OCEANA

BAIT AND SWITCH:

HOW SEAFOOD FRAUD HURTS OUR OCEANS, OUR WALLETS AND OUR HEALTH

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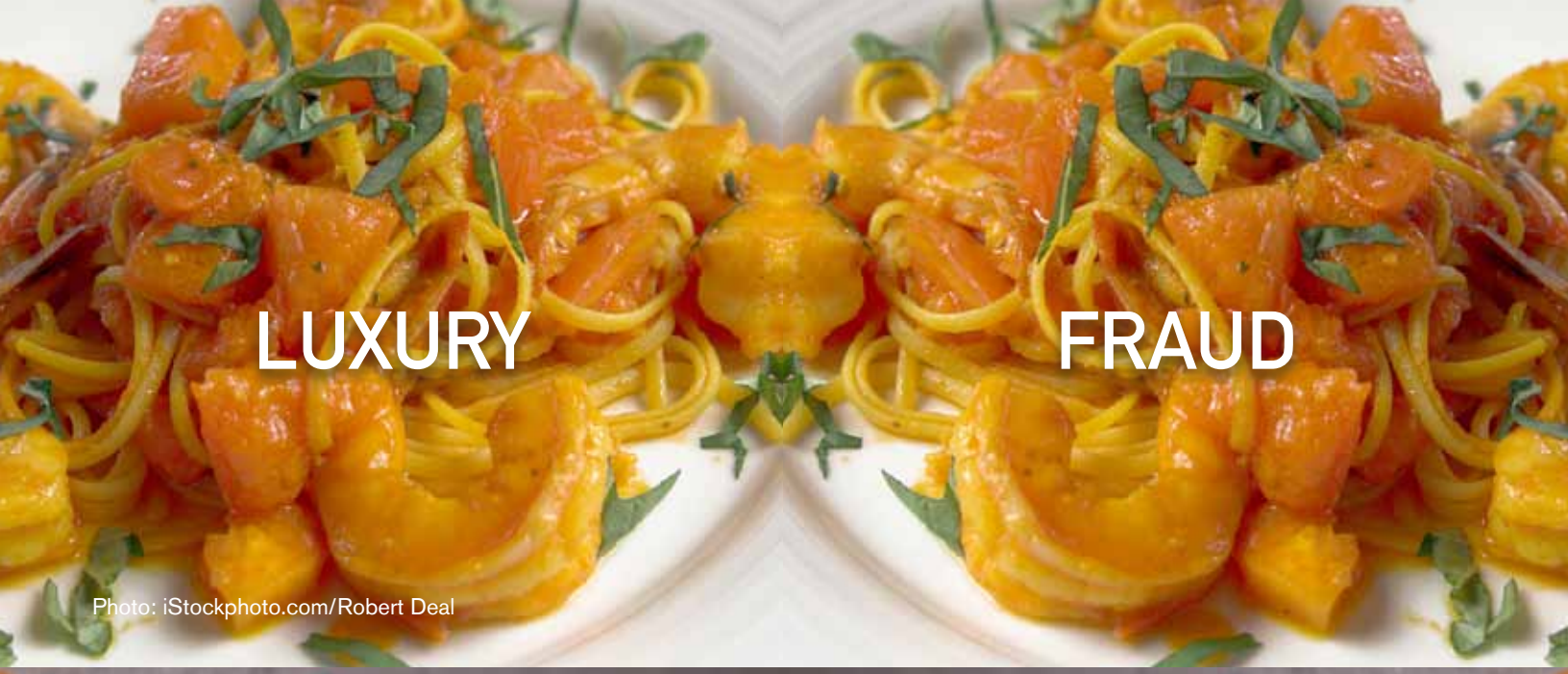

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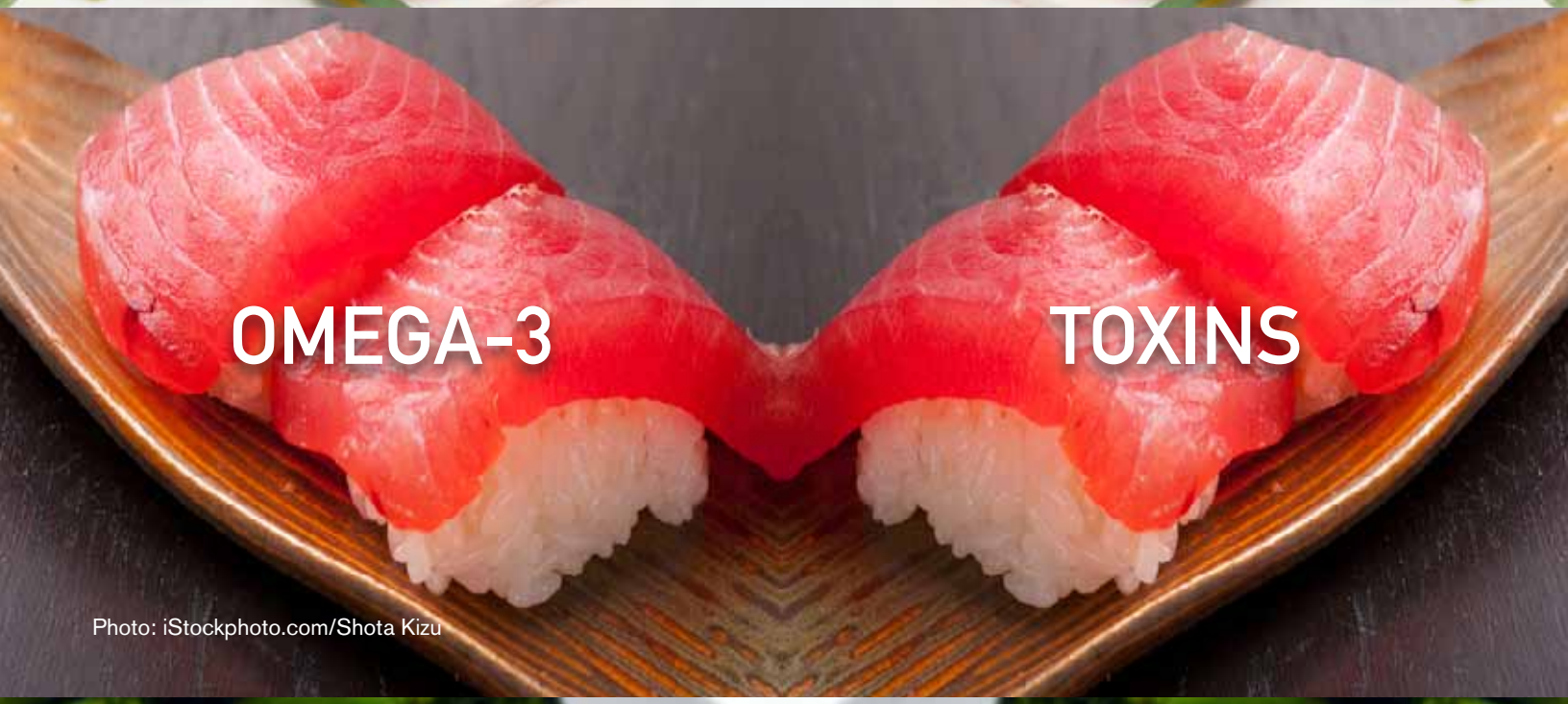

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Photo: Ray Moody

WHAT IS SEAFOOD FRAUD?

Seafood is one of the most popular foods in the United States. Yet, consumers are routinely given little or no information about where and when seafood is harvested. Moreover, the information that is provided on seafood labels is frequently misleading or fraudulent.

The government actively promotes the health benefits of dining on fish twice a week (USDA 2011) and global consumption is on the rise (FAO 2010). At the same time, overfishing continues to plague the world's oceans, with more than three-quarters of fish stocks worldwide fully or overexploited (FAO 2010). Partly in response to a decline in U.S. fisheries, most seafood eaten in the U.S. (84 percent) is imported, following an increasingly complex path from a fishing boat to our plates (NOAA 2011).

Despite growing concern about where our food comes from, consumers are frequently served the wrong fish — a completely different species than the one they paid for. Recent studies have found that seafood may be mislabeled as often as 25 to 70 percent of the time for fish like red snapper, wild salmon, and Atlantic cod, disguising species that are less desirable, cheaper or more readily available (Miller and Mariani 2010, Buck 2007, Jacquet and Pauly 2008).

With about 1,700 different species of seafood from all over the world now available for sale in the U.S. (FDA 2009), it is unrealistic to expect the American consumer to be able to independently and accurately determine what fish is really being served. In the U.S., the consumer price index for seafood has risen more than 27 percent over the past ten years (Brown et al. 2009), remaining steadily higher than other foods and creating significant economic incentives for fraud and illegal fishing.


Photo: iStockphoto.com

Most seafood consumed in the U.S. is imported, yet only two percent is currently inspected (GAO 2009). In addition to tracking systems, the U.S. needs to increase the frequency and scope of inspections to verify seafood's safety and origin at each step along the way. Traceability requires recording comprehensive information about each fish as it moves through processing, packing and distribution. In order to prevent fraud, consumers need to know where seafood comes from and be able to trace it all the way back to the sea.

HOW COMMON IS SEAFOOD FRAUD?

