Bring on the barramundi

Featured Interviews | Innovation | The Interviews | 08/20/2014

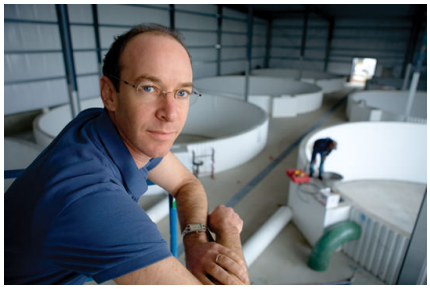
Josh Goldman's hybrid land/ocean approach to farming fish is setting the stage for a new generation of sustainable aquaculture operations.

It was Frances Moore Lappé's 1970s paen to sustainable eating, "Diet for a Small Planet," that first set Josh Goldman on the path of developing his "Better Fish." The iconic book's message of a looming world food crisis and its call for more efficient protein production suggested a clear solution to Goldman: aquaculture.

"Fish answered that challenge in a really profound way because of their highly efficient conversion abilities, which stem from them being cold-blooded and living in a gravity-free environment," says Goldman, founder and chief executive officer of Massachusetts-based Australis Aquaculture, the world's largest producer of barramundi fish.

Today Goldman sees closed containment systems as a key technology for the production

of juvenile fish. In 2007 he expanded Australis Aquaculture to Vietnam, where the fish are grown in land-based tanks for the first third of their life cycle, but only 10 percent of their weight. “The value there is being able to observe, manage vaccinations and grade the fish in a cost-effective manner, and to give them better conditions during their more sensitive life stages,” he says. After that, the fish are placed in off-shore grow-out cages in the open ocean.



Josh Goldman

> **“There’s great opportunity with a socially responsible vision for food producers to not only make food that tastes good and sells well, but food that promotes human health.”**
>
> **— Josh Goldman**

This new hybrid approach helped make the Australis barramundi the very first open ocean-farmed fish to receive the Monterey Bay Aquarium’s highest sustainability ranking of green “Best Choice” in June 2014.

“That’s a pretty big recognition of the power of innovation and the power of the right fish in the right environment,” says Goldman. And it’s timely too: According to a new report by the World Resources Institute, the amount of fish farmed by 2050 will need to more than double to meet projected demand, from 67 million tons in 2012 to approximately 140 million tons in 2050.

The birth of a barramundi market

Goldman first began tinkering with early closed containment aquaculture systems in the 1980s as a psychology student at Hampshire College in Amherst, Mass., where he lived in a student-built solar greenhouse attached to his dorm. He constructed a few fish tanks within the greenhouse with some fellow students, and began to raise tilapia. But Goldman soon realized that the algal-based system he used in his first closed containment system wasn’t sufficient. Relying on algae for water filtration proved incredibly unstable, and there was no commercial industry at the time to look to for answers. So Goldman set out to find his own.

Although tilapia is easy to grow, and the market for it was beginning to take off in the United States, Goldman predicted that American producers were quickly going to be at a disadvantage in the global tilapia market due to other countries’ lower labor costs and easier regulatory climates, which indeed happened.

“I wanted to prove that the technology of closed-system farming could work with more challenging fish,” says Goldman.

He spent the next 13 years focused on closed containment farming for striped bass, where he began to pioneer the fundamental knowledge of the processes required in closed containment aquaculture farming, including the basic ratios of oxygen addition to CO2 removal to waste removal, and how to create a system that was cost-effective.

“We have it down pat now, but at that point, it was very much wandering in the wilderness. Scientific trial by error, because you don’t know what you don’t know,” he says.

But by 2004, he again was looking for a better species of fish to farm. He found it in barramundi, a fish native to Australia that lives in fresh water and spawns in salt water year-round. White-fleshed barramundi flourish on vegetarian feed and have large gills, which helps make them better able to resist disease. And unlike most other fish, they’re able to convert vegetarian feed into the omega-3 fatty acids people need.

Soon, he was growing barramundi in land-based tanks in an unlikely place—Turner Falls, Mass., a quiet former mill town in a bucolic New England setting. There was just one problem: Most Americans had never heard of barramundi. Even with the farming system in place, Goldman realized that he would need to move aggressively to sell the public on an unfamiliar fish.

“We were reaching out and building relationships with top chefs who were passionate about sustainability, dietitians who were trying to get people to eat more fish (but often worried about contaminants), and environmentalists whose mission was to protect the oceans,” says Goldman. “We also did a lot of tasting events because we learned that when people tried our new barramundi, it often became their new favorite fish.”

The effort paid off.

“Josh brought a fish to America that we hadn’t seen before, and we seem to be accepting it,” says Paul Greenberg, author of “American Catch” and “Four Fish.”

Goldman’s success meant growth. A decade later, his Massachusetts facility has become one of the largest water re-use facilities in the world, recycling and purifying 99 percent of the water used, while any fish waste produced is donated as fertilizer to nearby farmers. Today, nearly all of the production in the closed containment tanks at the Massachusetts location is sold to the live seafood trade and ends up in every substantial Chinatown in North America, where it’s sold to cooks or restaurant guests who want to select their fish while it’s still swimming. Australis’ much larger Vietnam production, meanwhile, is packaged and frozen for supermarkets and box stores like Costco.

Diving into new technology options

Goldman says the story of his barramundi is the story of a technology journey, involving continuous improvement in understanding the technical issues related to bringing new species to markets and then executing refinements to deliver better quality with a