



Virginia fish farm sees future in shrimp

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The average American ate 16.5 pounds of fish and shellfish last year. Shrimp was the favorite, accounting for 4.4 pounds.

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About 80 percent of shrimp Americans eat is imported, the bulk of it from Southeast Asia and China. In fact, 83 percent of all seafood consumed by Americans is imported, says the Commerce Department.

Bill Martin, president of Blue Ridge Aquaculture in Martinsville, Virginia, sees a "huge opportunity" in those numbers.

Martin wants to do something about the balance of trade by raising more seafood in this country. He also wants to help address consumer concerns, spurred by recent headlines, that some seafood from foreign sources could be unsafe to eat.

For nearly two decades, Martin has operated what he calls the world's largest indoor fish farm near this Henry County city. Now, he has partnered with MariCal Inc. of Portland, Maine, to build a \$3 million (€2.1 million), 30,000-square-foot facility to test growing shrimp indoors.

MariCal, an aquatic biotechnology company, has patented methods to raise saltwater species in low-salt environments. The technology alters the natural salinity sensor in fish to trick them into thinking they are in saltwater.

"We have intellectual property that allows us to raise saltwater species in fresh water that wouldn't even be considered brackish," said Martin, who wants to raise shrimp 225 miles from the nearest ocean.

Nobody before has invested as much in trying to raise shrimp indoors, said George Flick, a professor in food science and technology at Virginia Tech. "He is really a pioneer."

Flick is part of a team of researchers from across the United States who are helping with the experiment. The team is drawing on genetic research and investigating the best ways to raise shrimp indoors.

Martin's facility has been designed so all testing can be done in triplicate to reinforce the findings.

Martin has spent several years learning from his successes and failures.

"It's been a 15-year test of this sustainable system," Martin said of his indoor fish farm in an industrial park near the Martinsville Speedway.

Martin installed the first fish in tanks in 1989. It was catfish then; he also experimented with striped bass. For now, his sole product is tilapia, a freshwater fish native to Africa that has grown in popularity among U.S. diners.

"We had disease problems and all manner of other issues to work out," Martin said. "It took us awhile to get it straight, and took us awhile to pay off our debts."

Blue Ridge produces four million pounds of tilapia a year, a tiny fraction of U.S. consumption. The fish, sold when six months old, are trucked live to Asian food markets in cities such as Washington, New York, Boston and Toronto. Selling the fish live saves Martin on processing and associated labor costs.

Martin said he uses no antibiotics, hormones, steroids or chemicals in fish production.

The fish are hatched at the farm, and 70 percent of fingerlings are culled. Of the remaining fingerlings that will be raised to a marketable size, 90 percent are male, Martin said. Sixty thousand fingerlings go into a single tank. When they reach a certain size, the population half are moved to a different tank to grow to one fish per gallon of water.

Sardines in a can would appear to have more room to move around, but Martin said the mortality rate is 2 percent. A sump pulls waste from a tank's bottom -- waste that could soon become part of the shrimp diet. Water, supplied by

deep wells, is constantly filtered and one-third of it is changed after every 500 pounds of food, or about once a day.

"The fish are engineered for the system in which they are raised," Martin said. "They are happy, stress-free and eat 24 times a day."

Production costs, Martin claimed, are the lowest in the fish-farming industry. "We don't have winter kill, summer kill or predatory diseases, none of those things."

Academic studies put the break-even cost, including depreciation, of raising tilapia in indoor re-circulating systems similar to Martin's at between \$1.07 (€0.76) and \$1.19 (€0.84) per pound of live fish.

Most fish farming is conducted outdoors in ponds or in cages in lakes and streams.

The success of the shrimp trial will depend on whether Martin's staff can achieve the half-pound of shrimp to one gallon of water density that Martin wants, said Todd Blacher, the operation's shrimp-farming expert.

"To make this profitable, we need to get to a density . . . no one has done before," said Blacher, a Californian who has worked on shrimp farms in South America and China. "People have tried and failed . . . but mostly we're patient -- that's a big key."

If it works out, the United States can start making itself self-sufficient in shrimp, Flick said.

Self-sufficiency is important because of competition from other nations for seafood imported into the United States, Flick said.

Martin looks to the integrated model of the poultry industry and innovative model of the pharmaceutical industry to guide his business. Like the poultry industry, he will control the raising of fish from the egg to the market, including the processing of his feed. And, like the drug industry, he wants to keep a steady stream of new products in the pipeline.

Oysters, clams and squid all have appeal for this entrepreneur.

Martin wants to make Virginia the largest seafood producing state in the nation. Virginia ranks ninth in the number of fish farms and eighth in the value of aquaculture products sold. The rankings do not include commercially caught seafood unloaded at Virginia ports.

He employs 40 people at Martinsville and seven at Saltville, but he envisions a business employing 1,500 people.

He's looking for 400 or 500 acres around Martinsville where he could greatly expand his tilapia operation as well as the cobia and shrimp, eventually.

Martin said it would take \$300 million (€213 million) to fully build out the farm to produce all three species, adding he's had no lack of interest from the investment community, he said.

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