DNA testing is now confirming anecdotal reports that seafood fraud is disturbingly widespread. Both scientists and amateur seafood sleuths have exposed seafood fraud across the U.S. and Europe.

A recent review found false labels on more than one-third of fish (Jacquet and Pauly 2008), while other research found one-quarter of fish tested in the U.S. and Canada were mislabeled (Wong and Hanner 2008).

Government testing also shows a pattern of mislabeling, including 37 percent of fish and 13 percent of shellfish and other seafood during a nine-year period of testing by the National Marine Fisheries Service's (NMFS) National Seafood Inspection Laboratory from 1988-1997 (Buck 2007). The Food and Drug Administration (FDA) found about a third of seafood imports were mislabeled during port inspections in 2003-2004 (Mississippi Department of Marine Resources 2007).

Photo: iStockphoto.com/OMG Images

TRY THIS AT HOME

Photo: Oceana/Michael King

Emily Shaftel

Oceana staff member Emily Shaftel decided to explore what kind of information is really available to consumers about the seafood they buy. After buying 13 frozen or vacuum-packed products from five stores, she gleaned as much information as she could from product packaging, websites and conversations with representatives of the vendor or store of purchase, not independent investigation.

Photo: Oceana/Emily Shaftel

Mystery Salmon, Frozen Fillets

One of the more generic-looking frozen "bags o' fish" I can find, this package of "Boneless & Skinless Salmon Fillets" from Safeway supermarket provides very little information on the package, but does claim to be wild caught Pacific pink salmon, a product of China, and distributed by Safeway in Pleasanton, CA. Safeway's general customer service phone number and website are listed on the package. Safeway's website doesn't have very much product information, so I go straight to calling the customer service line. The customer service representative I speak with is not able to provide me with much information on the fish; she says that because their salmon is fished in many different areas she has no way of providing the catch location or method. She states that it is salmon from China that was packed in the U.S.

Some fish are more likely to be mislabeled

With more than a third of seafood potentially mislabeled, how is a consumer to know if they are being cheated? Price, season, preparation and the specific kind of seafood all affect the chances of fraud.

Some fish are much more likely to be fraudulent, including red snapper, wild salmon, grouper and Atlantic cod. Others, such as tuna, may have mysterious origins due to lack of information on the label, which sometimes simply says "fish" without specifying what kind.

Multiple independent sources have found the majority of red snapper are not the Gulf of Mexico fish, *Lutjanus campechanus*, but are in fact another kind of snapper, a rockfish, or any number of unrelated fish. Estimates of red snapper fraud range as high as 77 percent (Marko et al. 2004) or even 90 percent (Logan et al. 2008), as a proportion of DNA-tested fish.

Wild salmon and farmed salmon are not always visually distinguishable (Megdal et al. 2009). Since Atlantic salmon is commercially extinct in the wild, all Atlantic salmon in the supermarket comes from aquaculture. Salmon labeled "farmed" is most often Atlantic rather than one of several species of wild Pacific salmon, though this is no longer universally true. Dietary supplements and/or artificial dyes now closely match the color of aquaculture salmon to meet consumer expectations. Yet the large difference in price tempts many to sell farmed salmon as "wild-caught" (Rasmussen and Morrissey 2009) as often as 56 percent of the time, as found in a study by Consumer Reports (2006).

Several kinds of tuna are sold under one name, including yellowfin, bigeye, albacore, skipjack and sometimes even bluefin tuna. Whether in cans or at a sushi bar, it can be hard to tell which tuna you are eating from the flesh or the label. Many restaurants fail to explain which species is being sold, and those selling the severely overexploited bluefin tuna often conceal its identity or confuse Atlantic and Pacific fish (Lowenstein et al. 2009, Viñas and Tudela 2009).

"A piece of tuna sushi has the potential to be an endangered species, a fraud, or a health hazard."

Lowenstein et al. 2009

Photo: Ariel da Silva Parreira

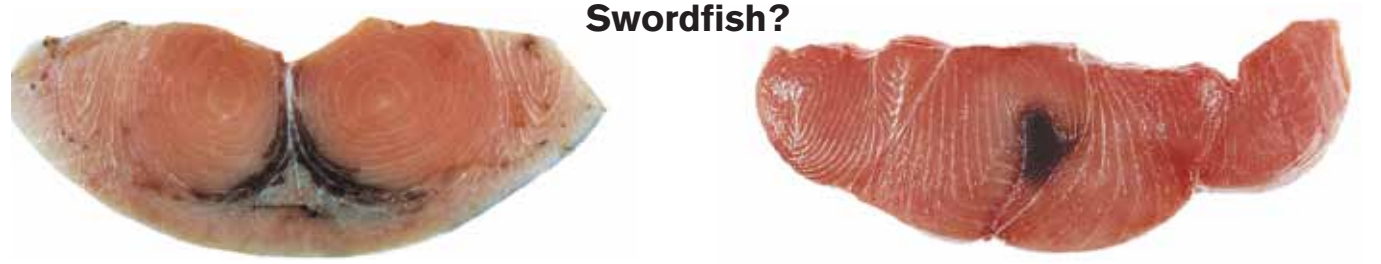
NAME THAT FISH

Fillets are one of the most easily disguised forms of fish, since many fish look similar without identifying features such as the skin, head and tail. See if you can identify which of these pairs of fillets is accurately labeled. For extra credit, name the true identity of the fake. For example, only one of the first pair of fillets is Atlantic cod, while the other is an unrelated species of fish. Can you tell the difference? Answers at the bottom of the page.

Atlantic cod?

Grouper?

Swordfish?



Red Snapper?

Wild Salmon?

Fillet photos: NOAA

Answers: *1. Left photo is escolar or oilfish. 2. Left is Nile perch. 3. Right is mako shark. 4. Right is rockfish. 5. Left is farmed Atlantic salmon*

"Anonymity through processing is one of the reasons why seafood fraud is so widespread on the U.S. market."

Photo: Roger Wong

Processed seafood is more likely to be fraudulent

Processing removes the skin, head, and other parts of a fish used for identification. This means whole fish are more readily identifiable, while fillets and prepared seafood offer more opportunities for fraud (Buck 2007). Anonymity through processing is one of the reasons why seafood fraud is so widespread in the U.S. market, since most fish are processed before being imported. Only about one fifth of imports to the U.S. arrive as whole or gutted fish (Rasmussen and Morrissey 2009).

Anglerfish are more likely to be mislabeled when sold in processed products (68 percent) than as whole fish (31.25 percent) (Espineira et al. 2008). Importers of illegally caught Patagonian toothfish may selectively import frozen fillets instead of whole fish to evade border controls (Roheim 2008).

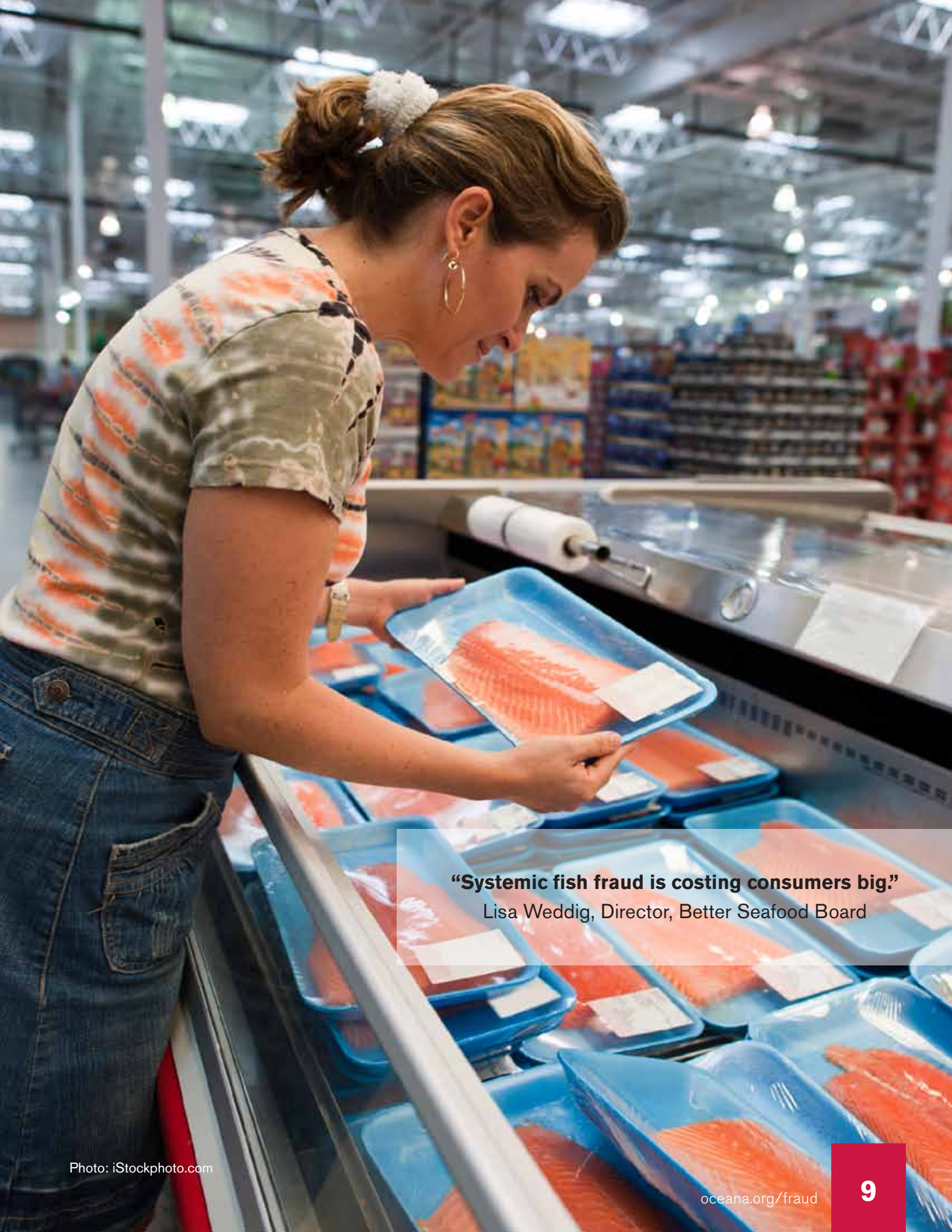
Squid is easy to disguise because it is sold primarily in rings. More expensive *Loligo* species are often replaced with cheaper squid including *Illex* shortfin squid, flying squid, and jumbo Humboldt squid (Mafra et al. 2008).

