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Sushi Fresh From the Deep . . . the Deep Freeze

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Yoshiaki Habara cut slabs of frozen tuna at True World Foods in Elizabeth, N.J. New technology allows fish to be preserved for two years.

To many food lovers, sushi has become a near religion, and a cornerstone of the faith is that the fish is extraordinarily fresh. Its priests are chefs with seemingly mystical abilities to summon fresh fish from all corners of the globe.

But because of health concerns and growing demand, 50 to 60 percent of sushi in the United States is frozen at some point in its journey from the ocean, according to wholesalers. And rare is the sushi restaurant that tells customers upfront that they may be eating fish that has been in deep freeze for up to two years.

Most would be even more surprised to learn that if the sushi has not been frozen, it is illegal to serve it in the United States.

Food and Drug Administration regulations stipulate that fish to be eaten raw — whether as sushi, sashimi, seviche, or tartare — must be frozen first, to kill parasites. "I would desperately hope that all the sushi we eat is frozen," said George Hoskin, a director of the agency's Office of Seafood. Tuna, a deep-sea fish with exceptionally clean flesh, is the only exception to the rule.

But tuna is often frozen, too, not necessarily to make it safe, but because global consumption of sushi continues to rise. Frozen fish usually costs about half as much wholesale as fresh. And some cuts,

like the prized fatty toro, are not always available fresh.

Naomichi Yasuda, the owner of Sushi Yasuda, the acclaimed sushi restaurant in New York City, said he imported fresh tuna but froze it himself, selling it for \$10 a piece.

"American customers don't want to hear that something is out of season" he said with a shrug. "People want toro every day."

At the Elizabeth, N.J., warehouse of True World Foods, a manager, Ken Kawauchi, recently readied a room-size freezer to receive eight more tons of premium tuna frozen with sophisticated technology that chefs say preserves the texture and flavor of the fish.

"This product is better than fresh," he said. "We start freezing it almost before it's dead."

At 76 degrees below zero, you can feel your hair follicles freeze. A 20-pound chunk of premium bluefin tuna is rock hard and cold enough to burn a blister on your finger.

But all it takes is a band saw, 10 minutes and a bowl of warm water to produce deep red, dewy slices of the finest sushi money can buy, the same toro served at Manhattan sushi shrines.

Sabine Marangosian, who works in Midtown Manhattan, said she ate sushi "at least once a week." "I guess I would understand that some sushi is frozen," she said. "But I would hope that's not the case at Nobu."

But Shin Tsujimura, the sushi chef at Nobu, closer to Wall Street, said he froze his own tuna. "Even I cannot tell the difference between fresh and frozen in a blind test," he said.

Even Masa Takayama, whose sushi temple Masa, in the Time Warner Center, charges a minimum of \$300 to worship, said he used frozen tuna when fresh is unavailable.

Many sushi bars, in Japan and elsewhere, routinely use frozen fish when fresh is unavailable or more expensive than the market will bear.

"In Japan," Mr. Kawauchi said, "50 percent of the sushi and sashimi is frozen. Only my American customers are so concerned with fresh fish."

Americans have clearly overcome the initial resistance that greeted sushi when it was widely introduced nationally in the 1980's. The number of Japanese restaurants across the country has steadily increased in the past five years, according to the National Restaurant Association. And that number does not include the supermarkets, delis, cafeterias, and Costco stores where sushi can now be purchased.

A.F.C. Sushi, a Los Angeles-based sushi franchiser, has more than 1,800 outlets nationwide. It already supplies the Staples Center, in Los Angeles; Florida State University, in Tallahassee, Fla.; and the United States military, which buys sushi for its commissaries. Although the company's Web site refers to "fresh sushi," A.F.C. uses only frozen fish in its products.

According to wholesalers like Dave Rudie, a pioneering sushi supplier in California who sells both fresh and frozen fish, more and more frozen fish is being served as sushi here.

Mr. Rudie said that worldwide, some sushi products are virtually always frozen. "Ninety percent of shrimp, of course," he said, "The salmon roe and octopus, 99 percent. And you definitely want all your salmon frozen, because of parasites."

The Food and Drug Administration does not enforce the frozen-fish rule, leaving that to local health officials. The agency says sushi fish can be frozen either by the wholesaler or in the restaurant, and each party likes to believe that the other is taking care of it.

"I always assumed that the fish is frozen at some point before I get it," said Jack Lamb, owner of Jewel Bako in the East Village in Manhattan, "but just for a minute, like an X-ray."

Ian MacGregor, whose wholesale business, Lobster Place, supplies the sushi hot spot Geisha, in Midtown Manhattan, said he had heard countless euphemisms for frozen fish in restaurants. "Fresh-frozen, re-freshed, flash-chilled, take your pick," he said. "It's all frozen."

But "superfrozen" fish seems to be in a category by itself. Many top sushi chefs are finding that fish frozen to about 70 degrees below zero, instead of the commercial standard, usually 10 below, can stand up to their rigorous standards.

Tuna, one of the most expensive sushi fish in the world, has been the test market for superfreezing. Freezing technology that truly preserves the quality of fresh fish is relatively new, said Eric Graham, operations specialist for ColdWave Systems, a global seafood shipper. Developed by the Japanese fishing industry in the 1990's to preserve the catch on long trips, superfreezing can reduce the core temperature of a 500-pound tuna to minus 70 degrees in about a day and a half. Packed in artificial snow ground from dry ice and surrounded by liquid nitrogen, that fish can be preserved with no decomposition for as long as two years.

"It's an amazing product," said Mr. Lamb, who recently bought a medical freezer, designed to store transplant organs, to keep tuna in his restaurant's basement.

But in places like Los Angeles, where the Japanese Restaurant Association of Southern California has considerable local support, frozen sushi is not a popular notion.

"We try to recognize that sushi has been made with fresh fish in Japan for thousands of years," said Terrance Powell, chief environmental health specialist for Los Angeles County. Mr. Powell and his team of 150 inspectors have held food safety classes for sushi restaurant operators in Japanese, Korean, Thai and Vietnamese, but he concedes that most operators, knowingly or not, are probably not serving only frozen fish.

"Frankly," he said, "warm sushi rice that sits out for hours is a bigger public health threat than raw fish."