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FDA Consumer

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Critical Steps Toward Safer Seafood

by Paula Kurtzweil

A tender tuna steak lightly seasoned with lemon pepper and grilled over a charcoal fire is one way to please a seafood lover's palate. Stuffed flounder, lobster thermidor, and shrimp scampi are others.

But blue marlin served up with a dose of scombroid poisoning or steamed oysters with a touch of Norwalk-like virus are more likely to turn the stomach, instead of treating the palate.

In 1997, 26 employees of the World Bank headquarters in Washington, D.C., developed headaches, dizziness, nausea, and rashes several hours after eating blue marlin served in their workplace cafeteria. An emergency room doctor who treated some of the victims attributed the illness to scombroid poisoning, which is caused by a toxin produced when certain fish spoil.

In 1995, the national Centers for Disease Control and Prevention reported 34 incidences of food poisoning in people who had eaten oysters harvested from certain southern U.S. waters. Health experts blamed the flu-like illness on a virus similar to the Norwalk virus, which is usually introduced into fishing areas by human sewage.

Generally, seafood is very safe to eat, says Phillip Spiller, director of the Food and Drug Administration's Office of Seafood. "On a pound-for-pound basis, seafood is as safe as, if not more safe than, other meat sources. But no food is completely safe, and problems do occur."

Spiller points out that while FDA has regulated seafood for decades, a new FDA program that went into effect in December 1997 aims to further ensure seafood's safety. This program requires seafood processors, repackers and warehouses--both domestic and foreign exporters to this country--to follow a modern food safety system known as Hazard Analysis and Critical Control Point, or HACCP (pronounced hassip). This system focuses on identifying and preventing hazards that could cause food-borne illnesses rather than relying on spot-checks of manufacturing processes and random sampling of finished seafood products to ensure safety.

This is the first time that the HACCP system is being required for the processing and storage of a U.S. food commodity on an industry-wide basis.

Seafood safety could be further ensured if seafood retailers integrate HACCP in their operations. Although seafood retailers are exempt from the HACCP regulations, FDA, through its 1997 edition of the Food Code, encourages retailers to apply HACCP-based food safety principles, along with other recommended practices. The Food Code serves as model legislation for state and territorial agencies that license and inspect food service establishments, food vending operations, and food stores.

These efforts will be accompanied by seafood safety programs already in place, such as ongoing research by FDA's seafood safety experts and others, and the National Oceanic and Atmospheric Administration's voluntary fee-for-service inspection program.

Consumers are expected to continue their role, too, choosing seafood retailers and products carefully, and handling and serving their products with care in the home.

"Consumers are a step along the way to ensuring that only safe seafood goes in the mouth," says Mary Snyder, director of programs and enforcement policy in FDA's Office of Seafood. "They have to know what they're doing."

Reducing Hazards with HACCP

Seafood can be exposed to a range of hazards from the water to the table. Some of these hazards are natural to seafood's environment; others are introduced by humans. The hazards can involve bacteria, viruses, parasites, natural toxins, and chemical contaminants.

The HACCP system that seafood companies will have to follow will help weed out seafood hazards with the following seven steps:

- Analyze hazards. Every processor must determine the potential hazards associated with each of its seafood products and the measures needed to control those hazards. The hazard could be biological, such as a microbe; chemical, such as mercury or a toxin; or physical, such as ground glass.
- Identify critical control points, such as cooking or cooling, where the potential hazard can be controlled or eliminated.
- Establish preventive measures with critical limits for each control point.
- Establish procedures to monitor the critical control points. This might include determining how cooking time and temperatures will be monitored and by whom.
- Establish corrective actions to take when monitoring shows that a critical limit has not been met. Such actions might include reprocessing the seafood product or disposing of it altogether.
- Establish procedures to verify that the system is working properly.
- Establish effective recordkeeping.

Also, under FDA's HACCP regulations, seafood companies have to write and follow basic sanitation standards that ensure, for example, the use of safe water in food preparation; cleanliness of food contact

surfaces, such as tables, utensils, gloves and employees' clothes; prevention of cross-contamination; and proper maintenance of hand-washing, hand-sanitizing, and toilet facilities.

In addition, molluscan shellfish handlers must follow a few additional rules; for example, they must obtain shellfish only from approved waters and only if they are properly tagged, which indicates that they have come from an approved source.

FDA estimates that more than half of the seafood eaten in this country is imported from almost 135 countries. The agency now requires for the first time that seafood importers take certain steps to verify that their overseas' suppliers are providing seafood processed under HACCP.

FDA periodically inspects seafood processors and warehouses. Required HACCP records will enable the agency to determine how well a company is complying over time.