Processing can also mask the identity of shellfish, as illustrated by the confusion caused by restaurant chain Rubio's "lobster burritos" which were found to contain the less well-known langostino (Skidmore 2005). Clams are also vulnerable to seafood fraud because they are often combined with other ingredients and sold without shells. The most popular species is the grooved carpet shell clam, *R. decussatus*, but many other species of clams are sold falsely by this name (Mafra et al. 2008).

EXAMPLES OF COMMONLY MISLABELED SEAFOOD

You Purchased	You Received
Red Snapper	Slender Pinjalo, Channel Catfish, Rockfish, Tilapia, Nile Perch, Mahi Mahi, Mullet Snapper, Malabar Blood Snapper, Atlantic Cod
Mahi Mahi	Yellowtail
Grouper	Channel Catfish, Hake, Tilapia, Alaska Pollock, Nile Perch
Wild Salmon	Farmed Salmon
Swordfish	Mako Shark
Bluefin Tuna	Bigeye Tuna, Yellowfin Tuna
Albacore/White Tuna	Mozambique Tilapia, Escolar
White Snapper	White Hake
Atlantic Cod	Alaska/Norwegian Pollock, Whiting, Pollack, Saithe, Oilfish, Escolar
Chilean Sea Bass	White Bass, Striped Bass
Shark Meat	Nile Perch
Red Drum	Black Drum
Halibut	Sea Bass, Deep-water Cape Hake
Haddock	Saithe
Anchovies	Icefish
Orange Roughy	Oreo Dorey, John Dorey
Red Mullet	Spotted Goatfish
Red Drum	Black Drum
Monkfish	Pufferfish

Jacquet and Pauly 2008, Lowenstein et al. 2009, Wong and Hanner 2008, Miller and Mariani 2010, CBC News.



"Systemic fish fraud is costing consumers big."
Lisa Weddig, Director, Better Seafood Board

Photo: iStockphoto.com

SEAFOOD IS TRADED GLOBALLY

Illustration: G-Point Gallery

Seafood is traded internationally more than any other food, and the U.S. imports more seafood than any other nation (Smith et al. 2010, Brown et al. 2009). Today's seafood is flown around the globe for processing after being caught or farmed, often crossing several international borders before reaching the end consumer. Increasing complexity and globalization of seafood markets have exacerbated fraud, both deliberate and unintentional (Espineira et al. 2008). Eating unfamiliar or misidentified fish can expose consumers to new risks that formerly were confined to specific geographic areas, such as ciguatera poisoning from tropical fish, which causes chronic pain, nausea, weakness and numbness (Kipping et al. 2006).

Illegal fishing operations exploit this complex system by combining illegally caught fish with legal catches during processing and distribution, effectively laundering their product by the time it shows up on the shelf (Roheim 2008). In addition to mislabeling and smuggling of illegally caught fish, other forms of seafood fraud include falsifying documentation, bribery and corruption. False documentation in the supply chain includes reusing documents from other shipments (Sovacool and Siman-Sovacool 2007), and including false information on a seafood shipment's origin.

Global competition between seafood products that formerly were sold in isolated local markets has increased the pressure to lower prices and provide consistent products year-round. As seafood consumption increases in Asia, particularly in China, global demand is likely to increase seafood prices in the U.S. (Liu 2011). These factors are powerful incentives to substitute lower-priced fish and unknown species, particularly in the off season. One study found that fraud involving sale of farmed salmon in place of wild salmon was most common during the off season, when wild salmon are less widely available (Consumer Reports 2006).

MYSTERY COD, FROZEN FILLETS

This package of "Natural Sea Premium Cod Fish Fillets" from Whole Foods supermarket has very little information on it — not even a "Product Of" indicator. It does say it contains cod from the North Atlantic Ocean and is distributed by Natural Food Systems out of Connecticut. Natural Sea does not have its own website, and neither does Natural Food Systems, but after some internet searching I am eventually able to find out that both of those operators are now part of the United Natural Foods, Inc. (UNFI) empire. Unfortunately, there is extremely limited information on the UNFI website. I call the general number for the distributor location in Connecticut and eventually am forwarded to someone who says that she will do some digging and call me back — but she never did.

Photo: Oceana/Emily Shaffel

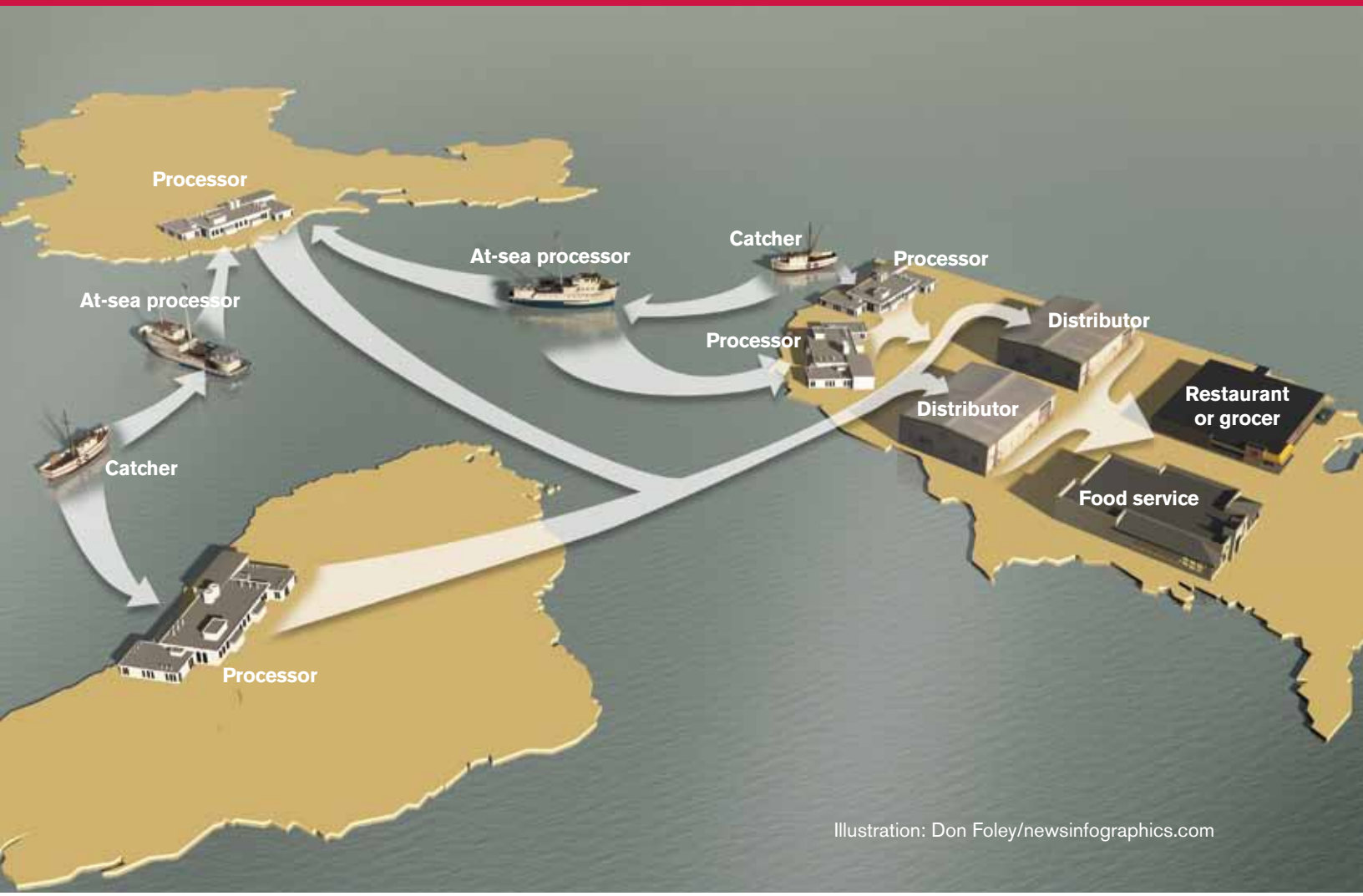


Illustration: Don Foley/newsinfographics.com

Where does our seafood come from?

