QUALITY AND SAFETY

NATURALLY HEALTHY

Salmon is one of the world's best sources of heart-healthy omega-3 fatty acids.

Eating omega-3 rich seafood like salmon can reduce the risk of coronary death by 36 per cent and increase life expectancy by 2.2 years.

There are no dyes or growth hormones in farmed salmon.

Farmed salmon is not genetically modified.



ONE OF THE HEALTHIEST FOODS IN THE WORLD

Atlantic salmon is one of the most nutritious foods you can eat. It's high in protein, low in saturated fat and loaded with vitamin D and E.

Eating farmed salmon can help prevent heart disease, lower cholesterol and blood pressure, boost your brain function and reduce the risk of cancer, stroke, depression, Alzheimer's disease, arthritis, Crohn's disease and asthma.

Fish consumption has been associated strongly with a lower risk of heart disease. If Canadians increased their consumption of fish to Canada Food Guide recommended levels, 5,800 lives could be saved per year.

A SAFE FOOD CHOICE

Atlantic salmon is fresh and safe. Farmed salmon are not dyed pink or injected with growth hormones or genetically modified.

Carotenoids – the same natural ingredients found in carrots and egg yolks – are added to the diet of salmon to provide them with vitamin A and give them their pink colour.

Antibiotics are not often used at salmon farms but if needed, they are used only under a veterinarian's direction. Less than three per cent of the feed given to farmed salmon contains an antibiotic. Antibiotic use on salmon farms is far lower than any other agricultural animal-producing industry. Strictly regulated withdrawal periods - far longer than any other agriculture sector - follow any use of medication. A regulated testing program ensures that no residues remain in salmon when harvested.

Trace amounts of contaminants like PCBs are in the environment and found in most foods we eat. Salmon has significantly lower levels than other foods such as butter, beef, chicken, pork, canned tuna and eggs. But levels found in all fall well below safety thresholds set by the Canadian Food Inspection Agency.

The enormous health benefits of omega-3 rich seafood outweigh any potential risks by at least 300:1 according to one Harvard researcher.

TRACED FROM EGG TO PLATE

Atlantic salmon farmers document their fish from eggs in hatcheries, to their ocean pens, through processing and distribution to ensure the safe handling every step of the way.



VIBRANT AND DIVERSIFIED COMMUNITIES

PARTNERS IN A WORKING WATERFRONT

Coastal communities benefit from a diversified economic base that includes salmon farming, traditional fisheries, recreational fishery and tourism. Salmon farming has successfully co-existed with a thriving wild fishery and a vibrant tourism industry for over 30 years in Atlantic Canada and elsewhere.

Our region's salmon farmers are passionate and hardworking people who are committed to building a locally based, globally competitive and environmentally sustainable industry that will continue to bring prosperity to our coastal communities. They are committed to making sure that traditional fisheries and aquaculture continue to thrive as partners in our region's working waterfronts.

NOT TO BLAME FOR WILD SALMON DECLINE

Salmon farming began because the commercial fishery for Atlantic salmon was in decline. Studies and monitoring data show wild salmon populations fluctuate in areas with and without salmon farms.

Wild salmon in the Bay of Fundy are impacted by a variety of issues such as acid rain, seal predation, unhealthy watersheds, hydro dams, habitat loss, invasive species and over-fishing. Environmental assessments show that salmon farms do not pose a significant or permanent risk to wild salmon or habitat.

LOBSTER LANDINGS GROW

Lobster landings have increased since the 1990s according to the Department of Fisheries and Oceans. A study conducted by the School of Fisheries, Marine Institute of Memorial University in 2005 showed that after 25 years of commercial fish farming, lobster landings are at historic high levels particularly in areas with active fish and shellfish farm sites.

TOURISM ENHANCED

In most coastal communities, salmon farmers work alongside tourism operators. Many visitors to our shores and communities are interested in learning more about salmon farming. Tourism industries will flourish when visitors can be drawn to a community because there is a variety of experiences available to them.

SAFE FOR OUR OCEAN

Lobster landings have increased in many areas where salmon farming also thrives.

There is no credible evidence that farmed salmon transfer disease to wild salmon.

Wild salmon runs fluctuate from year to year whether salmon farms are in the area or not.



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**Farmed salmon: Good for you.
Good for your community.**

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