



Aquaculture Industry in Atlantic Canada

With its four provinces representing over 40,000 kilometres of coastline, Atlantic Canada accounts for the vast majority of Canada's rich variety of harvested, farmed and processed fisheries products exported worldwide. A skilled workforce, and established post-secondary training programs assist the industry's management and technology needs.

The aquaculture industry in Atlantic Canada is a dynamic system of food production that is driven by producers of salmon, mussels and oysters. It is supported by world-class research and development facilities, suppliers that manufacture everything from cages to automatic feeding systems, industry associations that provide a strong voice for the industry, as well as governments that recognize the value of the industry and work together with key stakeholders to promote opportunities for growth.

CHARACTERISTICS

From 1998 to 2004, the total value of aquaculture production in Atlantic Canada increased from \$166 million to \$255 million. Over this same period, the volume of production has increased from 21,000 tonnes to 69,000 tonnes.

The following illustrates some of the many opportunities the Atlantic Canadian aquaculture industry is currently developing:

- In 2004, farmed Atlantic salmon accounted for slightly more than 50% of total aquaculture production volume in Atlantic Canada and 70% of total production value in the region. The product value of farmed salmon from Atlantic Canada grew 45% from 1998 to 2004.
- In 2004, mussels accounted for 33% of volume and 13% of value in aquaculture production.
- New Brunswick plays a key role in Atlantic Canada's aquaculture industry. The province's total value of production increased substantially from \$115 million in 1998 to \$181 million in 2004.
- The rate of growth has been most pronounced in Newfoundland and Labrador, where production value grew from just over \$11 million in 1998 to more than \$22 million in 2004.
- Growth was also evident in Nova Scotia, where the value of shellfish production went from just over \$3 million in 1998 to \$10 million in 2004.
- Aquaculture in Prince Edward Island grew at an impressive rate, with the total value of production increasing from \$20 million in 1998 to \$33 million in 2004.

Atlantic Canada is a leader in aquaculture. Because of the region's competitive business costs and distribution networks, its aquaculture products are exported mainly to the United States. The industry also benefits from a skilled workforce, sophisticated infrastructure and innovative approaches to technology and processes.

With almost 69,000 tonnes of total production and sales exceeding more than \$255 million in 2004 the aquaculture industry is thriving in Atlantic Canada. The region employs more than 3,000 professionals within the industry and houses over 200 active farms.

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HEALTH BENEFITS OF FARMED FISH AND SEAFOOD

Government institutions and independent health experts around the world recognize farmed salmon as a safe and nutritious food product.

- Salmon is identified as a nutritious source of food protein, with positive health effects associated with high levels of omega-3 fatty acids.
- Regular consumption of salmon has been shown to reduce rates of heart disease, stroke, high blood pressure, depression, Alzheimer's and childhood asthma, among other conditions.

Mussels, oysters, scallops and clams are also recognized as healthy sources of protein. They are readily available year round and are easy to prepare. Some health and nutrition facts about shellfish:

- Mussels have almost the same protein content pound-for-pound as beef, but only one-quarter the calories.
- Shellfish are typically high in protein and iron, and very low in calories, fat and cholesterol.
- Oysters contain dopamine, which is a vital element that governs brain activity.

BUSINESS ENVIRONMENT

COST STRUCTURE

According to KPMG's 2006 guide to international business costs, Atlantic Canada is one of the most cost competitive regions in the world for doing business. With numerous research and development tax incentives, a cost of living 25 to 65 percent lower than other major regions in North America, and the lowest costs for labour and electricity in North America, Atlantic Canada offers many benefits for international firms.

COMPARATIVE BUSINESS COSTS INDEX *

OVERALL RESULTS

YOKOHAMA, JAPAN	108.3	ATLANTIC CANADA	CHARLOTTETOWN, PE	91.7
NAPLES, ITALY	96.7		HALIFAX, NS	92.2
BOSTON, MA	107.8		MONCTON, NB	91.1
NEWARK, NJ	107.7		ST. JOHN'S, NL	94.3
PORTLAND, OR	100.5		SYDNEY, NS	92.2
PROVIDENCE, RI	102.4		TRURO, NS	89.4
TAMPA, FL	96.5		PICTOU, NS	89.9

source: Competitive Alternatives: KPMG's guide to international business costs, 2006 Edition.

* Business costs are expressed as an index, with the United States being assigned the baseline index of 100.0. A cost of less than 100 indicates lower costs than those in the U.S. A cost index of greater than 100 indicates higher costs than those in the U.S.

MARKET THRUST

Exports from Atlantic Canada's aquaculture industry represented \$153 million in 2005. More than 90% of aquaculture production is exported to the United States and primarily to Massachusetts, Maine, New York, Connecticut and New Jersey. Aquaculture producers in Atlantic Canada have a significant competitive advantage in quick and direct access to the North Eastern United States market and, consequently there has been an almost 30% increase in exportation value from \$119 million in 2003 to the current 2005 level.

INDUSTRY LEADERSHIP

Atlantic Canada is experiencing strong growth in the salmon aquaculture sector. Leading the pack is New Brunswick's Bay of Fundy region – an ideal environment for aquaculture and home

to approximately 90 salmon farms. Three-quarters of its production is exported to the United States.

The last decade has seen the number of aquaculture farms throughout the region more than double and production continues to increase. The province's aquaculture industry is also becoming more diversified with the farming of other finfish as well as shellfish.

