



THIS IS BIOTECH

BEYOND MOOSE AND MOUNTAINS: BUILDING CANADA'S BIO-BASED ECONOMY.



Growing and Harvesting Canada's Newest Crop from the Sea

Canadian Pacific Algae Inc., Nanaimo, BC

What's green, ordinarily grows in the ocean, is good for you and could become the Arctic's first year-round crop? If you answered algae, you're either a marine biologist or working for Canadian Pacific Algae. Either way, you're definitely smarter than a fifth grader.

Algae is not only the basis of the marine food chain, it is also one of nature's most nutritious foods and, with a little help, has the remarkable ability to grow in icy Arctic waters year round. It's this little bit of help that biotechnology company Canadian Pacific Algae is perfecting in its algae-plant in Nanaimo, BC.

Why grow algae, also known as phytoplankton, on land when seventy percent of the world's surface is covered in seawater, which is the natural home of marine algae? It all boils down to efficiency and the environment, says Mike Withrow, vice president of Canadian Pacific Algae. This means taking what nature has spread across trillions of liters of ocean water and growing it in extreme concentrations in million-litre vats at the company's algae plant.

The algae-growing facility is comprised of eight 1,000,000-liter tanks containing pristine ocean water piped in three kilometers off Canada's North West Pacific coast. The cold ocean water naturally contains roughly 300 phytoplankton per millilitre, says Withrow, but after applying Canadian Pacific Algae's technology, the concentration of good-for-you phytoplankton explodes to an estimated 3,000,000 per milliliter.

The company is capable of producing 10 tons of algae on a regular 11-day cycle all year long, on a piece of land that's less than the size of a football field. "We can run our entire facility on a 45-horsepower footprint," says Withrow.

When this marine algae is grown in high concentration and harvested, the resulting product contains most, if not all the minerals, trace elements and essential fatty acids that all living things need for healthy functioning. It's nature's super food with the added benefit of being sustainable and removing 22 tonnes of CO₂ per acre daily from the atmosphere while returning oxygen to the environment, says Withrow. The company is one of the few manufacturing operations that can be said to have a positive impact on the environment.



The deeply hued algae is harvested after the "spring bloom" and processed into a dehydrated form or concentrated liquid that the company intends to serve as a potent feed additive to improve the health of livestock and poultry. With algae's known health benefits, the algae may reduce the need for animal antibiotics, already banned in the European Union, says Withrow.

But algae can improve more than just the health of livestock. Canadian Pacific Algae grows and sells the propriety mix of phytoplankton in massive quantities as important ingredients in the burgeoning market of nutraceuticals as well as cosmetics, skin care, functional foods, beverages and alternative health products. The company recently commenced human trials to confirm their algae's medicinal properties, at the Richardson Centre for Functional Foods and Nutraceuticals, University of Manitoba.

What makes their algae unique compared to competitors is that the company grows a sustainable crop through their multi-species mix instead of what's typically a single algae species, which makes their harvest richer in the sought-after nutrients, vitamins and minerals. Remarkably, the company has shown it can grow algae blooms in ice-covered water at temperatures below 0°C. This extreme low temperature growth means that giant rafts of algae can be grown as far as the Arctic Circle throughout the year, making it potentially Canada's most northerly sustainable crop.

For most people, algae may be simple green scum, but for Canadian Pacific Algae Inc. and Canada it's pure green gold.