

# Alleviating the global fish shortage – without harming the environment

Israeli blue tech company Pure Blue Fish has developed a recirculating aquaculture system (RAS) that produces more, healthier fish – without wasting a drop of water

By Daniel Ben-Tal

**THE WORLD'S** fish stock is in crisis. Two-thirds of the planet's edible seafood is already fished to the limit or overfished, according to the UN Food and Agriculture Organization (FAO). And if humankind continues at this rate, there will be no fish left to eat in a generation's time.

Man-made solutions such as artificial inland farms and seabound fish cages can only scrape the surface of the problem – and can severely damage the environment. But one innovative Israeli company says it can redress this imbalance with an innovative, sustainable biological system that enables fish to be bred away from the ocean, without requiring seawater and without wasting water.

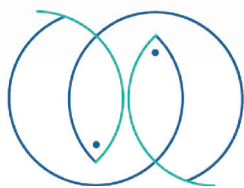
“We have the world's first commercial fish farming system operating as a 100% recirculating aquaculture system (RAS),” says Yuval Weiss, CEO of Israeli blue tech company Pure Blue Fish.

“We have solutions and technologies that no one else has. Construction of our pilot site in Israel began during the corona pandemic, and the model has proven that it works.”

The company's guiding principles include raising and supplying fish in an environment free of chemicals, antibiotics, heavy metals and the microplastics increasingly found in seawater. Its technology uses natural biological processes to filter and recycle the water



The Pure Blue Fish team together with South Carolina's Commissioner of Agriculture Hugh Weathers and his delegation during a visit to the fish farm in Binyamina.



PURE  
BLUE  
FISH

in indoor tanks in which the fish grow. This zero-discharge system conserves water, has self-waste treatment, and eliminates the need for fish farms to be located near major water sources. Environmental and social benefits include reducing greenhouse gas emissions, water pollution, land use, and pressure on wild

fish stocks.

“It takes about six weeks to prepare our filters to populate our system,” says Weiss. “We make seawater, in effect, using minerals, salts, and tap water. This natural environment produces tastier fish – and they're growing more quickly than we expected.”

The company's directors talk in terms of beginning a revolution in the global food sector.

“We've proved that it works. By developing biological methods unique to us, we have essentially created a microcosm of the ocean, without needing the sea,” says Ehud Brill, a marine biologist and director of technologies at PBF.

“Moreover, the fish are thriving. PBF brings great value to the world by offering the capability to sustainably grow sea fish anywhere, without relying on an ocean water source and without polluting emissions into the environment.

“Our system has a variety of advantages and qualities, such as a fully controlled fish breeding environment; advanced and friendly technology without the use of chemicals or discharging sewage into the environment; energy efficiency; and proximity to markets,” says Brill, an international expert in aquaculture.

“We leave no environmental footprint. Only the natural gases carbon dioxide and nitrogen are released into the atmosphere. It's a completely sustainable system – that's our greatest

NITZAN ZMORA



advantage,” he stresses.

PBF’s provisionally patented development operates as a closed and endless cycle, without any external connections, while other advanced aquaculture systems must be near the shore because they draw water from marine sources (and then pollute seawater when returning the used water from fish farming).

The company recently announced the successful intake of some 10,000 red drums [aka channel bass] at its trailblazing marine farm near Binyamina. The fish, originally placed in the farm’s tanks in July, are now thriving, growing faster than expected in the simulated ocean conditions. They will remain in the tanks until they reach market size, and be sold exclusively in the local market, Weiss explains.

The four growing tanks can produce about 125 tons a year, says Brill. “We will start selling our fish only in August next year. This year it’s been harder to generate funds. People are afraid to invest in Israel while there’s a war going on.”

“We are open to generating more overseas investment,” hints Weiss, whose family-owned construction company is heavily invested in the project.

But the Israeli market is tiny. Once the technological capability is successfully demonstrated, PBF intends to enter the global aquaculture market by establishing large farms across the United States near major population centers.