The safety features of FDA's HACCP regulations are incorporated into the National Seafood Inspection Program of the Department of Commerce's National Oceanic and Atmospheric Administration. For a fee, NOAA inspects seafood processors and others, checking vessels and plants for sanitation and examining products for quality. The agency certifies seafood plants that meet federal standards and rates products with grades based on their quality. Seafood processors in good standing with the program are free to use official marks on products that indicate the seafood has been federally inspected.

Additional Protections

FDA promotes seafood safety in other ways, including:

- Setting standards for seafood contaminants. FDA has established a legally binding safety limit for polychlorinated biphenyls and guidelines for safety limits for six pesticides, mercury, paralytic shellfish poison, and histamine in canned tuna. (Histamine is the chemical responsible for scombroid poisoning.)
- Administering the National Shellfish Sanitation Program, which involves 23 shellfish-producing states, plus a few non-shellfish-producing states, and nine countries. The program exercises control over all sanitation related to the growing, harvesting, shucking, packing, and interstate transportation of oysters, clams and other molluscan shellfish.
- Lending its expertise to the Interstate Shellfish Sanitation Conference, an organization of federal and state agencies and members of the shellfish industry. The conference develops uniform guidelines and procedures for state agencies that monitor shellfish safety.
- Entering into cooperative programs with states to provide training to state and local health officials who inspect fishing areas (for example, shellfish beds), seafood processing plants and warehouses, and restaurants and other retail places.
- Working with NOAA to close federal waters to fishing whenever oil spills, toxic blooms, or other phenomena threaten seafood safety.
- Sampling and analyzing fish and fishery products for toxins, chemicals and other hazards in

agency laboratories.

FDA also does extensive seafood safety research at its Gulf Coast Seafood Laboratory at Dauphin Island, Ala., and its seafood laboratories in Bothell, Wash., and Washington, D.C.

Research projects include:

- Identifying a legally binding action level for histamine in fish to protect consumers from scombroid poisoning.
- Developing chemical indicators for detecting decomposed fish. Decomposition is now identified by organoleptic techniques, in which highly trained people use their sense of smell and sight to determine quality. Hoskin says that chemical indicators could help reduce costs of training people in this highly skilled area and provide a quantitative rather than a qualitative measure of decomposition. "Once you've trained an organoleptic analyst, the technique is a fast, efficient way to detect decomposed fish," he says. "But a chemical indicator will make people think the measure is more objective."

A Safe Seafood Supply

A walk through just about any seafood market or through any grocery store's seafood section will show the diversity of today's U.S. seafood supply. There are crabs and clams, bass, red snapper, catfish, octopus and squid, mackerel and salmon, and many more--from throughout the country and the world. The selection is a seafood gourmet's delight.


But delight can quickly turn to disaster if the seafood is unsafe. The establishment of HACCP in the seafood industry, along with ongoing research and other federal and state activities, and careful handling by consumers, can help ensure that seafood is not only tasty and healthful but safe to eat, as well.


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How to Spot a Safe Seafood Seller


Anyone who's ever smelled rotting seafood at the fish counter has a pretty good idea of what a poorly run seafood market smells like. But the absence of any strong odor doesn't necessarily mean that the seller is practicing safe food handling techniques.


Based on FDA's Food Code, here are some other points to consider:


 Employees should be in clean clothing but no outerwear and wearing hair coverings.

 They shouldn't be smoking, eating, or playing with their hair. They shouldn't be sick or have any open wounds.


 Employees should be wearing disposable gloves when handling food and change gloves after doing nonfood tasks and after handling any raw seafood.


 Fish should be displayed on a thick bed of fresh, not melting ice, preferably in a case or under some type of cover. Fish should be arranged with the bellies down so that the melting ice drains away from the fish, thus reducing the chances of spoilage.


 What's your general impression of the facility? Does it look clean? Smell clean? Is it free of flies and bugs? A well-maintained facility can indicate that the vendor is following good sanitation practices.

 Is the seafood employee knowledgeable about different types of seafood? Can he or she tell you how old the products are and explain why their seafood is fresh? If they can't, you should take your business elsewhere.


Figuring Out What's Fresh

 The fish's eyes should be clear and bulge a little. Only a few fish, such as walleye, have naturally cloudy eyes.

 Whole fish and fillets should have firm and shiny flesh. Dull flesh may mean the fish is old. Fresh whole fish also should have bright red gills free from slime.

 If the flesh doesn't spring back when pressed, the fish isn't fresh.

 There should be no darkening around the edges of the fish or brown or yellowish discoloration.

 The fish should smell fresh and mild, not fishy or ammonia-like.

