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Fish from afar: Trends in international aquaculture

New questions arise as chefs consider international fish species for their menus

BARRAMUNDI from Australia. Branzino from Italy. Daurade from France. As purveyors introduce chefs to these and other fish from around the world, some may wonder how and where these species were raised, caught, and shipped, and if they're responsible choices for their restaurants.

International aquaculture may help meet the demand for more consistent seafood production while allowing overfished wild species to restore their populations. But aquaculture comes with its own set of concerns, as does the choice of international fish. Less familiar species like barramundi and branzino might seem like ideal alternatives to overfished or poorly farmed stocks, but since the health of our oceans and waterways is interconnected, the same critical purchasing eye should be applied whether fish was caught 200 or 20,000 miles off our shores.

Regulations at Home and Abroad

Although over 70% of seafood consumed in the United States is imported, the Economic Research Service of the United States Department of Agriculture tracks only the largest commercial aquaculture imports into the US - tilapia, shrimp, catfish and salmon. Other species of lesser commercial value, like branzino, cobia, or char, constitute a single subcategory, complicating general conclusions about where and how the majority of these species are produced.

Many countries, particularly developed countries, have regulations that promote sustainable aquaculture within their own territories. Organizations like the Food and Agriculture Organization of the United Nations (FAO) have introduced voluntary codes of conduct to help support sustainable farming initiatives. But just because a country has guidelines in place doesn't mean that producers always follow them. "You have good farmers and bad farmers - both on land and in the ocean," says Michael McNicholas, managing director of Rhode Island-based Sustainable Seafoods LLC.

An Identity Crisis

One central concern for many chefs is that farmed fish are often raised far from the natural habitat of their wild relations. For instance, the barramundi your supplier showed you may have been hatched in Australia, but it could have been raised to market size in a facility in Western Massachusetts. Arctic char, once native to polar regions, is now farmed in West Virginia, among other places. Without a native habitat to help inform a species' identity, farmed fish is in danger of becoming a pure commodity as opposed to a well-managed sustainable resource. Somehow, this diminished native identity also diminishes the fish's overall value.

Species Snapshots

Barramundi is native to waters from the eastern Persian Gulf to northern Alaska. The majority of the world's farmed barramundi is produced in Southeast Asia, with Australia also producing a substantial amount of the global supply, and the U.S. farming a small amount of total production. Barramundi grows quickly and can eat lower cost pellet foods, which makes it ideal for large scale aquaculture production.

Branzino, also known as Mediterranean Sea Bass or Loup de Mer, is indigenous to the eastern Atlantic, the Mediterranean Sea, and the Black Sea. Greece, Turkey, Italy, Spain, Croatia, and Egypt produce the largest amount of farmed branzino. The bulk is farmed in sea cages, though many operations use seawater ponds and lagoons. Branzino sea cage production has the potential for the same impact as Atlantic salmon farming, but it is possible to find fish marketed as sustainable. Ask your distributor.

Daurade, also known as dorade, sea bream, and orata, is common in the Mediterranean Sea and off of the Eastern Atlantic coasts. It's raised in sea cages, lagoons, and land-based installations, and some of the production is marketed as organic.

The issue of origins also raises the issue of flavor. Like some wines or cheeses, wild fish has terroir, too, depending on its ability to move around its native habitat and eat the diet provided by that habitat. The barramundi raised in an indoor facility didn't eat the same diet as wild barramundi, nor did it have the chance to swim and develop the firm musculature admired in many wild fish. The diets of wild fish also help them develop immunity to ecological or biological pressures. There's no guarantee that wild fish will always taste better than farmed - consider the case of cleaner-tasting farmed catfish - but in most cases, a native habitat provides any species, fish or not, a better chance to develop flavor and texture than a manufactured habitat does.

Ask questions, encourage accountability

The aquaculture industry hasn't been around long enough for scientists and other experts to make conclusive decisions about ecological and environmental impacts. Still, asking questions about the sustainability of the international species you've been seeing will help encourage accountability at all levels of the production chain, says Megan Westmeyer, sustainable seafood initiative coordinator at the South Carolina Aquarium. Westmeyer and others suggest asking your purveyors the following questions:

How far does the fish have to travel to reach its destination?

Many of the concerns about domestic and international aquaculture practices are similar. But fish flown from other countries requires the use of resource-intensive transportation and preservation methods. Overnight air shipping might not affect freshness, but it does use a lot of fossil fuel.

What does the fish eat? Carnivorous fish need to eat fish protein, which often comes in the form of feed made from other wild fish species. Although some wild stocks used in this way are products of by-catch, others are deliberately caught (or farmed) to become fish food. This practice can strain wild stocks. Vegetarian fish like tilapia don't require any fish protein for their food, and so are thought to be more sustainable.

How does the fish convert its food? The term "food conversion ratio" (FCR) is used to describe the pounds of feed used to produce a pound of fish.

Resources

Fisheries Global Information System:

Aquaculture

<http://www.fao.org>

Go to Fisheries Global Information System (FIGIS) page for aquaculture glossary and other information.

National Oceanic and Atmospheric Administration

Aquaculture Information Center Frontpage

<http://www.lib.noaa.gov/doc/aqua/frontpage.htm>

-Basic aquaculture information and statistics

Aquaculture Network Information Center

<http://aquanic.org/publicat/intlpubs.htm>

-Links to aquaculture publications.

Choosing farmed fish with a low FCR will help reduce the amount of wild fish taken from the ocean. Farmed Atlantic salmon, for example, has a 3-to-1 FCR: three pounds of feed for every pound of salmon produced, whereas farmed daurade's FCR can be as low as 1.3-to-1. And fast-growing fish use fewer resources than slow-growing ones. Cobia, a farmed predatory species, uses its food efficiently, which helps it grow faster than other fish. Less feed, and therefore fewer resources, are needed to maintain the cobia before it's harvested.

Is the fish raised with antibiotics?

Increasing the number of fish raised in any given system can mean greater profits for producers, but greater fish density can also affect the fish's health. As in overcrowded cattle or hog farms, antibiotics may be needed to treat fish disease caused by such close quarters. Recent studies have linked the use of antibiotics in aquaculture to the development of antibiotic-resistant strains of bacteria in people.

Aquaculture Systems: Open vs. Closed

Consumer groups, like the Center for Food Safety, express concern over the open system method of aquaculture. Open systems, often used to farm salmon, include net pens and sea cages that are placed in coastal areas and waterways with continuous water exchange. Fish waste flowing between the

enclosure and the surrounding environment is one ecological risk; the release of antibiotics (used to treat disease in crowded pens) into the water is another. The potential for farmed fish to escape into the wild and genetically mix with wild stocks also makes critics of open systems wary.

Ocean ecology is unthreatened by closed systems, like natural or man-made ponds or land-based tanks, which don't expose the fish to outside waters. Wastes are either treated and the water is recirculated, and in some cases, wastes aren't treated. In closed systems, there's no danger of farmed fish mixing with wild ones. But, points out New England Aquarium aquaculture research scientist Michael Tlustky, the costs of closed systems lie with the operations that use high energy outputs, or with operations that overcrowd their fish, which can increase the risk of disease and fish mortality.

In the End

Commercial aquaculture is a relatively new field, so sourcing fish that meet your own requirements for sustainability requires some research into producers' practices. Aquaculturists abroad have not yet adopted uniform, industry-wide standards, so the best bet is to keep asking questions, say experts.

"Distributors may say they don't know this information," says the New England Aquarium's Tlustky, "but don't take 'I don't know' for an answer. Find a distributor who does know this information. The more chefs ask questions, the more accountability the industry will need to have."

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