

## Broiled, blackened, fried - DNA-tested?

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Tons of catfish from China pile up in Los Angeles warehouses until a Gainesville food-testing laboratory decides what they are.

A New York DNA lab that mainly analyzes research mice is now testing restaurant fish for newspaper and television stations all over the country. About 60 percent of the samples turn out to be fakes.

A Canadian university is building a genetic database of every animal species on earth. Eventually, restaurant diners might insert a sliver of today's "fresh catch" into a handheld device that can tell if it's grouper or \$2-a-pound catfish.

These days, the seafood business has moved well beyond fried vs. broiled. Fortunes can rise or fall on proper identification of what people are eating.

Genetic testing, which zeros in on a minute strip of DNA, has become the gold standard for separating honesty and deception.

"It's the most important thing to come along in a long time," said Bob Jones, executive director of the Southeastern Fisheries Association, a trade group long frustrated by seafood substitution.

Until recently, a cooked piece of fish, slathered in sauce, could not be traced. Genetic testing can lift the veil, Jones said.

"It tells the public that there is a problem beyond anyone's belief."

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For years, buffet lines and Sunday socials have exploited the inexpensive virtues of Southern catfish.

Vietnamese fish farmers saw opportunity.

About six years ago, they began shipping over catfish species under a variety of names.

True basa, a delicate, flaky fish, has gradually gained market acceptance. But U.S. palates have yet to accept the cheaper and coarser tra, ponga, swai and sutchi.

So sometimes they sneak in, masquerading as grouper or other high-end fish.

Congress, trying to protect U.S. catfish farmers, declared four years ago that only one species could be sold as "catfish" - *Ictalurus punctatus*, better known in the bayous as channel cat.

Chinese fish farmers were ready. Years ago, they acquired a few live channel catfish and were growing them.

In 2003, the United States imported 700,000 pounds of Chinese channel cat fillets. Last year, 8-million pounds came in. That pales beside the 250-million pounds produced in the United States, but the trend is alarming, said Hugh Warren of the Catfish Farmers of America.

"Can you say steel, textiles, shoes, tractors?" Warren asked, referring to troubled U.S. industries.

With low labor costs and little regulation, Chinese channel cats undercut the U.S. variety by 75 cents to \$1 a pound.

The U.S. Food and Drug Administration is holding up every Chinese catfish load when it arrives, often in 50,000-pound containers. The government wants to verify that they are genuine channel cats, not some other Asian catfish sneaking in the back door.

The FDA hired Applied Food Technologies, a Gainesville research laboratory, to analyze the DNA. So far, about 300 fish have tested out as channel cats, with no fakes, CEO LeeAnn Applewhite told a seafood industry convention last week.

"That is not good news to the U.S. catfish industry."

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Applied Food Technologies is one of a few private U.S. labs set up to test seafood.

It first carved out a commercial niche by distinguishing Atlantic blue crab from a cheaper Asian blue swimming crab that was getting secretly mixed in with the real stuff.

About a year ago, the company signed up an important client. U.S. Foodservice, the nation's second largest distributor, began sending in frozen imported grouper, checking up on its foreign suppliers.

At first, almost every sample turned out to be Asian catfish, Applewhite said.

Grouper substitution came to public light in August, when the St. Petersburg Times reported that six of 11 "grouper" meals sampled from Tampa Bay area restaurants were actually cheap substitutes.

Therion International, of Saratoga Springs, N.Y., did the DNA testing for the Times.

Therion's main business is testing genetically altered lab mice to verify their characteristics. Therion also checks pedigrees of expensive pets and show animals.

After the Times' and other stories, media from Florida and around the country hired Therion for exposes of their own.

Just Friday, the CBS affiliate in Los Angeles reported that red snapper meals it bought from four tony restaurants were actually mahi, tilapia, mahi and catfish.

A Phoenix station tested five red snapper last year - all fakes.

"This isn't just a Florida problem. It's a nationwide problem," said Will Gergits, Therion's chief executive. "There's not enough supply to go around. People wanted grouper. People wanted red snapper. And there aren't enough fish."

Therion's fish-testing business has quadrupled since August, Gergits said. Now, individual restaurants and suppliers are sending in samples, either checking their own product or fish from competitors who they suspect are selling fakes.

Fish testing has also quadrupled in the last six months at Applied Food Technologies, Applewhite said. She draws clients mainly from industry, which has pressured foreign exporters to clean up the supply. In the last few months, she said, most samples are testing as grouper, not catfish.

A \$150 to \$200 a pop, DNA tests allow suppliers and restaurants to monitor the competition.

A year ago, the Florida Department of Agriculture rarely received complaints about seafood substitution, said Dr. John Fruin, chief of the Food Inspection Bureau, which regulates importers, processors and distributors.

Now, three to five complaints a month are lodged with the department, which is conducting DNA testing of its own.

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A genetic database under construction at Ontario's University of Guelph may eventually empower diners to test their own fish.

Called the Barcode of Life, the project aims to acquire genetic sequences for every known plant and animal species on Earth, about 1.5-million of them.

Computers read these sequences just as cash registers read UPC labels off cans of soup.

The University of Guelph is rapidly collecting specimens from museums all over the world. About 10 percent of all fish species and 30 percent of grouper are already tucked away. The goal is to finish all birds and fish by 2012.

The aviation industry already uses the database to analyze blood and feathers smeared on planes that collide with birds, said Dr. Paul Hebert, a project originator.

"You can reconstruct migration routes," he said. "Maybe you find out that you don't want planes flying at 10,000 feet in this area at this time of year because there might be flocks of meadowlarks."

The database will also target invasive pests. Exotic zebra mussels alone have cost Canada's economy \$500-million, Hebert said. When the database is complete, he said, port officials can snag a grub off an incoming ship, analyze its genetics and identify it within minutes.

Though even the cheapest gene sequencer now costs about \$50,000, Hebert said, the technology is evolving quickly and the price is falling, much like GPS did a decade ago.

In five to 10 years, he said, wireless, handheld sequencers will be able to analyze a sliver of animal flesh - say "grouper" in a restaurant - beam to the database, and identify the fish in five minutes.

"They will be in every kid's Christmas stocking."

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