Consumer Steps to Safer Seafood

Here's what you can do when it's your turn to take charge of food safety:

When Choosing Seafood:

- Buy only from reputable sources. Be wary, for example, of vendors selling fish out of the back of their pick-up trucks.
- Buy only fresh seafood that is refrigerated or properly iced.
- Don't buy cooked seafood, such as shrimp, crabs or smoked fish if displayed in the same case as raw fish. Cross-contamination can occur.
- Don't buy frozen seafood if the packages are open, torn or crushed on the edges. Avoid packages that are above the frost line in the store's freezer. If the package cover is transparent, look for signs of frost or ice crystals. This could mean that the fish has either been stored for a long time or thawed and refrozen.
- Put seafood on ice, in the refrigerator or in the freezer, immediately after buying it.
- Recreational fishers who plan to eat their catch should follow state and local government advisories about fishing areas and eating fish from certain areas.

Storing:

- If seafood will be used within two days after purchase, store it in the coldest part of the refrigerator, usually under the freezer compartment or in a special "meat keeper." Avoid packing it in tightly with other items; allow air to circulate freely around the package. Otherwise, wrap the food tightly in moisture-proof freezer paper or foil to protect it from air leaks and store in the freezer.
- Discard shellfish, such as lobsters, crabs, oysters, clams, and mussels, if they die during storage or if their shells crack or break. Live shellfish close up when the shell is tapped.

Preparing:

- Wash hands thoroughly with hot soapy water before and after handling any raw food.
- Thaw frozen seafood in the refrigerator. Gradual defrosting overnight is best because it helps maintain quality. If you must thaw seafood quickly, seal it in a plastic bag and immerse in cold water for about an hour, or microwave on the "defrost" setting if the food is to be cooked immediately. Stop the defrost cycle while the fish is still icy but pliable.
- Marinate seafood in the refrigerator, not on the counter. Discard the marinade after use because it contains raw juices, which may harbor bacteria. If you want to use the marinade as a dip or sauce, reserve a portion before adding raw food.
- Do not allow cooked seafood to come in contact with raw products. Use separate cutting boards and utensils or wash items completely between use.

Cooking:

- It's always best to cook seafood. It's a must for at-risk people. (See ["Who's at Risk?"](#)) The Food

and Drug Administration's 1997 Food Code recommends cooking most seafood to an internal temperature of 145 F (63 C) for 15 seconds.

- If you don't have a thermometer, there are other ways to determine whether seafood is done:
 - For fish, slip the point of a sharp knife into the flesh and pull aside. The edges should be opaque and the center slightly translucent with flakes beginning to separate. Let the fish stand three to four minutes to finish cooking.
 - For shrimp, lobster and scallops, check color. Shrimp and lobster turn red and the flesh becomes pearly opaque. Scallops turn milky white or opaque and firm.
 - For clams, mussels and oysters, watch for the point at which their shells open. That means they're done. Throw out those that stay closed.
- When using the microwave, rotate the dish several times to ensure even cooking. Follow recommended standing times. After the standing time is completed, check the seafood in several spots with a meat thermometer to be sure the product has reached the proper temperature.

Serving:

- Keep hot foods hot (140 F [60 C]) or higher and cold foods cold (41 F [5 C]) or lower.
- Do not keep cooked seafood unrefrigerated or unfrozen for more than two hours.

--P.K.

Who's at Risk?

People with certain diseases and conditions need to be especially careful to follow safe seafood practices. Their diseases or the medicines they take may put them at risk for serious illness or death from contaminated seafood.

These conditions include:

- liver disease, either from excessive alcohol use, viral hepatitis, or other causes
- hemochromatosis, an iron disorder
- diabetes
- stomach problems, including previous stomach surgery and low stomach acid (for example, from antacid use)
- cancer
- immune disorders, including HIV infection
- long-term steroid use, as for asthma and arthritis.

Older adults also may be at increased risk because they more often have these conditions. People with

these diseases or conditions should never eat raw seafood--only seafood that has been thoroughly cooked.

--P.K.

More Information

- Visit <http://vm.cfsan.fda.gov/seafood1.html> on FDA's Website.
- Call FDA's Food Information & Seafood Hotline: [REDACTED]. In the Washington, D.C., area, call [REDACTED].* The hot line offers recorded information in English and Spanish 24 hours a day, every day. Public affairs specialists are available to answer questions from noon to 4 p.m., Eastern time, Monday through Friday.
- Write to FDA's Center for Food Safety and Applied Nutrition, Consumer Education Staff, HFS-555, 200 C St., S.W., Washington, DC 20204.

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More information on [HACCP](#) and the [FDA Food Code](#).

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