All of the seafood sold in the U.S. is either caught by fishing vessels or raised in aquaculture facilities. Fish and shellfish are put on ice or flash-frozen on board the vessel or at the aquaculture facility. During primary processing, the head and guts of the fish are removed, making it easier to transport and prevent spoilage.

At this point, the vessel may take its catch to shore for processing on land. However, for many fisheries, giant at-sea processing vessels collect seafood from many catcher vessels, then head and gut the fish while crossing the ocean. These at-sea processors and transport vessels frequently deliver fish to large plants in countries where labor is cheap to begin secondary processing of the fish.

Secondary processing includes thawing the fish to allow trimming, deboning, breading, cooking, and packaging for wholesale or retail sales. At this stage, the fish is refrozen and labeled as a "product of" the country where processing takes place, often omitting where it was farmed or captured.

Finally the seafood meal is exported to the U.S. and enters the same product supply chain as most prepared foods, where it may be thawed again to sell in ready-to-eat form. Domestically produced seafood follows a similar supply chain, but may have a shorter distance to travel.

Seafood is often sold through specialty distributors or may be sourced nationwide by a broadline distributor such as Sysco or Aramark. Wholesale and retail food service establishments, including restaurants, grocery stores, cafeterias, hospitals and institutions, then sell seafood to consumers.

ECONOMIC INCENTIVES FOR SEAFOOD FRAUD

Seafood fraud can happen at each step of the supply chain. Mislabeled fish found in restaurants may have been mislabeled by the restaurant, but the restaurant may rely on the distributors, who may change the label and the price to increase their profits. Packaging or processing can also create opportunities for mislabeling.

Mislabeling is driven in part by economic incentives to imitate a more expensive product or avoid tariffs on particular species. Other forms of fraud include adding excess breading, ice or salt water to seafood in order to get away with selling smaller quantities of fish than advertised, known as short-weighting.

The process of short-weighting happens at various stages along the fish processing line. Seafood is typically glazed with ice in order to keep the product fresh. Operators are not supposed to add extra ice or include the weight of the ice in the total net weight, which provides less seafood for more money (Buck 2007). Investigations in 17 states across the U.S. found more than 21,000 packages where up to 40 percent of the seafood product's weight was ice, leading consumers to be overcharged as much as nine dollars per package (National Conference on Weights and Measures 2010).

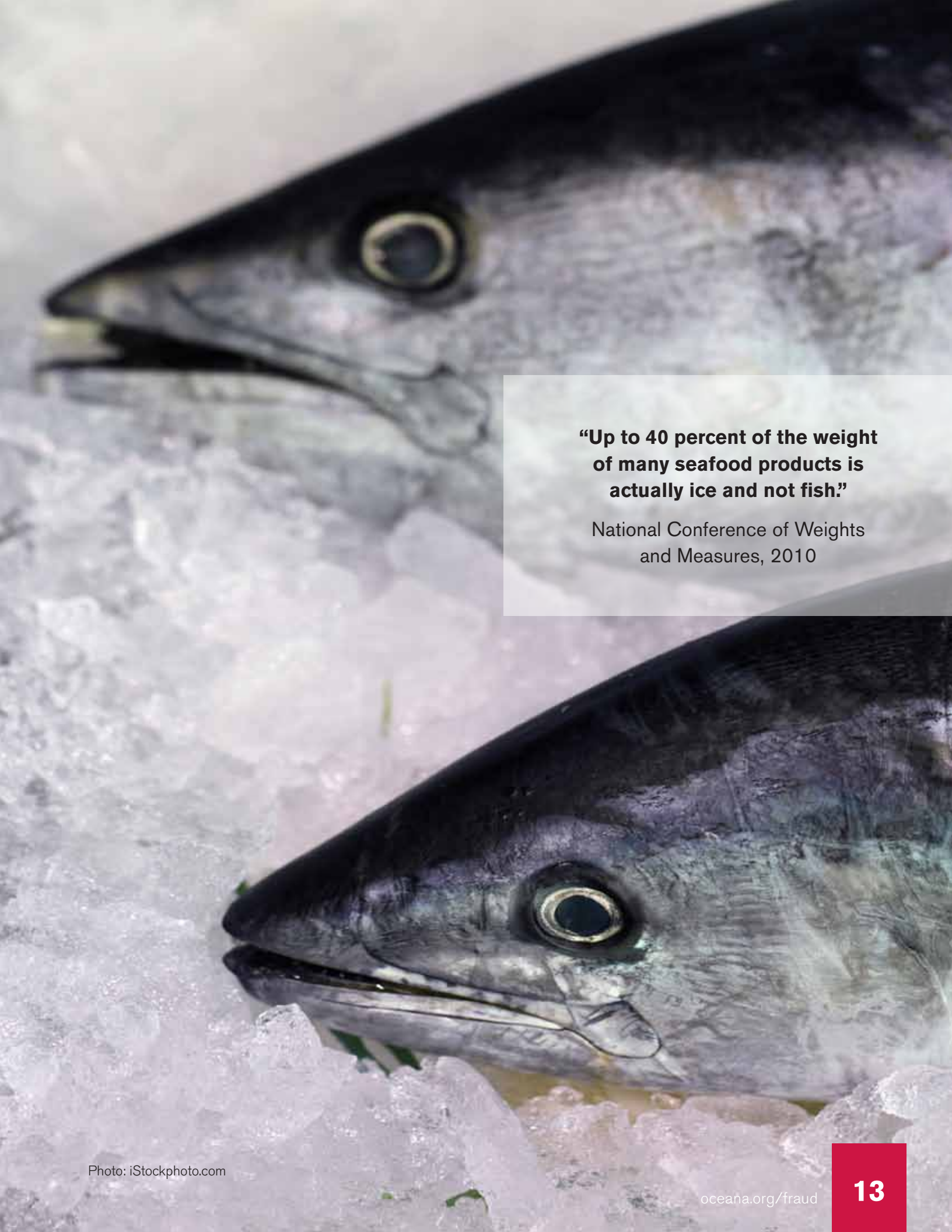
Photo: iStock.com/Cristian Lazzari

"...breaded shrimp are supposed to contain at least 50 percent shrimp, but in some cases are overbreaded to give the consumer less shrimp."

MYSTERY TUNA, READY TO EAT

Photo: Oceana/ Emily Shaftel

This vacuum-packed package of "Bumble Bee Premium Light Tuna in Water" from Giant supermarket specifies it is light tuna, a product of Thailand, and distributed by Bumble Bee Foods out of San Diego, CA. From the Bumble Bee website, I determine that light tuna is most often caught with purse-seines, and that it is steam-baked before being packaged. I cannot find out the exact species of the tuna, although they suggest a few varieties that may be packaged under the label "light tuna." There is no phone number listed anywhere on the package or even on Bumble Bee's website — my only options are to email or snail-mail Bumble Bee, making it the hardest-to-reach company of any of the vendors I investigated. I email the company through the "Contact Us" page and receive a reply the next day informing me that the tuna is wild-caught, probably in the Atlantic, Indian or Pacific Oceans, and that Bumble Bee labels canned tuna with the country where the fish is canned. However, I remain unenlightened as to the species, catch date, vessel, fishing gear or processing details I seek.



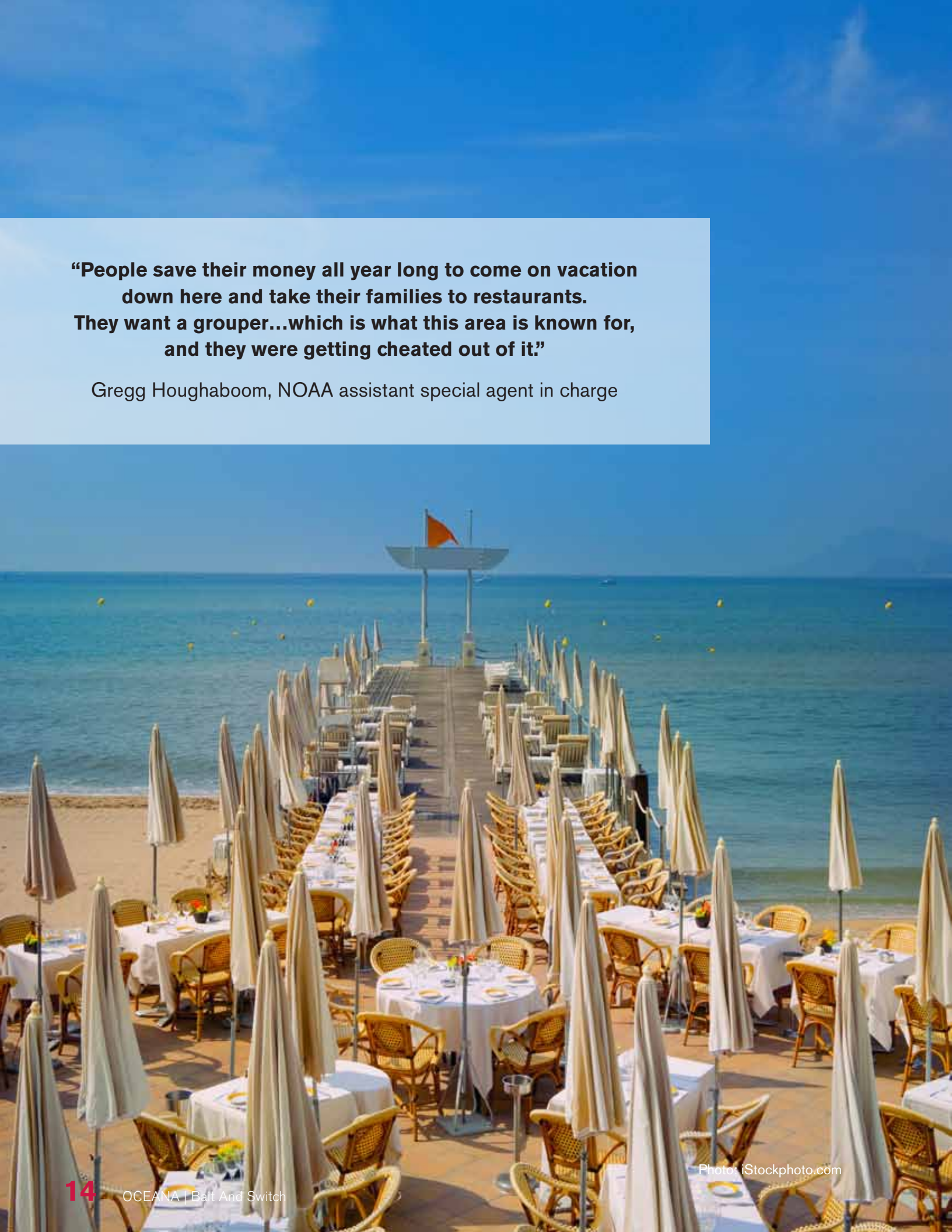
"Up to 40 percent of the weight of many seafood products is actually ice and not fish."

