

Natural assets

In Nova Scotia, life sciences companies act locally and compete globally

by TOM MASON

The health benefits of fish oils have been known, anecdotally at least, for generations. Many European and North American baby boomers remember choking down daily spoonfuls of cod liver oil as schoolchildren. What is now proven scientifically is that the long chain molecules known as fatty acids found in fish appear to account for the low rate of cardiovascular disease in Inuit populations in Northern Canada and Greenland. Recent studies also suggest that a regular dose of omega-3s can improve blood circulation, lower blood pressure and triglyceride levels, reduce the risk of heart attack, and even slow the growth of certain cancers. Today “functional foods” sold around the world contain omega-3s as an additive in everything from daily vitamin supplements to breakfast cereal, bagels, orange juice, and eggs. The trend is a lucrative one for Nova Scotia-based Ocean Nutrition Canada (ONC), which is a world leader in functional food formulations using omega-3s.

ONC started as a research-and-development offshoot of seafood giant Clearwater

Fine Foods, with a mission to find ways of using waste streams created by the fishing industry. Over the past 15 years, it has become the world’s largest producer of fish-oil-derived omega-3s, with more than 350 employees around the world. The company forms strategic partnerships with retail giants such as Loblaw’s and Walmart to supply them with purified omega-3 ingredients for branded omega-3-fortified products. “Think of us as the ‘Intel inside’ your computer,” says ONC chair and co-founder Robert Orr.

ONC relies on the anchovy fishery in Peru for its main source of raw fish oil. From the local market instead it harvests something else: the scientific talent that is vital to the company’s competitiveness. “The marine science community that exists here in Halifax has been instrumental for our business,” says Orr. “A company like ours can accomplish a lot by leveraging the capability of universities like Dalhousie and by using all the other R&D resources available in this province.”

It’s a sentiment shared by many in the life sciences community. Bolstered by a network that includes 11 universities, the



region's largest research hospital, and world-class federal research facilities such as the Bedford Institute of Oceanography, Nova Scotia has become a viable centre for the biotechnology industry. BioNova, the province's industry association, represents 50 companies and more than 3,400 people; those organizations are achieving success by forming partnerships, creating new markets and products, and focusing on state-of-the-art research to stay ahead of the competition.

"For example, we spend more money on research and development than our next four competitors combined," says Orr. "The se-

cret to our success is developing proprietary technology that allows us to create a higher-quality product at lower costs."

RESPONSIVENESS

This is a winning blueprint that Dartmouth-based Precision Biologic knows well. With just 60 employees, the company is a relatively small player in the highly specialized field of blood-coagulant testing kits. It stays competitive by focusing on what it does well and forms partnerships, working with major medical labs throughout the United States and Canada, sharing resources and R&D acumen. It sells three-quarters of the

products it produces back to hospitals in the U.S., building a loyal customer base by cultivating a reputation for responsiveness.

"There's no way we can compete by copying what our competitors do. They're just too big," says chair Michael Scott. "We follow a policy of 'customer listening.' We don't assume that we know what our customers want. We ask them what their needs are, what they don't like about current testing kits, what frustrates them. As a result, we have a very good collaborative relationship with them. As a small company, responsiveness is our biggest asset."

While Scott admits that Nova Scotia



Ocean Nutrition Canada



Precision Biologic

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— Michael Scott, Precision Biologic

seems an unlikely place for a medical supply company that does the bulk of its business in the United States, he says the business climate in the Halifax area is ideal for biotechnology firms. “Dalhousie University and the QEII Health Sciences Centre are important components for us, and the National Research Council has been very helpful in solving problems,” he says. “And there’s a real quality to the workforce here—people are committed, engaged, loyal. That’s a huge asset for us.”

INNOVATION PORTFOLIO

Another unique fish in the Nova Scotia life sciences pond is Acadian Seaplants. The company has evolved over the last 30 years to become the largest producer of seaweed-based specialty products in the world by turning a variety of seaweeds into value-added products such as fertilizers, animal feed additives, and beauty and food ingredients—40,000 tons of seaweed that grosses more than \$30 million in sales.

To accomplish that, the company has marshalled an impressive portfolio of hu-

man resources, technological innovation, and resource stewardship. Acadian Seaplants has invented new technologies and processes and created new products and markets, carving out an industry where none existed before. By the time its products arrive into the hands of customers, the innovative Nova Scotia-based company has added value in every possible way.

