The Government's Big Fish Story

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Men's Health

When Randal McCloy was rushed to West Virginia University Ruby Memorial Hospital's intensive-care unit, he was practically dead. The 27-year-old coal miner had spent 41 hours buried 2 ½ miles underground after an explosion in the Sago, West Virginia, mine where he'd been working. His 12 oxygen-starved colleagues had all perished.

"As far as we know, he survived the longest exposure to carbon monoxide poisoning," says Julian Bailes, M.D., the neurosurgeon assigned to the case. McCloy was in a coma and in deep shock, his heart barely beating, one of his lungs collapsed, his liver and both kidneys shut down. Even if he somehow managed to pull through, doctors predicted McCloy would be severely brain damaged, since the carbon monoxide had stripped the protective myelin sheath from most of his brain's neurons. "It's very difficult to come back from a brain injury," says Dr. Bailes. "There's no drug that can help that."

While McCloy was being given oxygen infusions in a hyperbaric chamber, Dr. Bailes was struck by inspiration: He ordered a daily dose of 15,000 milligrams (mg) docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA) for the miner. In layman's terms?

"Fish oil," says Dr. Bailes.

Several weeks passed. Then, unexpectedly, McCloy emerged from his coma. This in itself was amazing, but he wasn't done. In the weeks that followed, he stunned even the most optimistic experts by recovering his memory and gradually regaining his ability to walk, talk, and see, a turnaround that many in the medical field called miraculous.

Although Dr. Bailes believes the hyperbaric chamber may have worked some magic on the myelin, he thinks much of the credit belongs elsewhere. "The omega-3s helped rebuild the damaged gray and white matter of his brain," says Dr. Bailes, who now takes his own medicine, swallowing a fish-oil supplement each morning. On his orders, McCloy, still recuperating at home, continues to take fish oil daily. "I would say he should be on it for a lifetime," says Dr. Bailes. "But then, I think everybody should."

Maybe what fish oil needed all along was a better publicist. After all, this isn't the medical community's first infatuation with omega-3s. Back in 1970, a pair of Danish researchers, Hans Olaf Bang and Jørn Dyerberg, traveled to Greenland to uncover why the Eskimo population there had a low incidence of heart disease despite subsisting on a high-fat diet. Their finding: The Eskimos' blood contained high levels of omega-3s, establishing the first link to heart health. But even though this discovery spurred additional omega-3 research throughout the '70s and '80s, the public remained more interested in other nutrients—none of which had the unfortunate words "fish" or "fatty" in their names.

There are three types of omega-3s: DHA and EPA, found in fish and marine algae (which is where the fish get them), and alpha-linolenic acid (ALA), which is found in plants, seeds, and nuts. All three have health benefits, but those attributed to DHA and EPA have sparked renewed interest in recent years. Studies show that this tag team may not only reduce a person's risk of heart disease and stroke but also possibly help prevent ailments as diverse as arthritis, Alzheimer's disease, asthma, autoimmune disorders, and attention-deficit/hyperactivity disorder—and those are just the A's. Researchers are now exploring if these multifunctional fats can, among other things, ward off cancer and even make prison inmates less violent. It's enough to make omega-3 geeks downright giddy.

"Omega-3s are fantastic!" says Jing X. Kang, M.D., Ph.D., a Harvard University researcher who made the news by genetically engineering pigs to produce omega-3s in their meat. "Not just for your heart but also for brain function, immunity function, women's health, children's health—I'm amazed at how important they are."

In fact, some experts argue that omega-3s should be labeled essential nutrients as necessary to health as, say, vitamins A and D. "They're involved in the metabolism of each individual cell," says Artemis P. Simopoulos, M.D., a physician and the president of the Center for Genetics, Nutrition and Health in Washington, D.C. "They're part of your body's basic nutrition."

But while some see omega-3s as a nutritional no-brainer, others find them surprisingly controversial. "Omega-3s are way, way overhyped," says Marion Nestle, Ph.D., M.P.H., a professor of nutrition and public health at New York University and the author of What to Eat. "The research so far has been mixed. I'll grant that they're healthy, but I don't think if you don't eat them you're going to die of a heart attack."