National Conference of Weights and Measures, 2010

Photo: iStockphoto.com

“People save their money all year long to come on vacation down here and take their families to restaurants. They want a grouper…which is what this area is known for, and they were getting cheated out of it.”

Gregg Houghaboom, NOAA assistant special agent in charge



Photos: iStockphoto.com

"Seafood fraud is based on supplying the consumer with something different from and inferior to the product expected."

Eugene Buck, Congressional Research Service

Photo: Megan Stevens

The breading used in seafood processing can also be a contributing factor in short-weighting. For example, breaded shrimp are supposed to contain at least 50 percent shrimp, but in some cases the extra breading results in the consumer receiving less shrimp than they paid for (Buck 2007, GAO 2009). An Auckland seafood company, Shore Mariner Limited, was convicted and fined $2,000 plus costs on March 23, 2009 for short-weighting their seafood products (New Zealand Ministry of Consumer Affairs 2009).

At the beach or in coastal cities, local fish markets and restaurants increasingly struggle to maintain a year-round supply of the most popular fish. The lack of local seafood is often worsened by overfishing and by a lack of awareness among consumers that fish catches are seasonal. In markets where local fish are desirable, imports may be claimed as local fish to fill gaps in availability, increase sales or charge a higher price.

Though cumulative economic losses from seafood fraud are unknown, even small changes in price add up to major losses for retailers and consumers. Illegally caught fish evade inspection fees, permits, and other business costs that affect the price of responsibly-caught seafood. The costs of fraud are passed on to customers (both wholesale and retail) and to the government agencies enforcing tariffs on imported seafood.

THE COST OF SEAFOOD FRAUD

1,200 pounds of fresh rockfish was imported for sale as red snapper for illegal profits of $12,600 before being detained by U.S. government officials (Foulke 1993, Jacquet and Pauly 2008).

45,000 pounds of inexpensive oreo dory were imported from New Zealand for sale in Ohio for illegal profits of $150,000 before being detained by U.S. government officials. Orange roughy sells for four dollars more per pound than oreo dory (Foulke 1993, Jacquet and Pauly 2008).

3,000 packs of grilled eel were falsely labeled as originating in Japan instead of China and sold to a wholesaler in Tokyo for 1.71 million Japanese yen in 2008, nearly twice the price that would be paid for Chinese eel (Kyodo News 2009).

One international retailer was caught substituting other fish for 43 percent of its cod in Ireland stores for illicit profits between $533,000 and $733,000 per year (Miller and Mariani 2010, TNS Worldpanel Ireland 2009).

Vietnamese catfish, also known as basa or tra, was sold as grouper to evade tariffs of more than $63 million in 2010. Prices for catfish sold as grouper were up to $25 per meal in Kansas City, Baltimore, and Tampa. At least ten million pounds of frozen catfish were sold as grouper and sole in the U.S. in just one year (NOAA 2007).

Illustrations: Zel Stoltzfus

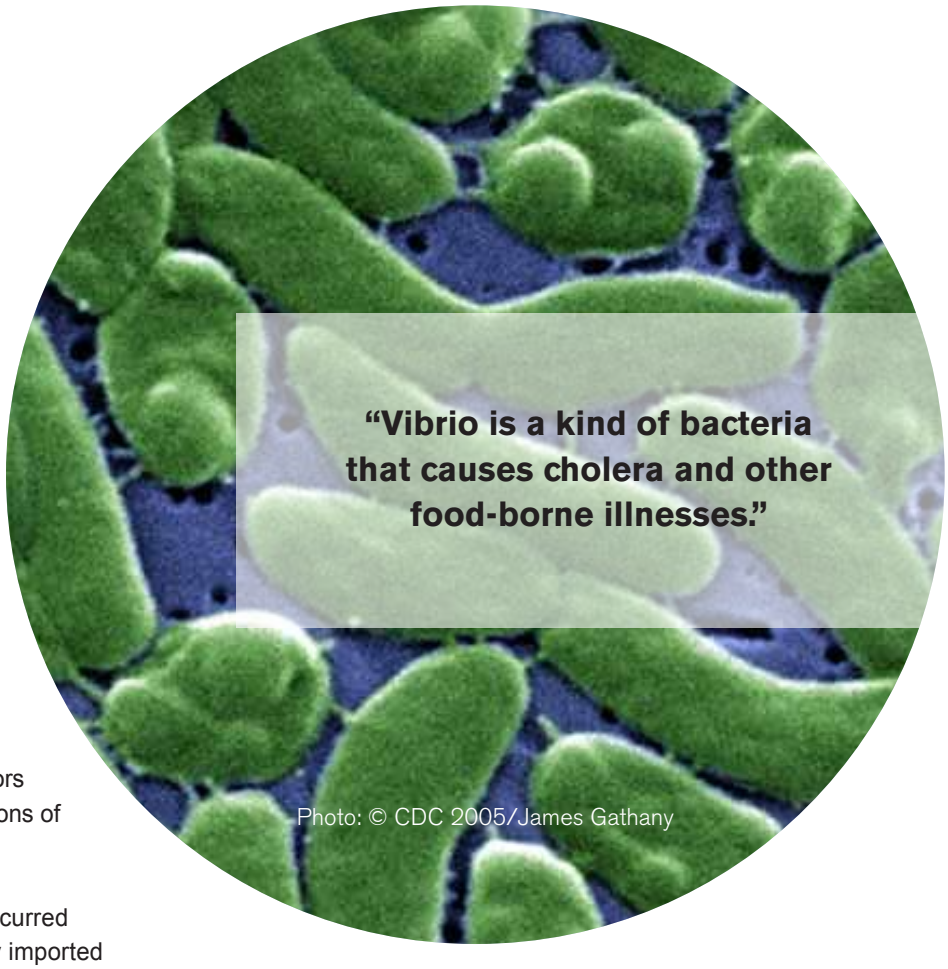
HUMAN HEALTH AND SEAFOOD

In some cases, seafood fraud can directly threaten human health. Seafood in general is extremely sensitive to proper handling and refrigeration, and in some cases can cause severe illness if not handled properly. Swapping one fish species for another that may be riddled with contaminants, toxins or allergens can make people sick (GAO 2009). In recent health scares from eggs and other non-seafood products, voluntary recalls were used to limit the damage; yet this can be impossible for seafood because the origin of fish is often unknown by the time it reaches our plates.

Seafood is a high risk food

While seafood can offer health benefits, it can also be a high risk food when not safely handled or sourced. Finfish outranked all other commodity food groups in the total number of 2007 outbreaks caused by a single food (CDC 2010). Of these seafood-borne outbreaks, naturally occurring marine toxins, such as histamines in tuna or ciguatera in reef fish, accounted for 80 percent of the total number (CDC 2010). Seafood containing natural toxins may show no sign of spoilage, and "frequently looks, smells and tastes normal" (CDC 2005). Impacts from pollution with mercury, lead, PCBs, and dioxin are more difficult to quantify (Becker and Upton 2009). Nearly all fish and shellfish contain traces of mercury, and some contain higher concentrations of mercury that can be harmful, particularly for pregnant women and young children (FDA and EPA 2004).

Most food poisoning is caused by harmful bacteria (HHS 2011). Of the bacteria and viruses that most commonly cause food poisoning, many can be associated with seafood either directly (*Vibrio*, Norovirus, *Listeria*, *B. cereus* and botulism) or indirectly through contaminated water (*E. coli*, *Campylobacter*, Hepatitis A and *Staphylococcus*) (HHS 2011). Additionally, seafood accounted for 68 percent of Salmonella and 22 percent of *Listeria* contamination violations in all imported foods that were rejected by FDA from 1998-2004 (Buzby et al. 2008). Consumers with weakened immune systems are particularly at risk for infections and are advised not to eat raw seafood (CDC 2005).



