Why health professionals should care about sustainable fisheries

PRESCRIPTION: SUSTAINABLE SEAFOOD

Health benefits of seafood consumption

A growing body of scientific literature demonstrates that consuming even modest amounts of fish helps protect against heart disease and stroke, and may have important benefits for pre- and post-natal cognitive development. The federal government[1] and American Heart Association[2] both note that eating two servings of fatty fish per week may reduce the risk of coronary heart disease in healthy people and the risk of mortality from cardiovascular disease in people who have already experienced a cardiac event. At present, Americans fall short of these consumption levels, averaging only five ounces of fish per week.

U.S. fish oil capsule sales have tripled in recent years.

Salmon is popular for its high omega-3 content.

Omega-3 fatty acids

Cardiovascular benefits are greatest from consuming fish high in long-chain omega-3 fatty acids, namely docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA).[3] The highest levels of these omega-3s occur in small oily fish such as mackerel and herring, and larger predatory fish such as salmon and some tuna.

Although fish cannot efficiently synthesize their own DHA/EPA, small fish obtain these fatty acids from consuming marine algae or minute planktonic invertebrates such as krill. Carnivorous fish, in turn, consume these smaller fish and accumulate their DHA/EPA.

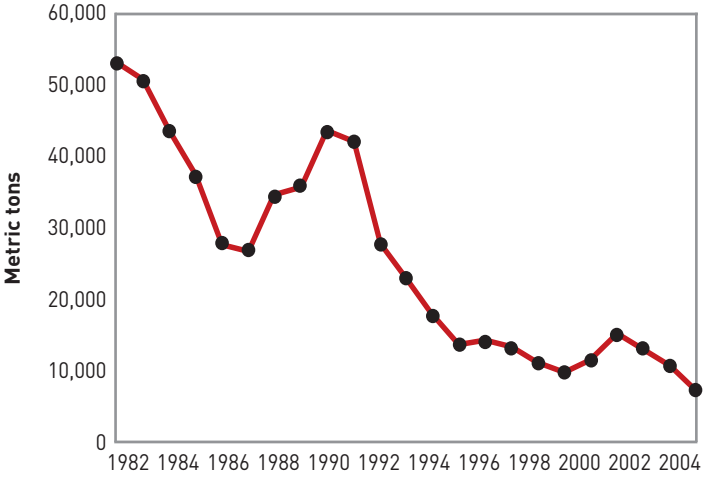
By contrast, terrestrial sources of omega-3s contain primarily the shorter chain alpha-linolenic acid (ALA), which is not as beneficial.

Some food products are enriched with omega-3s—generally plant-derived ALA or fish-derived DHA/EPA.[4] At least one company produces DHA directly from marine algae; their product is used to enrich many infant formulas and a few other products.[5] However, commercial use of algal DHA in foods is not widespread to date.

In short, consuming fish or fish oil (or products enriched with fish oil) is currently the only way to add substantial quantities of key heart-healthy omega-3s to the diets of most Americans.

Wild fisheries

Sadly, even as the health benefits of eating fish are becoming increasingly clear, the ocean's ability to provide plentiful fish is diminishing. Following the advent of industrial fishing in the mid-20th century, the biomass of large predatory fish plummeted—by an astonishing 90 percent according to one analysis.[6] After rising for decades, the quantities of wild fish caught worldwide hit a plateau in the 1990s, despite the fishing industry's efforts



U.S. Atlantic cod landings have declined precipitously. SOURCE: NMFS

to continue to increase the catch.[7] A recent study projects that all wild fisheries will suffer 90 percent depletion by 2048 if current management continues.[8] In U.S. waters, one-third of all fish stocks are overfished.[9] Examples include many of America's favorite seafood items—Atlantic cod, sea scallops, flounder, monkfish, grouper, snapper, Alaska king crab and several species of tuna.

As fish stocks become severely depleted, they become commercially unviable. To date, consumption has simply shifted to less exploited stocks. But there are few such stocks remaining, and they too are likely to become over-exploited as fishing pressures on them increase. For example, in 1976, the U.S. claimed part of Georges Banks within its territorial waters and began fishing Atlantic cod at several times historical levels.[10] By the early 1990s, the cod population had crashed.[11] It remains severely depleted, with the 2004 catch the lowest since reliable reporting began in 1950.[12]

As cod crashed, two deepwater southern hemisphere species collectively known as Chilean sea bass were increasingly used as substitutes for cod and similar, depleted fish.[13] Fifteen years of intense fishing pressure on these long-lived, slow-to-reproduce species now threatens their populations. The black market for Chilean sea bass is so lucrative that Australian territorial fishing grounds are patrolled by armed enforcement vessels to protect this fish.[14]

Aquaculture

The booming aquaculture industry—now the source of nearly half of the world's edible fish[15]—can in theory help narrow the gap between declining global fisheries and increasing seafood demand. However, feed for carnivorous fish—those farmed fish highest in omega-3s—contains large quantities of fishmeal and fish oil. These feed ingredients are primarily made from wild fish caught specifically for meal and oil production. The result is that some aquaculture actually *increases* the demand for wild fish, rather than reducing it.[16] Conventional salmon farming, for example, requires approximately three pounds of wild-caught fish to produce a single pound of salmon.

