food&water watch

Fact Sheet

Do You Know What's in Your Seafood?

How to Choose Safer Fish and Avoid Contaminants

Consumers today try to shop smarter and eat healthier. People are turning to lean and low-calorie foods to maintain a well-balanced diet, and fish are among the most popular choices to make nutritionists' lists for meeting such requirements. Seafood is often praised as a good protein source with low saturated fats and a high concentration of omega-3 fatty acids, which are known to have a variety of excellent health benefits. However, not all seafood is created equal. Depending on where it is caught or raised, or how it is processed, some seafood can be contaminated with chemicals and other toxins that can be extremely harmful to consumers' and their children's health.

Fortunately, there are safer and more sustainable alternatives available. Food & Water Watch created a Seafood Substitutes Card that helps guide consumers to clean, green and safe seafood. It lists alternatives for popular, but potentially harmful, seafood choices. For example, instead of eating tuna that can contain toxins such as mercury, the card recommends mahi-mahi.

The following are descriptions of heavy metals, industrial compounds and chemical residues that Food & Water Watch's Seafood Substitutes Card helps consumers avoid.

Mercury

Mercury is a naturally occurring, but highly poisonous heavy metal. It can be found in lakes, rivers and oceans in unnatural quantities when rain runs from industrial sites down to a water source, carrying pollutants and metals from the factories with it. Many types of fish and shellfish get continued doses of mercury by eating smaller fish or plants that absorb it from the water. That's why species that live the longer and grow bigger usually accumulate more mercury over their lifespans than species with shorter lives. Fish that tend to have high levels of mercury include tuna, marlin, swordfish, wahoo, king mackerel, shark and tilefish.

As the saying goes, you are what you eat; the mercury present in the fish comes right to your table as well. Mercury exposure is risky for everyone, but it is particularly dangerous to fetuses, infants and young children whose brains and nervous systems are still developing.

Because mercury accumulates in the body and can remain there for years, women who plan to become pregnant should avoid seafood with a high risk of mercury contamination so that they don't pass it on to their children.[1] Mercury exposure can cause brain damage and learning disabilities in children. In adults, consum-

ing too much mercury also has serious consequences — it can cause numbness, loss of memory and coordination, tremors, change in hearing and blurred vision, among other physical symptoms. Extremely high levels of mercury exposure can permanently damage an adult's brain and kidneys, or even lead to circulatory failure.[2] Mercury accumulates in both wild and farmed fish, but does not reach dangerous levels in all species. Knowing which fish generally contain the least mercury can help you avoid it.

PCBs

PCBs (polychlorinated bipheynals) are highly toxic industrial compounds that, like mercury, build up in fish and can cause serious health risks for consumers. Although industrial use of PCBs has been banned in the United States, they can still be found in our environment. Like styrofoam, PCBs take a long time to break down and therefore are consumed by wildlife — including fish. PCBs are not highly toxic to consumers who have only had a single contaminated meal, but continual exposure to low levels can be dangerous.

Some of the effects to human health that the U.S. Environmental Protection Agency (EPA) has reported include disruptions in reproductive functions and neurobehavioral and developmental deficits in newborns and children who have been exposed to PCBs in the womb. High levels of PCBs exposure can lead to liver disease, diabetes and thyroid and immune system disruption.[3] The EPA has said that PCBs are a "probable human carcinogen"[4] — meaning that they may cause cancer — and the Food and Drug Administration (FDA) attests that their presence in food "is of the gravest concern."[5] Studies have indicated that farmed salmon possess higher levels of PCBs than wild salmon, because farmed salmon are raised on a commercial feed that has a high level of PCBs.[6] Wild salmon can get less PCBs in their meals, and therefore are safer for humans to eat.

Choosing local, wild-caught seafood is generally safer, fresher and better for the economy in your community, too.

Choosing wild over farmed salmon can make a difference in exposure to PCBs and dioxins.

Dioxins

Dioxins are a group of chemical compounds from three closely related chemical families, including certain PCBs. They are a type of pollution from some industrial processes, waste incineration, and even burning household wood. Like PCBs, dioxins are hard to get rid of and they remain in the environment long after they are created. Fish and other aquatic organisms consume the dioxins that make their way into their habitats. For humans who regularly ingest low levels of dioxins — by eating certain types of seafood that have been exposed for example — there is evidence that it can result in developmental or reproductive effects, particularly in fetuses, babies and children. Dioxins are also considered a potential carcinogen.[7] Farmed salmon have been found to consume more dioxins than wild salmon, and research has shown that there are higher health risks associated with eating dioxin-contaminated farmed salmon than there are with wild salmon who have been exposed to dioxin.[8]

Antibiotic Residues

Imported farmed fish and shellfish are often grown in overcrowded and dirty tanks or cages, alongside dead and decaying fish and fish waste. They are often treated with antibiotics so that they can withstand the harsh environment. Residues of these antibiotics travel with seafood from their tank to your table. Chloramphenicol, penicillin and other drugs used in production can pose serious health risks to consumers who may become susceptible to antibiotic-resistant bacteria. For the many people with allergies to antibiotics, contaminated seafood can cause unexpected allergic reactions. In 2007, increased monitoring of imported seafood from China led the FDA to issue an import alert concerning farmed shrimp and several other types of seafood. Between October 2006 and May 2007, the agency tested 89 samples of seafood imported from China and found that 25 percent contained drug residues. These residues included nitrofurans in shrimp; malachite green (a pesticide) in dace, eel and catfish; gentian violet (an

antifungal) in eel and catfish; and flouroquinolones (an antibiotic) in catfish. The FDA stated that clear scientific evidence indicates that the use of these drugs and chemicals in raising seafood can lead to an increased antimicrobial resistance in human pathogens (stronger germs that are resistant to our medicines) and that prolonged exposure to some of these chemicals has been shown to cause cancer.[9]