The government has been equally cautious. So far, the Food and Drug Administration has issued only a tepid statement that "supportive but not conclusive research" indicates that DHA and EPA are good for your heart. And the Food and Nutrition Board—the scientific panel that, funded mostly by federal money, creates Daily Recommended Intakes (DRI) for essential nutrients—has shrugged off the issue altogether. It crowned ALA essential, but ignored DHA and EPA. "We didn't feel the data were sufficient," says Linda Meyers, Ph.D., director of the board. It's precisely the sort of comment that leaves omega-3 researchers flabbergasted.

"They're in the Dark Ages," says Bill Lands, Ph.D., a retired National Institutes of Health (NIH) biochemist who has

written extensively about omega-3s and is widely considered the field's elder statesman. "The science was very clear 15 years ago. But they're not interested in science. All they're interested in doing is preserving the status quo, when they could be saving lives."

I stare down at the fish lying on the laboratory countertop. It stares back with one dead eye. Hours ago it was swimming in the Chesapeake Bay with 2 million of its brethren; tomorrow they'll all be squashed in a giant screw press to make 10,000 gallons of oil destined for fish-oil capsules and omega-3 fortified foods.

"Not very glamorous, is he?" says Jane Crowther, senior director of Omega Protein's Health and Science Center. It's hard to disagree: I've come to the nation's largest fish-oil refinery, in Reedville, Virginia, and now that I'm face to fin with what a poster on the wall calls "MENHADEN...THE WONDERFISH!" I'm not exactly awestruck. Bony, oily, and without much meat, the menhaden isn't even considered edible by most people. And yet, hidden inside is a substance that some anthropologists claim was critical to our very evolution; without it, they say, we'd still have brains like chimps'.

Ask most scientists and they'll tell you that Stone Age man evolved on the African savannas, developing his big, complex brain as a result of all the animals he'd hunt and eat. But most scientists would be wrong, according to Michael Crawford, Ph.D., who, along with researchers from the USDA, conducted a 2002 study challenging the prevailing theory, which he calls "a load of rubbish."

Crawford, the director of London's Institute of Brain Chemistry and Human Nutrition, argues that many other savanna mammals also subsisted on meat, but none developed our megabrains. "And with their strong jaws and sharp teeth, they were far better equipped to eat flesh than we were," he says. Yet relative to their growing bodies, those animals' brains actually shrank, while man's brain expanded from a 1-pound processor to a 3-pound supercomputer.

What were we dining on that the rest of the Paleolithic crowd wasn't? Crawford has a three-letter answer: DHA. "The human brain is soaking in DHA," he says. "It is the only substance that supports that level of neural development and cognitive function."

And lo and behold, paleontologists have found evidence that early man lived along the coasts of southern Africa, leaving behind mounds of fossilized shells and other table scraps. Crawford points out that catching fish would have been a heck of a lot easier than snaring four-legged prey. Children and pregnant women could wade in and collect mollusks themselves, feeding young brains in the process. Studies show that DHA helps secure the connections between brain cells, especially in utero, when pregnant women can increase their babies' IQs by as many as six points.

While the savanna-versus-seashore debate will continue (Emory University researchers recently fired their own scientific salvo at Crawford's theory), no one can dispute that we're veritable meat-eating machines today. The average American ate only 16.2 pounds of fish in 2005, but consumed 195 pounds of meat. And although our livers can manufacture tiny amounts of DHA and EPA when we eat lots of ALA-rich nuts and seeds, these aren't exactly our favorite foods, either.

Changing agricultural techniques have worsened the situation. The natural omega-3 contents of meat, milk, and eggs have plummeted now that our livestock no longer graze on ALA-rich grass, instead consuming corn, wheat, and other grains that are loaded with another group of fatty acids, called omega-6s. In fact, the disappearance of omega-3s from our diets has coincided with an upsurge in omega-6s, mainly in the form of cereals, grains, and processed foods made with hydrogenated oils. Dr. Simopoulos estimates that in caveman days, we ate an equal amount of the two types, but that the average American now eats 16 times more omega-6s than omega-3s.

"That's what's really killing us," says Lands. "The balance of 6 and 3 got out of whack." These two types of fatty acids have a biochemical yin-and-yang relationship: While omega-3s reduce our body's inflammation response, omega-6s encourage it. Each fatty acid is crucial: For example, if your inflammatory response is too weak, you won't be able to fight infection properly. And in theory, the push and pull should create perfect balance. Instead, the excess of omega-6s in our diets may have left us in a perpetual state of inflammation.