Without new types of feed ingredients, fish farmers' demand for wild fish will grow as aquaculture continues to boom. Farming largely vegetarian fish such as tilapia,

Indiscriminate bottom trawls have high incidental catch (bycatch) and can damage sea floor habitats.

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catfish, and carp uses little fish in feeds, but these fish also have low levels of the most heart-healthy omega-3s (DHA/EPA). Similarly, heavy substitution of plant-based proteins and oils for fishmeal and fish oil can result in fish with lower levels of DHA/EPA. Many fish farms now use some fishmeal made from fish trimmings from seafood processing,[17] but commercial supplies are limited. The development of alternative feed supplements high in DHA/EPA is promising,[18] but this technology is not yet commercially viable.

Supply and demand

Even though Americans eat less seafood than health officials recommend, U.S. seafood consumption is substantial. In 2004, it reached a record 4.85 billion pounds, an increase of nearly 10% since 1999.[19] Much of this growth in consumption has come from imports, now about 80% of seafood consumed in the U.S.[20] Continued media attention about the health benefits of omega-3s is likely to spur further increases in fish consumption, as is the growing number of senior citizens,[21] who tend to consume more seafood per capita than younger people.

Globally, seafood demand could exceed supply by almost 10% a year, or 11 million metric tons, by 2015.[22] The resulting price increases will likely shift some consumption to non-seafood protein sources, which lack DHA/EPA.

What can be done

The good news is that the oceans can provide far more fish than they currently do. Unlike humans, fish do not stop growing at adulthood—their reproductive potential increases exponentially with age. For example, a *single* 10-year old, 24-inch female red snapper produces nine million eggs annually, while it would take *more than 200* four-year old, 16-inch snappers to equal that same feat.[23]

Unfortunately, present fishery policies often allow too many fish to be taken too fast, without leaving enough large, highly reproductive females. Current management schemes usually restrict the amount of time an area can be fished, or allow unrestricted, "open" access. The short-term economic incentives that stem from these systems push fishermen to maximize today's catch at the expense of future stock and ecosystem health.

Well-designed policies can help correct this problem by aligning fishermen's economic interests with conservation, and long-term ecosystem health with financial

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Heavy fishing pressure can deplete entire populations.

returns. For example, allocating fishermen a fixed percentage of the total allowable annual catch set by fishery regulators provides them with an incentive to conserve—if the total allowable annual catch increases, so will the size (and value) of each fisherman's allocation. Such "catch share" programs are already proving their worth in fisheries like Alaska's halibut fishery, where the fishing season has grown from a two-day derby to a protracted 200-day season.[24] Without such policies, more fish stocks will crash, leading to a negative-feedback cycle in which the dwindling number of remaining stocks will be more-intensively fished, leading them to crash as well.

What health professionals can do

Medical professionals interested in encouraging the consumption of heart-healthy seafood have a vested interest in supporting sustainable fisheries policies—policies that will make seafood abundant and affordable not just next year, but for years to come. Numerous opportunities exist. One is to communicate directly to patients, colleagues, seafood retailers and others, the importance of choosing ecologically preferable, low-contaminant seafood. Both the Environmental

Offering pocket guides to patients helps them choose eco-friendly, low-contaminant fish when they shop for seafood.*

Defense and Monterey Bay Aquarium web sites[25] provide useful information, ranging from simple, downloadable, wallet-sized seafood guides* to detailed fisheries information.

Another opportunity is informing policymakers that the long-term viability of fish stocks is important to Americans' health. Physicians may work as individuals or within medical societies to achieve this objective. Conservation organization web sites provide avenues for taking such action to protect ocean resources.[26]

As recently noted in the *American Journal of Preventive Medicine,* "Eating fish may be good for health, but eating too many fish too fast is bad for the biosphere's health, and therefore, in due course, for people."[27] With physicians' help, policies can be adopted that are good for both people and the biosphere—and thus for generations yet to come.

* For individual copies, please mail a self-addressed stamped envelope to: Seafood card, Environmental Defense, 257 Park Avenue South, New York, NY 10010. To receive large numbers of cards for distribution, please send an email to seafood@environmentaldefense.org.

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26 See http://www.oceansalive.org/go/healthpros
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For more information, please contact John Balbus, MD, MPH, Health Program Director, seafood@environmentaldefense.org

Environmental Defense • 257 Park Avenue South, New York, NY 10010 • 212-505-2100 • www.oceansalive.org/go/healthpros

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