One of the company’s flagship products is called Han-Tsunomata, a popular salad seaweed in rich pink, green, and yellow hues that is destined for the Japanese market. It’s grown in a huge network of rectangular tanks covering several acres of land in Charlesville, at the mouth of Pubnico Harbour in Nova Scotia’s Shelburne County. It’s something of a technical marvel; it’s the largest commercial seaweed-cultivation facility on land in the world. With seaweed comprising about 15% of the Japanese diet, growing it has always been big business. But until the Charlesville operation opened, most salad-grade seaweed came from farms located right in the ocean. The facility gives Acadian Seaplants a capability



—Acadian Seaplants

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unique in the world: the ability to carefully control the conditions under which seaweed grows. "We can do things here that you just can't do in the ocean because you can't control the ocean," says president J.P. Deveau. "In the ocean, you can't feed the plants. We can feed them in a way that brings out those characteristics that our

customers are looking for. It's an intensive system that requires a tremendous amount of science and technology to manage."

Much of the innovation happens in a converted naval base in Annapolis County now known as the Dr. James S. Craigie Research Centre. A team of researchers that include nine PhD-level scientists conduct testing of everything from the growth rate of potted plants infused with seaweed fertilizer to the best way to grow nori. It's

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ATTRACTING TALENT

Recruiting and retaining top research scientists

a facility that would do most universities proud: a series of labs packed with state-of-the-art equipment. The company invests between 5% and 10% of annual revenue on research and development and partners with research institutions such as Dalhousie and Acadia universities, the Nova Scotia Agricultural College, and the National Research Council.

Research and development is the key, but it is the opportunities of a global marketplace that keep Nova Scotia's life sciences companies focused and energized. "We knew from the beginning there wasn't going to be a substantial market for our products in Atlantic Canada and we would have to go search the world," says Deveau. He hit on one novel marketing solution a few years ago by offering jobs to foreign students studying in Atlantic Canadian universities, young business grads who wanted to continue to live and work in Canada but who knew intimately the language, the culture, and the customs of their native countries. Today the company is also hiring people located within the export countries to address customer needs in its target markets.

As the world becomes more and more aware of the potential health benefits of omega-3s, Ocean Nutrition Canada continues to look for green markets and new partners. "We're a Canadian company, but our future depends on being a global company," says Robert Orr. "We're working on opening up new markets in Europe, where they're just starting to become aware of omega-3s. We're looking at China as a significant market in the future and also South America. The functional food market is still very much in its infancy, and there are a lot of opportunities out there for us. We've only just begun to scratch the surface." ■

Balakrishnan Prithiviraj is an expert microbe interactions and the effects of marine bioproducts on plants and animals, with several industrial patents and more than 70 published papers in some of the world's most prestigious science journals to his credit. The Indian-born scientist came to Canada in 2005 to become a professor at the Nova Scotia Agricultural College (NSAC) in Truro, but it was equally the opportunity to work with an innovative private company that lured him away from a successful research position at Colorado State University.

Today Prithiviraj spends much of his time conducting research for Acadian Seaplants Ltd. (ASL), unravelling the benefits of seaweed to plants and animals. He spends the rest of his workweek teaching at NSAC. It's a unique arrangement. "I don't know of any other place in the world where you could work closely with a private industry and teach at a university at the same time," he says.

Recruiting scientific talent is essential for Nova Scotia's biotechnology companies; their success depends on R&D in order to stay competitive and develop new products and revenue streams. "We've always attempted to attract the best people in our industry, and we've been very successful," says Acadian Seaplants president J.P. Deveau. "There's no question that scientists are attracted to opportunities in our company. They realize it's a chance to be part of a major player in a global industry—a player that's going somewhere."

Acadian Seaplants started the trend more than 15 years ago by recruiting Dr. Raul Ugarte, a Chilean scientist who studied at Dalhousie University; it was the company's first big recruiting coup. Today Ugarte manages the harvesting and environmental stewardship of Acadian Seaplants' vast 3,000-kilometre stretch of coastal resource leases in Atlantic Canada and Maine. British native Dr. Alan Critchley, one of the foremost commercial seaweed experts in the world, was recruited from a major institution in France to become ASL's vice-president of research. Critchley says he was attracted to the chance to work with one of the most scientifically advanced commercial seaweed producers in the world, and state-of-the-art facilities such as the Charlesville land production were the main bait.

"There's a real breadth of things that we do in the seaweed world that's very attractive to people who are interested in that," says Deveau. "It's a very narrow field, and the people who work in it tend to know who we are."

But scouring the world for experts is just one part of the equation. At Ocean Nutrition Canada, most of the company's 50 full-time researchers were recruited from universities right in Nova Scotia. "We've got 13 PhDs on staff, and some of them are highly specialized," says ONC chair and co-founder Robert Orr. "When we need a world-class expert in an extremely narrow field like microencapsulation or lipid chemistry, sometimes we have no choice but to recruit internationally. But Nova Scotia universities are producing some outstanding research talent in specialist areas like at the Dalhousie Department of Oceanography. They are a key resource for us, and a big part of the reason why Nova Scotia is such an important place for us to be." —T.M.