Pesticide Residues

Like non-organic farmers on land, seafood farmers often use pesticides to kill unwanted pests — including fish, mollusks, fungi, plants, insects and parasites — that interfere with their production. Shrimp producers especially tend to use large quantities of chemicals to clear out their ponds. Sometimes these chemicals remain in the shrimp, and can cause health problems for consumers who eat them. The cumulative effects of pesticide consumption, including cancer and neurological damage, develop slowly.[10] Pesticides build up in a person's system over a lifetime and may result in damage long after the first exposure. The best way to avoid consuming seafood with either antibiotic or pesticide residues is to choose U.S. wild-caught seafood or sustainably farmed U.S. seafood from land-based, recirculating operations, which try to avoid the use of drugs and chemicals.

Bacterial Residues

Despite the many antibiotics used in seafood production, some imported seafood comes to us contaminated with bacteria. The heavy use of drugs has actually made seafood more likely to be contaminated with bacteria that are now resistant to antibiotics. Because the bacteria that survive are resistant to antibiotics, it can be difficult to treat people who become sick from eating contaminated food. *Salmonella* bacteria have been found in imported seafood — especially shrimp. Even though shrimp accounted for only 22 to 24 percent of seafood imports between 2003 and 2006, it amounted to almost 40 percent of the imports refused because of *Salmonella* contamination.[11] One third of human cases of *Salmonella* infection worldwide are resistant to five or more antibiotics.[12] In 2000 and 2004, scientists suggested that antibiotic-resistant *Salmonella* from fish or shrimp facilities in Asia likely caused several outbreaks of *Salmonella* infections in Europe and the United States.[13]

Conclusion

This array of dangerous contaminants may appear to make eating seafood a risky business, but there is plenty of seafood that is safe to eat and contributes to good health. Choosing U.S. seafood over imports greatly reduces the risk of consuming antibiotic or bacterial residues. Food & Water Watch's Seafood Substitutes Card lists fish choices that meet our criteria for seafood that is clean, green and safer to eat.

Endnotes

[1] "What You Need to Know about Mercury in Fish and Shellfish." The Environmental Protection Agency, 2004. Available at: www.epa.gov/waterscience/fish/advice

[2] "Health Effects." Mercury, The Environmental Protection Agency. Available at: www.epa.gov/mercury/effects.htm

[3] "Public Health Implications of Exposure to Polychlorinated Biphenyls (PCBs)." U.S. Public Health Service, The Agency for Toxic Substances and Disease Registry, U.S. Department of Health and Human Services and The U.S. Environmental Protection Agency. Available at: www.epa.gov/waterscience/fish/pcb99.html#abstract

[4] "Health Effects of PCBS." Polychlorinated Biphenyls (PCBs),The Environmental Protection Agency. Available at: www.epa.gov/epaoswer/hazwaste/pcbs/pubs/effects.htm

[5] "Dioxin and PCB." Center for Veterinary Medicine, U.S. Food and Drug Administration, June 16, 2000. Available at: www.fda.gov/cvm/dioxin.html

[6] Easton, M.D. et al. "Preliminary examination of contaminant loadings in farmed salmon, wild salmon and commercial salmon feed." *Chemosphere*, 46:1053-1074, 2002.

[7] "Questions and Answers About Dioxins." The Interagency Working Group on dioxin, July 2006. Available at: www.cfsan.fda.gov/~lrd/dioxinqa.html#g1

[8] Foran, J.A. et al. "Risk-based consumption advice for farmed Atlantic and wild Pacific salmon contaminated with Dioxins and Dioxin-like compounds." *Environmental Health Perspectives* 113(5):552-556, May 2005.

[9] "Import Alert IA #16-131." Import Program, Office of Regulatory Affairs, US Food and Drug Administration, August 3, 2007, www.fda.gov/ora/import.

[10] "Endosulfan RED Facts." US Environmental Protection Agency, November 2002, www.epa.gov; GESAMP, 1997; Gräslund, 2003; Gräslund, 2001.
"Reminder to Aquaculture Producers About the Use of Formaldehyde." Center for Veterinary Medicine, US Food and Drug Administration, June 23, 2006; GESAMP, 1997.
See: *Suspicious Shrimp* for more information.

[11] Calculations conducted by Food & Water Watch based on information received from the FDA through a Freedom of Information Act request. For more information on the request and how the data was analyzed, please see "Import Alert" released by Food & Water Watch in July 2007, available at: www.foodandwaterwatch.org/fish/copy_of_pubs/reports/import-alert, call 202.683.3500, or email info@fwwatach.org

[12] "Antibiotic Resistance — An Emerging Public Health Crisis." Keep Antibiotics Working: The Campaign to End Antibiotic Overuse, Washington DC, www.keepantibioticsworking.com.

[13] Cabello, Felipe C. "Heavy use of prophylactic antibiotics in aquaculture: a growing problem for human medicine and animal health and for the environment." *Environmental Microbiology*. 8(7): 1137-1144, 2006.

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