Additional health risks of seafood fraud

Globalization of our food supply brings a much wider variety of seafood to U.S. tables than in the past. When seafood is mislabeled, a broader array of potential contaminants, pathogens, and allergens may be covered up. With increasingly centralized and nationwide distribution systems, even small errors "can result in shipment of contaminated food to millions of customers" (Maki 2009).

One health concern is ciguatera, which formerly occurred primarily in tropical regions, but is now increasingly imported along with the large reef fish that carry this form of food poisoning (Lehane and Lewis 2000). Ciguatera, one of the most frequent forms of food poisoning from seafood (Hokama 1993), can last for weeks or even months, with symptoms including pain, nausea, diarrhea, cramps, numbness, tingling, weakness, irregular heart rate, blurred vision and even reverse temperature sensation — where hot feels cold and vice versa (Fleming 2011). Ciguatera can be debilitating, with severe neurologic symptoms, and may recur throughout a person's life (Fleming 2011).

Selling farmed fish as wild or vice versa can result in different and potentially higher health risks for consumers. For example, fish raised in aquaculture pens can carry antibiotics and dyes that would not be present in wild fish. In some cases, much higher levels of certain contaminants are found in farmed salmon (Hites et al. 2004a, b, Foran et al. 2005). Chemical contamination is also higher for farmed sea bass (Fernandes et al. 2009), though the difference in heavy metals between wild and farmed fish appears less pronounced (Hites et al. 2004a, b, Foran et al. 2005, Jardine et al. 2009). The use of antibiotics in aquaculture can also lead to the spread of drug-resistant bacteria in species such as catfish (Sarter et al. 2007, Akinbowale et al. 2006).

Hidden allergens can be fatal

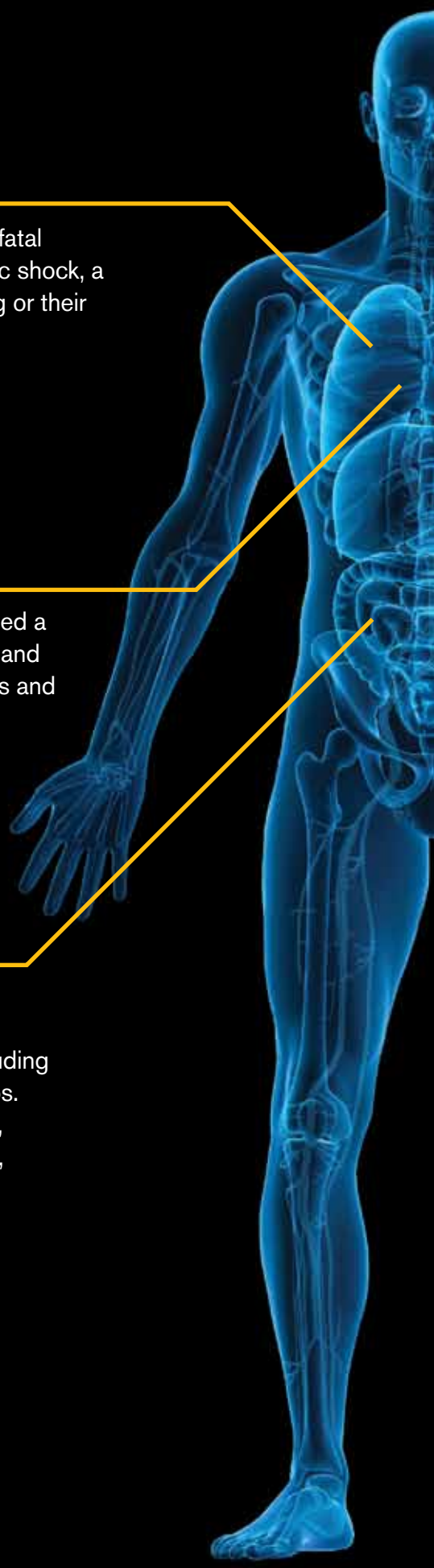
Allergens may be the most life-threatening risk of seafood fraud. Fish and shellfish are among the most common food allergies in the U.S., along with peanuts and tree nuts (HHS 2011). Failure to declare potential allergens involving shellfish, shrimp, and other species is considered an emerging problem for public health (Mafra et al. 2008). The World Health Organization has identified crustaceans, including lobster, crabs, and shrimp, as key allergens that must be identified on packaged foods based on how common severe allergic reactions can be (Mafra et al. 2008, WHO 2006).

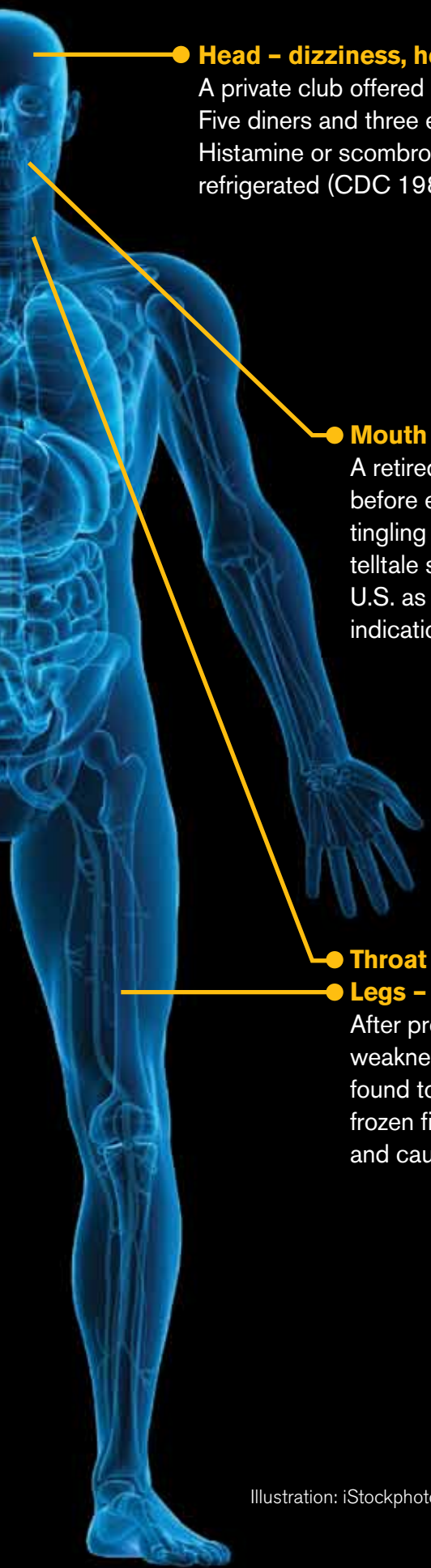
HEALTH RISKS OF SEAFOOD FRAUD

Lungs – difficulty breathing from allergic reaction
A Georgia man severely allergic to crab was served a chicken dish with the fatal ingredient. After unknowingly eating the crab, the man went into anaphylactic shock, a life-threatening allergic reaction that can cause the sufferer to stop breathing or their heart to stop beating (Associated Press 2008, PubMed Health 2010).

Heart – rapid heart rate from histamine poisoning
During lunch at a restaurant in Charleston, South Carolina, two people noticed a peppery or metallic taste to their fish. An hour later, five people between 18 and 64 years old became ill. With symptoms from rapid heart rate to feverishness and stomach pain, several were headed to the emergency room (CDC 1989).

Gut – diarrhea, cramps from indigestion
More than 600 people in Hong Kong spent extra time in the bathroom and eventually the hospital after purchasing Atlantic cod which was actually mislabeled escolar, also known as oilfish. Escolar can cause symptoms including oily bowel discharge, severe diarrhea, nausea, vomiting, and stomach cramps. Escolar is sometimes mislabeled as white tuna, super white tuna, rudderfish, butterfish, walu, cod, orange roughy and sea bass (Jacquet and Pauly 2008, Lam 2007, Queensland Government 2010).





Head – dizziness, headache from histamine poisoning

A private club offered a lunch buffet including frozen mahi mahi from a distributor in Chicago. Five diners and three employees became ill with a headache, dizziness, and other symptoms. Histamine or scombroid poisoning is associated with tuna and related fish when not properly refrigerated (CDC 1989).

Mouth – temperature reversal from ciguatera poisoning

A retired realtor enjoyed a succulent broiled grouper in a Texas restaurant before experiencing strange neurological symptoms. She suffered painful tingling and sensory confusion that reversed the feeling of hot and cold – a telltale sign of ciguatera poisoning. Ciguatera is more and more common in the U.S. as large reef fish are increasingly imported from tropical regions with little indication of their origin (Aleccia 2009, Lehane and Lewis 2000).

Throat – difficulty speaking from tetrodotoxin

Legs – paralysis from tetrodotoxin

After preparing fish soup for her family, a Chicago woman suffered chest pain, weakness, and tingling around her mouth. The "monkfish" she purchased was found to be toxic pufferfish that can only be eaten when specially prepared. The frozen fish was imported through California, processed in China, labeled in Korea, and caught in an unknown location (Cohen et al. 2009).