Cooke Aquaculture Inc

(St. George, NB) represents one of the dynamic firms in the region whose operations throughout Atlantic Canada have grown to include hatcheries, marine cage sites, vaccination services and net repair, as well as processing facilities. While the company's primary focus has been on Atlantic salmon and increasing the percentage of value added products, the management team is also looking to other species and in

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early 2006, in a Canadian first, Cooke Aquaculture brought cod to market. It's no wonder Cooke received recognition as one of the 50 best managed companies in Canada in 2005

On Prince Edward Island, almost 21,000 tonnes of mussels and oysters were produced in 2004. The province is home to 77% of Canada's farmed mussel production. Prince Edward Island firms are also developing leading-edge fish processing technologies such as modified atmosphere packaging (MAP), which enhances convenience, consistency, food safety and visual appeal.

Canadian Mussels Ltd.

(Montague, PE) is North America's most innovative supplier of high quality blue mussels to domestic and international food service and retail markets. The breadth and depth of the company's products is unmatched in the industry and encompasses all types of value added mussels including the revolutionary modified atmospheric fresh pack. With an annual supply of over 5,000 tons of mussels, Canadian Mussels Ltd.'s products are served in fine-dining restaurants and are available in retail supermarkets throughout Canada, the United States and Europe.

Newfoundland and Labrador's aquaculture industry includes salmon, cod, mussels and steelhead trout. There is an abundance of sites with particular natural advantages for aquaculture. Opportunities exist for new investment in salmon production, in the mussels sector, and the stocking of cod juveniles for commercial cod hatcheries.

The industry in Nova Scotia is diversifying at an ever-increasing rate. In addition to the more traditional species of Atlantic salmon, steelhead trout, halibut, mussels, oysters, and scallops, operators are also farming quahogs, seaweeds and clams. The expanding nature of the provincial industry is manifested in the number of sites in Nova Scotia, which now exceed 370 in total.

RESEARCH AND DEVELOPMENT

Atlantic Canada is responding to existing and new market opportunities by developing better and more cost-effective husbandry processing, packaging and shipping techniques, all the while adapting to ecological and environmental concerns. The region's university and private sector research facilities work in partnership to provide research and development assistance for aquaculture in Atlantic Canada.

Research and Productivity Council of New Brunswick (Fredericton, NB)

conducts a wide range of research including fish pathogen diagnostic technique development and application, fish disease treatment strategies, genetic management of fish stocks, policy and program development, value-added product development, and quality assurance.

The Ocean Sciences Centre

(St. John's, NL) contains a state-of-the-art aquaculture research and development facility which supports training, pre-commercial production, and small-scale commercial trials on alternative species for marine aquaculture. It was designed and built to serve as an incubator for companies working to develop marine aquaculture techniques.

National Research Council's Institute for Marine Bioscience

(Halifax, NS) focuses on the growth and diversification of Canada's finfish, shellfish and seaweed aquaculture industries. The Institute's accomplishments in reproduction, husbandry, animal health and nutrition, and the detection and identification of marine toxins are recognized worldwide.

Canadian Centre for Fisheries

Innovation (St. John's, NL) provides the fishing industry with the tools of scientific research and technology. Using the resources of Memorial University of Newfoundland, the Centre offers expert assistance in aquaculture, harvesting, and processing in order to increase and enhance clients' productivity and profitability.

Canada is the world's fourth-largest producer of farmed salmon after Norway, Chile and the United Kingdom.

INDUSTRY ASSOCIATIONS

- New Brunswick Salmon Growers Association
- Professional Shellfish Growers Association of New Brunswick
- Newfoundland Aquaculture Industry Association
- Nova Scotia Aquaculture Industry Association
- Prince Edward Island Aquaculture Industry Alliance

RECENT INNOVATIONS IN ATLANTIC CANADA'S AQUACULTURE INDUSTRY

- Experimental and commercial advancements involving a number of alternative shellfish and fish species.
- Portion-controlled packs for the food services industry.
- Feeding formulas and automatic moist feed delivery systems.



PROVINCES AND ABBREVIATIONS

- NB** - NEW BRUNSWICK
PE - PRINCE EDWARD ISLAND
NS - NOVA SCOTIA
NL - NEWFOUNDLAND AND LABRADOR

If you would like more information on this sector, please contact:

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ATLANTIC COD GENOMICS AND BROODSTOCK DEVELOPMENT PROJECT

The Huntsman Marine Science Centre (St. Andrews, NB) and the **Genome Atlantic's DNA Sequencing Centre** (Halifax, NS) are collaborating on a \$13 million research project to develop a success model for cod breeding.

This project is applying genomics technologies combined with family-based selective breeding methodologies to identify cod with traits of commercial importance, such as improved growth, delayed age of sexual maturation and resistance to disease and stress. The project will sequence genes in order to identify molecular markers that are associated with superior performance under farming conditions.

TRAINING AND EDUCATION

Numerous institutions and centres in Atlantic Canada work towards the creation of a strong and knowledgeable workforce within the aquaculture industry. With the collaboration of research and development centres, Atlantic Canada's academic and private sector training and education centres offer extensive hands-on experience.

University of Prince Edward Island

(Charlottetown, PE), home to the Atlantic Veterinary College has been established as a learning institution, research centre and service provider with expertise in aquaculture and fish health. It offers students the opportunity to gain knowledge and hands-on experience within this sector.

Nova Scotia Agricultural College

(Truro, NS) offers a four-year undergraduate degree in Aquaculture and a Masters of Science in Aquaculture in affiliation with **Dalhousie University** (Halifax, NS). Its aquaculture centre includes labs, and modern holding and research facilities. It also houses one of the most sophisticated water recirculating systems in Canada.

AQUACULTURE IN ACTION

With an abundant opportunity for growth within the aquaculture industry, Atlantic Canadian firms and organizations recognize the potential for growth in the following areas.

- Marine finfish species such as cod, halibut and haddock.
- Shellfish aquaculture, including blue mussels and various other shellfish species, such as scallops, clams, oysters and quahogs.
- Open ocean technologies to allow for further expansion of salmon farming in the Bay of Fundy.



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