“The company’s business strategy is aimed at establishing aquaculture farms and marketing produce throughout North America in order to become a significant player in the US food market,” says Weiss.

Two sites in South Carolina and Texas are expected to start construction within months.

“The idea is to establish American management teams with firsthand experience,” Weiss explains. “We plan the sites, choose the location, bring in and sell the fish, and manage the operation. Many companies establish large facilities from Day One. Our method involves ‘responsible aquaculture,’ slowly building up a farm with local connections, in stages, and in line with the local market.

“The company’s business plan foresees eight farms, each producing up to 5,000 tons annually, covering most of the concentrations of population density in the US,” says Weiss. “For example, a farm in Nevada can supply to Las Vegas and the Los Angeles region, while the South Carolina operation will eventually provide fish from Atlanta to Miami.



ROY LAVIE

The fish tanks at Binyamina. ‘The company’s guiding principles include raising and supplying fish in an environment free of chemicals, antibiotics, heavy metals, and the microplastics increasingly found in seawater.’

“We didn’t come to sell technology – we came to sell fish. Each farm should be capable of producing 5,000 tons of several types of fish annually. The potential of the fish market is tremendous,” he notes, adding that the next stage after North America will be Europe.

#### Selected species

The company is focusing on breeding a variety of fish species such as kingfish, red drum, white sea bass, and grouper, with others to come, catering to the culinary demands of different geographical areas.

“So far, we’ve managed to successfully grow eight different types of fish, meaning flexibility in our output according to local preferences,” notes Weiss.

These include the red drum fish (*musar* in Hebrew) from the Atlantic Ocean, whose larvae were originally brought from the US to Israel in 1996 and are now grown in several sites in Israel. Kingfish are to be introduced in 2025. For now, the system is “running in” on red drum.

Brill and his team of biologists and technicians have spent the last decade refining and scaling up the technology for commercial use, creating a highly efficient and cost-effective alternative to traditional aquaculture methods, and have compiled a lengthy list of precise work protocols. In recent years, they’ve been sweating over the detailed protocols, emphasizing seemingly minor details, he says, “and we’re constantly upgrading the protocols.”

Brill points to the system’s advantages.

“The tank-based marine aquaculture practices used throughout East Asia and South America waste a lot of water and are dependent on and pollute their local environments. The semi-intensive ponds in advanced countries still use a lot of water, and they secrete pollutants. Recycling aquaculture systems have aerobic filters that neutralize harmful substances such as ammonia, and even though 97 percent of the water is recycled, pollutants still find their way into the environment.

“We have completely closed the whole system. There’s no outlet for water. In effect, we create a little ocean that imitates the natural processes, but far more intensively and efficiently. In a tight shoal, the fish feel a safer environment for them to grow in. We are the greenest option, responsible and sustainable,” he explains.

“The other advantage is that we have complete control of the process, without using antibiotics or chemicals,” Brill continues.

“Fish that grow in unpolluted waters are healthier and tastier – from experience,” he winks. “To check out this aspect, we supplied our fish to high-end Manhattan restaurants, and the chefs raved about the taste and asked for more.”

He notes that the company’s development aligns with several UN Sustainable Development Goals, including food security, responsible consumption and production, decent work and economic growth, and environmentally friendly practices.

Brill emphasizes the company’s environmental strategy from the outset, pointing to the newly planted trees surrounding the compound, “without any chemical spraying.”

“You need to work with nature, not against it,” he says. “We see our mission as helping the oceans, as well as helping the nature surrounding our farms.”

The company’s strategy also includes the principle that the fish are only to be sold locally – a maximum of six hours from farm to customer. “We rejected a potentially lucrative offer to export our kingfish to the US on principle, says Brill, noting that up to 95% of the fish consumed in Israel are imported. “They’re brought here by plane or ship, producing more greenhouse gases. We will break that cycle.”

“There aren’t many edible fish left in the Mediterranean,” sighs Brill, who scuba dives in the nearby sea about twice a week. “Our sea is in bad shape. The fishing industry in Israel has practically collapsed. PBF’s system can help to save the oceans.” ■