Illustration: iStockphoto.com/Comotion Design

CONSERVATION RISKS OF ILLEGAL FISHING

Seafood fraud undermines conservation efforts to prevent overfishing and incidental capture of at-risk species by making illegal fishing profitable. With widespread mislabeling of fish species, legitimate businesses are losing hard-earned profits and consumers are prevented from making eco-friendly choices. Concealing illegally caught fish through at-sea transfers, falsified documentation and underreporting makes responsible fisheries management harder for governments around the world.

Seafood fraud makes destructive fishing profitable

Seafood fraud creates a market for illegal fishing by making it easy to launder illegally caught seafood products. These fish typically come from vessels violating international conventions formed to prevent overfishing, deter destructive practices and protect areas and animals in need of conservation.

Illegal fishing worldwide is estimated to be about one fifth of reported catches, reaching up to 37 percent in the hardest-hit regions such as the Eastern Central Atlantic off the coast of Africa (Agnew et al. 2009). The U.S. is one of the largest markets in the world for selling both legitimate and illegally caught seafood, along with the European Union, Japan and China (Liu 2011). The U.S. may also be an easy target for dumping illegal, poor quality or unpopular seafood because import controls are few and far between.

The most blatant form of seafood fraud is to mislabel a fish fillet as the wrong species, frequently completely different from its actual identity. One notorious smuggler bribed 18 South African fisheries officers and disguised two metric tons of illegally caught Patagonian toothfish (also known as Chilean sea bass) under a thin layer of spiny lobster (Hauck and Kruse 2006, NET 2004). Intentional mislabeling is commonly used to cover up a wide range of corrupt and illegal practices.

HOW ILLEGALLY CAUGHT FISH ENTER THE MARKET

Illustration: Zel Stoltzfus

Photo: Oceana/Carlos Suárez

All conservation measures are harmed by illegal fishing

Almost any conservation measure that exists is vulnerable to illegal fishing. Illegal fishing undermines conservation measures by catching juvenile fish or more fish than the allowed quota, failing to comply with protective measures for endangered species, fishing during closed spawning seasons, in protected areas, or without a permit. After the fish is caught, additional illegal activity includes fabricating or failing to report catches, lack of sanitary handling, transferring fish at sea or at night to prevent detection, and selling fish disguised as another species.

At-sea transfers are one of the primary weak points in schemes to prevent illegal fishing. Illegally caught fish may be transferred at sea to a larger vessel and combined with legal fish (Buck 2007, EJF 2007, Roheim 2008). If this vessel delivers its load to a processing facility in China or another third country, all of the fish will be packaged and re-exported as a “product of China” with no information on their true origin (Roheim 2008). The U.S. market is especially vulnerable to this kind of fraud because the government does not require traceability of fish and mislabeling is often used to fool consumers.

Fisheries management around the world depends on a steady stream of information on the hundreds of species being caught, as well as the financial and regulatory capacity to enforce the law. “Many…states have little regulatory or financial capacity to monitor vessels” (Sovacool and Siman-Sovacool 2007).

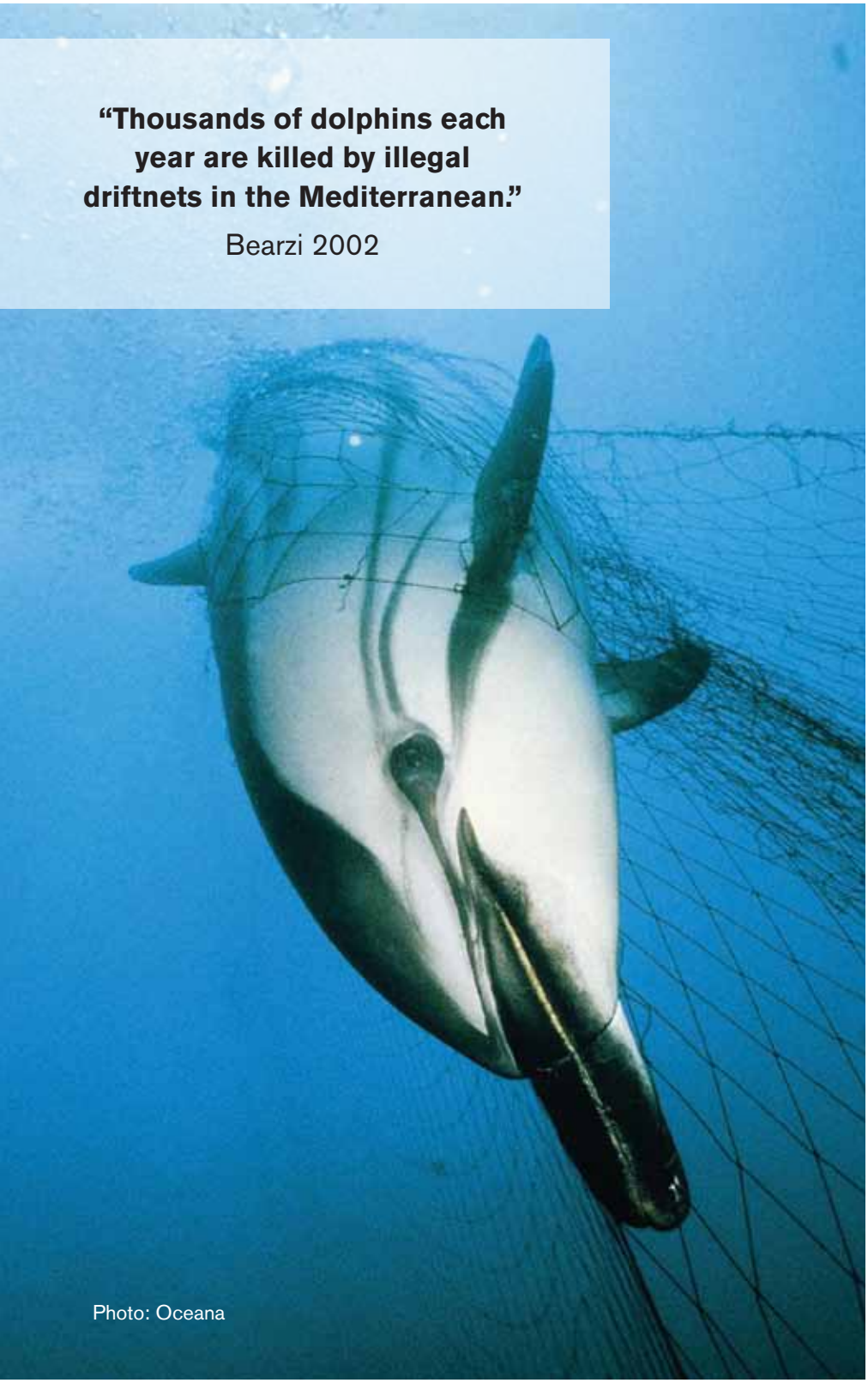
Species at risk can be harmed by seafood fraud

Regulatory measures such as catch limits, which help reduce overfishing, are some of the restrictions that illegal fishing seeks to avoid. Some reports suggest that in England, fishermen who catch cod exceeding the quota label the fish as "ling" to facilitate illegal sales (Clover 2006).

Incidental catches of prohibited species may also be disguised, as with tanner crabs caught illegally through the Alaskan snow crab fishery (Smith et al. 2005). Swordfish labeled as from the U.S. fishery may actually have been caught by another fishery using more destructive and cheaper gear that catches many more threatened or endangered sea turtles. Mislabeling also cuts into profits for U.S. swordfish fishermen.

Seafood fraud can also disguise underreporting, as revealed by a study of misidentified hake appearing in U.S. and European markets (Garcia-Vazquez et al. 2009). Underreporting and false reporting designed to cover up illegal activity is one reason for failed efforts to rebuild overexploited fish stocks (Marko et al. 2004). For example, independent reviews of the Mediterranean bluefin tuna fishery estimated that illegal catches of bluefin were twice the legal catch and several times greater than the scientific recommendations (WWF 2008). These illegal catches alone could be enough to prevent recovery of the species from overexploitation.

Photo: Tony Rath/Naturalight Productions



Fraud undermines consumer-driven conservation efforts

Market-driven conservation efforts depend on the consumer’s ability to make an informed purchase of a particular species. For example, guides that advise on which species are most environmentally friendly to eat rely on the consumer being able to choose one species over another. This effort becomes impossible when fish are mislabeled. For example, following European campaigns against shrimp aquaculture, processors began exporting farmed shrimp from Thailand labeled as wild-caught (Miller 1999 in Sumaila and Jacquet).

Seafood fraud misleads consumers, not only about their specific purchases but also their perception of the true availability of seafood and the state of the marine environment.

Because mislabeling maintains the appearance of a steady supply of popular fish species despite severe overfishing, the general public is unaware that the species is in serious trouble (Miller and Mariani 2010). For example, continuing consumer demand for cod creates powerful incentives that lead to substitution of more common but less expensive species such as pollock. In one study, nearly 30 percent of all cod samples and over 90 percent of smoked samples were mislabeled (Miller and Mariani 2010). Other white fish are also commonly mislabeled, including up to 30 percent fraudulent labeling of hake in the U.S. and Europe (Garcia-Vazquez et al. 2011, Machado-Schiaffino et al. 2008).

