

FOOD

FARMING A BETTER FISH | PERU'S LONG-LOST TOMB

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NATIONAL
GEOGRAPHIC



HERO DOGS

**A SOLDIER'S
BEST FRIEND**

Layka saved lives of U.S. troops in Afghanistan after she was shot and gravely wounded.

The Future of **FOOD** natgeofood.com

By 2050 we'll need to feed two billion more people. This special eight-month series explores how we can do that — without overwhelming the planet.

Can the
“blue revolution”
solve the world’s
food puzzle?

*The world now produces more
farmed fish than beef—and
that's just the beginning.*

How to Farm a Better Fish

By Joel K. Bourne, Jr.

Photographs by Brian Skerry

In a dark, dank warehouse in the Blue Ridge foothills of Virginia, Bill Martin picks up a bucket of brown pellets and slings them into a long concrete tank. Fat, white tilapia the size of dinner plates boil to the surface.

Martin, president of Blue Ridge Aquaculture, one of the world's largest indoor fish farms, smiles at the feeding frenzy.

"This is St. Peter's fish, the fish Jesus fed the multitudes," he says, his raspy voice resonating like a preacher's. Unlike Jesus, however, Martin does not give his fish away. Each day he sells 12,000 pounds of live tilapia to Asian markets from Washington, D.C., to Toronto, and he's planning another farm on the West Coast. "My model is the poultry industry," he says. "The difference is, our fish are perfectly happy."

"How do you know they're happy?" I ask, noting that the mat of tilapia in the tank looks thick enough for St. Peter to walk on.

"Generally they show they're not happy by dying," Martin says. "I haven't lost a tank of fish yet."

An industrial park in Appalachia may seem an odd place to grow a few million natives of the Nile. But industrial-scale fish farms are popping up everywhere these days. Aquaculture has expanded about 14-fold since 1980. In 2012 its global output, from silvery salmon to homely sea cucumbers only a Chinese cook could love, reached more than 70 million tons—exceeding beef production clearly for the first time and amounting to nearly half of all fish and shellfish consumed on Earth. Population growth, income growth, and seafood's heart-healthy reputation are expected to drive up demand by 35 percent

or more in just the next 20 years. With the global catch of wild fish stagnant, experts say virtually all of that new seafood will have to be farmed.

"There is no way we are going to get all of the protein we need out of wild fish," says Rosamond Naylor, a food-policy expert at Stanford University who has researched aquaculture systems. "But people are very wary that we're going to create another feedlot industry in the ocean. So they want it to be right from the start."

There are good reasons to be wary.

THE NEW "BLUE REVOLUTION," which has delivered cheap, vacuum-packed shrimp, salmon, and tilapia to grocery freezers, has brought with it many of the warts of agriculture on land: habitat destruction, water pollution, and food-safety scares. During the 1980s vast swaths of tropical mangroves were bulldozed to build farms that now produce a sizable portion of the world's shrimp. Aquacultural pollution—a putrid cocktail of nitrogen, phosphorus, and dead fish—is now a widespread hazard in Asia, where 90 percent of farmed fish are located. To keep fish alive in densely stocked pens, some Asian farmers resort to antibiotics and pesticides that are banned for use in the United States, Europe, and Japan. The U.S. now imports 90 percent of its seafood—around 2 percent of which is inspected by the Food and Drug Administration. In 2006