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Floating Contained Aquaculture

A Canadian company has developed a new self-contained floating finfish farming system, currently slated for testing in China. Photo courtesy of Agrimarine.

A new entirely self-contained floating finfish farming system, built by a Canadian research and development outfit, has opened the door to year-round salmon farming in China. The system quickly drew the attention of Fairchild Capital Management, a Vancouver venture capital firm, when it was unveiled at the China Fisheries & Seafood Expo, Nov. 3-5.

"We've built closed containment rearing technology and built our first commercial plant in China," said Richard Buchanan, CEO of Agrimarine Holdings, Inc., Nov. 5. The Vancouver, British Columbia-based company built its first commercial farm near Shenyang, in southern Liaoning Province, an easy overnight drive from Bejing and its 13 million fish-loving residents.

First harvests of rainbow trout and salmon from the Chinese facility are expected in late summer 2010. Agrimarine is also raising Chinook salmon in a demonstration unit it built near Campbell River, B.C. with first harvest also expected next year. "We're growing fish, selling it into the market like everybody else," Buchanan said.

Contracted by the British Columbian government in 2000 to find a fix to escape, disease and pollution problems common to traditional net pen farms, Agrimarine developed a self-contained package that includes 12 tanks, each 24-meters in diameter and 20 feet deep. Circulating water that is completely replaced every hour provides a semblance of ocean currents that improves flesh quality while removing fecal matter and unconsumed feed.

"In the circulation tank the motion acts like a big toilet and removes the waste," Buchanan said. Waste material is recycled for compost.

The floor of each unit is also fitted with video cameras that allow for more efficient feed use, according to Buchanan. "When (feed) pellets are seen falling through you know feeding is done. You know the fish are full," he said.

Based on limited publicly available information from what Buchanan said are largely Norwegian-owned net pen salmon farms in B.C., he projected a ten percent savings in feed costs. "The data from net cages is closely guarded by the Norwegians. We're going on public data the government gets from the Norwegians," he said. Feed conversion ratio is estimated at 1.3, Buchanan added.

Agrimarine began its research with a target cost cap of $750,000 per unit, based on a 25-year amortization per tank, more than twice the life of standard net pens, which Buchanan said last 12 years. The final product cost is $200,000 per unit, including monitoring, circulation and oxygenation equipment.

Each unit is constructed from 24 pie-slice sections held together with stainless steel bolts. The 12-tank packages include framed in catwalks of varying height depending on whether they are used in lakes, where they may need protection from ice, or oceans with higher waves.

"We're going to do salmon in the Yellow Sea," Buchanan noted. His company is looking at four properties in China with plans for two each for salmon in cold-water regions and two for yellow fin tuna in warmer seas.

"I think it's evolutionary. It was apparent from a business strategy we could build it in China. The Chinese government has given us a great opportunity," he said.

A self-contained farm was always the primary goal, but research that began in 2000 focused on a land-based, 50-foot diameter, concrete tank system thought best to address circulation and waste control. Concrete turned out to be

an almost perfectly wrong construction material. It was porous enough to allow kelp to grow, which shed and plugged drains and coarse enough to damage salmon that brushed against its surface.

By 2004 it became obvious that larger tanks were needed for cost efficiency and that floating tanks were more practical. Concrete tanks with aluminum liners were found to be too heavy. Aluminum tanks, with steel reinforcement bands, were too flexible and subject to corrosion.

Agrimarine also experimented with icebreaker and space ship technology before finding that it could use the same material used to build the blades of wind generators; layered fiberglass and foam infused with resin.

Buchanan said Canadian First Nations tribes that have been critical of net pen farms because of pollution and disease problems that threaten wild salmon stocks have "embraced" the new technology for its sustainability and the jobs they expect it to produce in seafood processing plants.

Buchanan said a 12-tank unit can be operated by a crew of about 12 people and because it doesn't rely on ocean currents to remove pollution can be located closer to processing plants and markets.

Buchanan also attended China's first seafood sustainability forum, Nov. 2, to promote his product and connect with certification organizations in order to gain their market advantage.

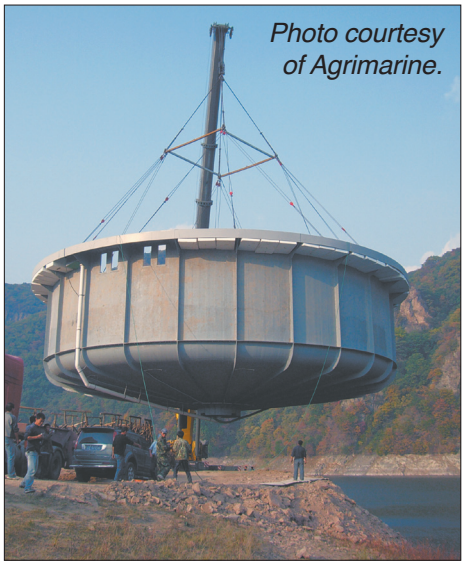
Photo courtesy of Agrimarine.

"We have to somehow brand our product, our fish, to distinguish it in the market from fish that's not sustainable," he said.

"It's a small step in recognizing sustainable foods (and) food production but for us it's how we get our message to the consumer, that our product, our technology is sustainable and distinguish it from all the other food that is in the market place," Buchanan added.

To date Agrimarine has found little interest from existing B.C. salmon farmers, but Buchanan is confident they and other net pen users will change. "The industry is now starting to see around the world, particularly in Chile, that it's bad," he said with reference to the disease-driven collapse of Chilean Atlantic salmon farms.

"I think eventually the net cage guys will come around and see this is cheaper and supported by the consumers," Buchanan said.

Joseph Fung, managing partner of Fairchild Capital Management, declined to disclose his company's plans regarding Agrimarine Holding or its Chinese subsidiary, Benxi AgriMarine Industries, Inc.

"Richard's technology is in a good position... We can't say how we want to be involved. We're doing due diligence now," Fung said, Nov. 5.