



Researcher Thierry Chopin at an IMTA site located in the Bay of Fundy, Canada.

# Balancing act

Salmon farming shows eco-gains, but gap remains

By Lisa Duchene

An unlikely salmon-farming scenario is under way in Washington state. Producer AquaSeed grows Pacific coho from egg to plate that have never touched the ocean. The fish are about 3 to 4 pounds each, marketed under the SweetSpring brand and grown on land in freshwater tanks. The company this year sold about 250,000 pounds to a Canadian supermarket and to Microsoft's corporate food-service operation, operated by The Compass Group.

AquaSeed's SweetSpring Coho-brand is the only farmed salmon not red-listed and to have earned a best choice ranking by the Monterey Bay

Aquarium's Seafood Watch program. The cohos are "super green," meaning they have low levels of contaminants and high levels of omega-3 fatty acids.

SweetSpring salmon represents the cutting edge of technological innovation toward sustainable salmon farming. Government, buyers, producers and NGOs are all driving innovation in new production methods as well as environmental improvements in net-pen use. Performance standards, the culmination of the six-year effort of the World Wildlife Fund Aquaculture Dialogues, are on the horizon.

"There's been huge work on closed containment in the last few years," says Jay Ritchlin, director for marine and freshwater conservation at the David Suzuki Foundation in Vancouver, British Columbia, Canada. Ritchlin represents the Coastal Alliance for Aquaculture Reform (CAAR), of which the Suzuki Foundation is a member, on the steering committee of the WWF Aquaculture Dialogues.

"[Development of closed-containment technology has] gone from a 'You've got to be kidding,' to 'OK, let's put some real projects in and make a go of it.'"

There are also closed-containment system projects in the works at AgriMarine and Marine Harvest Canada.

AgriMarine Holdings, also in Vancouver, is a developer of

floating closed-containment technology for sustainable aquaculture. The company in late September announced that it started installing a floating, closed-containment tank in the Campbell River in British Columbia, and the first steelhead trout harvest from the first such tank in China's Guanmenshan Reservoir, which was stocked in September 2009.

Marine Harvest, which produces 25 percent of the world's farmed salmon supply, plans a joint project with CAAR to test the technology in British Columbia, says Petter Arnesen, Marine Harvest's VP of feed and environment.

Arnesen does not share many environmentalists' view of closed-containment technology as a potential "silver bullet solution."

Today's closed-containment technology falls far short in scale, he says. There is much to learn about closed containment and many issues such as land capacity and carbon footprint, he says. "I believe that the future holds a mix of production technologies," says Arnesen, and closed containment could make up some small portion of that mix.

Conventional, net-pen salmon farming has also reduced its environmental impact.

Ritchlin credits the farmed-salmon industry with improvements in salmon feed efficiency, reduction of antibiotic use in Norwegian farmed salmon, and bay area management at farm sites in New Brunswick, Canada.

Innovation in the industry is being driven by stricter regulations governing salmon farming, economics and

Photo by Manav Sawhney

marketplace demand for sustainability. The WWF Salmon Aquaculture Dialogues have repeatedly put NGOs, farmers and scientists around a table to hash out a definition of responsible salmon farming.

One significant change over the last decade, says Arnesen, is a 50 percent reduction in the portion of fishmeal used in salmon feed.

Nell Halse, VP of communications for Cooke Aquaculture, which annually produces 115 million pounds of Atlantic salmon produced in Atlantic Canada, Maine and Chile, notes Canada's bay area management is one example of improvement.

The old way, she says, was to raise two to three generations of fish on a single farm with no fallowing period. Area management, at first voluntary and now required, coordinates the stocking of fish among producers so that a portion of pens are for first-year fish, another for second-year fish and a third left fallow. Those production areas rotate over time.

One payoff has been a reduced need for antibiotics. "If

you have only one year-class in an area at a time, there is a lot less traffic," says Halse.

Cooke is also looking to fish native to local waters that eat sea lice as a way to cut chemical use for sea lice control, says Halse, who declined to name specific species.

And six of Cooke's New Brunswick salmon farms are growing mussels and seaweed with salmon in an integrated multi-trophic aquaculture (IMTA) system, a technique researched and developed by Dr. Thierry Chopin, a research scientist at the University of New Brunswick in St. John.

The idea is to create a balanced ecosystem. "The solution to nutrification is not dilution but conversion within an ecosystem-based management perspective," according to Chopin.

Cooke has participated in the WWF Salmon Dialogues, eyeing the goal of future certification. Meanwhile, its farms are third-party certified under Global Trust and its salmon bears the Seafood Trust eco-label.

The Salmon Dialogues aim to create standards for third-

party certification of salmon farms that push the industry to eliminate or minimize negative environmental and social impacts while keeping it economically viable. A 60-day public comment period on the first draft of standards ended in early October.

Katherine Bostick, senior program officer with WWF's aquaculture team and coordinator of the Salmon Dialogues, says "really constructive and useful comments" have come in already.

The group meets in November to review comments and hopes to release its next draft in January. First certifications could occur by the end of 2011 at the earliest. It's too soon to estimate what portion of existing salmon production can meet the standards, says Bostick. Marine Harvest awaits the final standard to take a position on certification.

The standards represent significant work and progress, Arnesen, Bostick and Ritchlin all agree.

"We are a successful industry, but young," says Arnesen. "That means we have many areas where we



Photo by Thierry Chopin

Seaweed is cultivated near a salmon cage in Canada.

need to make improvements. Several improvements have been made over the last few years. I think we could say in many places our industry is pretty sustainable."

But a gap remains around what sustainable salmon farming looks like, according to CAAR's Ritchlin. The Dialogues have not convinced him that net pens can be sustainable.

"I think [the standards] lessen the pressure on the wild fish for some period of time so that we have a better opportunity to get to the longer-term solutions, which I still think are separating the wild fish from the farmed fish," says Ritchlin.

Contributing Editor Lisa Duchene lives in Bellefonte, Pa.



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