“Hundreds of thousands of sea turtles are caught and killed by longlines each year. Many longlines operate illegally in remote island nations where enforcement is lacking.”

Lewison et al. 2004, Souter et al. 2009

Photo: Oceana/Carlos Pérez

"Illegal activity also deflates the price of grouper in the Gulf of Mexico…We are doing what we can to protect the honest grouper commercial fishermen."

Gregg Houghaboom, NOAA assistant special agent in charge

Photo: Oceana/Carlos Minguell

SEAFOOD INDUSTRY CONCERNS ABOUT FRAUD

Seafood fraud undermines responsible fishing practices by creating a market for illegally caught products and undercutting prices for law-abiding fishermen. In the long term, corruption has a chilling effect on economic activity (Eigen and Eigen-Zucchi 2003). Worldwide, illegal fishing is estimated to cause economic losses between 10 and 23.5 billion dollars annually (Agnew et al. 2009).

Corruption may also depress prices for fish, because poachers are in a hurry to quickly dump illegal product before they are discovered (Sovacool and Siman-Sovacool 2007). This periodic flood of illegal fish into the market also destabilizes prices, making it more difficult for legitimate businesses to turn a profit. For illegal toothfish, economic losses of $6,000 are estimated for every ton sold on the black market (NOAA 2011).

The National Fisheries Institute (NFI), the leading trade group promoting seafood in the United States, has set up the Better Seafood Board to help self-police the industry. As described on the NFI website, "the Better Seafood Board (BSB) was formed in 2007 to support the commitment of NFI members to abide by industry principles of economic integrity by not selling seafood that is short in weight or count, that has the wrong name, or that has been transshipped from one country to another to circumvent duties and tariffs." Increasingly, members of the seafood industry are calling for systems that can provide both government and consumers the information they need to ensure that seafood sold in the United States is safe, legal, and honestly labeled.

TECHNOLOGY EXISTS FOR TRACEABILITY

The European Union has now established a system of catch certification that has as its goal the elimination of imported or exported illegal fish. The Marine Stewardship Council, the largest private certifier of so-called "sustainable" seafood, requires full traceability from ship to consumer for all species certified under its program.

A number of major seafood providers, including Walmart and Sodexo, have committed to selling only MSC certified seafood, which means that their seafood will be traceable from ship to consumer. A number of companies are using traceability systems such as TraceRegister and String. The time is clearly ripe for the U.S. to put in place a system that ensures every consumer gets exactly what they've paid for — safe, legal, and honestly labeled seafood.


Photo: iStockphoto.com/nazdravie

"Every fish must come with full traceability, so we know exactly where it came from. I want a DNA barcode. I want to know it was processed in a safe plant that paid a fair wage and treated employees properly. I want to know it is not filled with crappy chemicals or adulterated beyond all human recognition."

John Fiorillo, Industry Analyst and Editor, Intrafish

Photo: NOAA

CURRENT U.S. POLICY IS INADEQUATE

The existing federal programs to prevent and detect seafood fraud are fragmented and feeble. There is no clear legal mandate or lead agency within the U.S. Government. Moreover, federal agencies are not exercising the powers they already have to stop seafood fraud. The regulatory and enforcement activity that is occurring is uncoordinated and ineffectual (GAO 2009).

Even the most basic consumer protection, requiring seafood companies to list country of origin on labels (COOL), has been riddled with delays and loopholes. After years of delay, the USDA issued COOL regulations covering seafood in 2009 (Jurenas 2010). However, the exceptions and exclusions in the regulations are so extensive that it is likely that less than 25 percent of the seafood consumed in the United States is even subject to COOL labeling requirements (W.Preston pers.comm.).

Fragmented regulatory system

No single federal agency is in charge of combating seafood fraud. Instead, it is left to a number of different federal agencies implementing a patchwork of overlapping and outdated laws. Labeling and advertising are divided between the Food and Drug Administration (FDA) and Federal Trade Commission. The FDA has responsibility for ensuring the safety and proper labeling of seafood sold in the United States, largely stemming from the federal Food, Drug and Cosmetics Act of 1938 (FDCA). However, false advertising of seafood products is regulated by the Federal Trade Commission under the Federal Trade Commission Act.

Regulation and policing of imported seafood falls to both the FDA and U.S. Customs and Border Protection. NMFS's primary role with respect to seafood fraud is the voluntary seafood inspection program it operates under authority of the Agricultural Act of 1946. The United States Department of Agriculture has authority for implementing COOL requirements, including those for seafood, under the Agricultural Marketing Act of 1946 and the Tariff Act of 1930.

Photo: NOAA

"There are several actions that FDA can take if seafood fraud is discovered…FDA, however, has not taken any of these actions for seafood fraud violations since 2000."

GAO 2009


Photo: NOAA

Lack of inspection and enforcement

Current efforts by the federal government to combat seafood fraud are wholly inadequate. There is no comprehensive inspection system comparable to even the most basic requirements for meat and poultry. The lead federal agency in charge, the FDA, publicly acknowledges that it devotes "minimal resources to detecting and preventing fraud" (GAO 2009). Even more concerning, enforcement efforts are virtually nonexistent.

The FDA's inspection and enforcement efforts all but ignore seafood fraud. Its oversight program for seafood processors, the Hazard Analysis & Critical Control Points program (HACCP) for fish and fisheries, does not include measures to identify and mitigate seafood fraud (FDA 2001). Although over 80 percent of the seafood consumed in the United States is imported, the FDA inspects only two percent of this imported seafood for health and safety risks and a miniscule .001 percent for seafood fraud (GAO 2009). As noted in a scathing review by the Government Accountability Office (GAO), the FDA has also failed to take advantage of the authority given to it under the Food Allergen Act of 2004, which requires that seafood species be included on product labels to notify consumers who might be allergic to a particular species. This could be used to help detect and prevent species substitution (GAO 2009).

The FDA's enforcement efforts against seafood fraud are similarly anemic. FDA has the legal authority to prevent imported seafood from entering the United States if it appears to be mislabeled or otherwise fraudulent. Only one percent of FDA's refusals of imported seafood were related to seafood fraud (GAO 2009), even though estimates suggest more than a third of imported seafood is mislabeled (Buck 2007). FDA also has a broad range of enforcement powers against seafood fraud by companies ranging from warning letters to seizing seafood to obtaining injunctions. Yet the FDA failed to pursue any of these enforcement actions to fight seafood fraud from 2000-2009, according to the government-issued GAO report (2009).

NMFS's seafood inspection program is larger than FDA's and is estimated to cover about one-third of the seafood consumed in the United States. But the NMFS inspection program does not adequately detect or deter seafood fraud for a number of reasons. First, it is voluntary and unlikely to include companies that are engaged in seafood fraud. Second, it is generally used by big seafood buyers to ensure that their supply is accurate in terms of weight, freshness and safety. No comprehensive records of inspections are maintained, and it is unclear that this program is ever used to detect seafood fraud such as species substitution (T. Hansen pers.comm.).


Photo: NOAA

HOW TO STOP SEAFOOD FRAUD

Track and Trace Seafood
Fish and seafood information needs to be tracked through every step of the process from the water to our plates. Each seafood meal should be entirely traceable through distribution and processing back to its original capture or aquaculture facility.

Prevent Mislabeling and Provide Information to Consumers
Mislabeling is rampant throughout the U.S. and contributes to fraudulent practices, increased health risks, conservation impacts and illegal fishing. Mislabeling must be prevented at all steps in the distribution chain. Consumers need to be assured that the fish they are buying is safe, legal and accurately labeled.

Ensure Safety of Seafood
Seafood is a high risk food and must be handled safely with increased accountability to prevent illness. Bacterial contamination and natural toxins are particularly risky in the context of seafood fraud.

Keep Illegal Fish Out of the U.S. Market
Illegal fishing not only hurts honest fishermen, but can increase risks to consumers. If a fishing boat is not abiding by domestic or international fishing laws, it is likely to be violating other requirements, including health and safety regulations.

Implement Existing Laws
Existing laws provide many of the tools needed for the U.S. Government to crack down on seafood fraud and mislabeling and implement traceability for all fish and shellfish. The Food Allergen Labeling and Consumer Protection Act, Country of Origin Labeling, and the Food Safety and Modernization Act must be implemented fully.

Coordinate Federal Agencies
A wide range of federal agencies share responsibility for seafood safety and inspections, yet instead of adding capacity, this fragmented system currently leads to confusion and inefficiency. Coordination is needed to effectively protect consumers and unite the U.S. Government against seafood fraud.

Photo: Naomi Blinick/Marine Photobank

WHAT'S NEEDED FOR TRACEABILITY?

- **National tracking database to account for all seafood through the entire supply chain**
- **Inspections and enforcement at levels high enough to deter fraud, including DNA testing for species identification**
- **Review of tracking and inspection data for systemic problems and false documentation**
- **Transparency in labeling and full public disclosure to allow informed purchases and decision making**
- **Targeting known illegal sources of seafood to reduce the market for illegal fishing**

Photo: ARC Centre of Excellence for Coral Reef Studies/Marine Photobank

Photo: Raúl Egúsquiza

Photo: Department of Homeland Security

“Seafood needs to be tracked through every step from the water to our plates.”

Photo: iStockphoto.com

Photo: Department of Homeland Security

Photo: iStockphoto.com

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