"The reason you take ibuprofen and Celebrex and all those nonsteroidals is to prevent the manufacture of these inflammation molecules in the first place," says Joseph Hibbeln, M.D., a neuroscientist with the NIH. "The mental picture I have is of the Dutch boy with his finger in the dike, where the finger is expensive pharmacology, and the flood is omega-6s."

Andrew McGeehin had limped for the past half century. "Stupid football," mutters the 83-year-old resident of Allentown, Pennsylvania. He tore up his right knee in his 30s, and despite surgery and drugs, the pain gradually became enough to wake him at night. Finally, McGeehin's orthopedist, Thomas Meade, M.D., suggested that he take an omega-3 supplement.

"I wasn't expecting much. But I figured I'd tried everything else," says McGeehin, who began swallowing fish oil along with his usual dose of the anti-inflammatory drug Voltaren. One week later, McGeehin was startled to realize that the stiffness in his knee was gone. He was able to walk with the easy, fluid stride of a younger man.

"Dr. Meade must be a genius!" McGeehin says today, though Dr. Meade himself explains it more modestly: "I read the

literature. There's a plethora of evidence supporting the benefit of omega-3s for joint pain." He cites a 2006 University of Pittsburgh study of 125 people with neck and back pain, in which 60 percent of participants reported having less pain after taking omega-3s. And clinical studies on rheumatoid arthritis suggest that patients who take a daily dose may be able to cut back on their meds.

Indeed, in the 2 years in which Dr. Meade has been recommending omega-3s to his patients, he's seen a major shift in his orthopedic practice. "I almost never prescribe anti-inflammatories now," he says. "My staff kids me that I'll put us out of business with fish oil."

Omega-3s act as a sort of internal ice pack, in part because they spur our bodies to produce several inflammation-lowering substances. "Omega-3s work along the same biochemical pathway as a COX-2 inhibitor, such as Vioxx, but farther upstream," says Dr. Meade, meaning that omega-3s treat the underlying problem rather than the symptoms. And emerging research indicates that this powerful ability to ease inflammation is one of the ways omega-3s may help prevent a number of ailments, including...

Heart attack and stroke.

Cardiologists now believe that chronic inflammation triggers the release of artery-blocking plaque. In the most definitive study to date, published in the Lancet, heart-attack survivors who took 900 mg fish oil daily were 30 percent less likely to die of a second heart attack, and 20 percent less likely to suffer a stroke, than those who skipped the supplement.

Omega-3s can guard your arteries in other ways, too, since they also lower triglycerides and make blood vessels more elastic. Add in their ability to improve electrical communication between cardiac cells, thereby preventing arrhythmia, and you can see why omega-3s are a standard part of cardiac care in Europe. If you have a heart attack in Italy, France, Britain, or Spain, the hospital will even send you home with a prescription for Omacor, a "medication" that's superpurified DHA and EPA.

Alzheimer's disease.

Though not yet conclusive, research suggests that runaway brain inflammation may cause Alzheimer's disease. In a 2007 study published in the American Journal of Clinical Nutrition, elderly men who consumed 350 mg DHA and EPA daily experienced less cognitive decline than those who swallowed only 15 mg a day. And researchers at the Rush Institute for Healthy Aging, in Chicago, found that people who ate fish at least once a week were significantly less likely to develop Alzheimer's disease than those who ate more turf than surf.

Prostate cancer.

It's estimated that chronic inflammation is the culprit in 20 percent of all cancers, and that may include many cases of prostate cancer. In a 2003 Harvard study that tracked nearly 48,000 men over 12 years, researchers discovered that the men who ate fish three times a week were 25 percent less likely to develop metastatic prostate cancer than those who dined on less. However, a recent (and hotly debated) study review in the Journal of the American Medical Association says clear proof of cancer protection is still lacking.

Depression.

Could fish be the ultimate mood food? Ohio State University researchers recently analyzed blood samples from 43 older adults and found that a high omega-6 to low omega-3 ratio corresponded to elevated inflammation and more symptoms of depression. This and previous research suggest that eating more fatty fish or supplementing with omega-3s could help us beat the blues.

In the world of nutrition, few events make a scientist's palms sweat as much as the release of a newly revised DRI list.

Before the Food and Nutrition Board announced its most recent DRI for fatty acids, in 2002, some experts were optimistic that omega-3s would make the cut, given the research strides made over the previous decade. Instead, DHA and EPA were nowhere to be found—snubbed yet again by the larger scientific community. Even worse, the new DRI recommended that adults continue eating 10 times as many omega-6s as omega-3s, a ratio that practically gave omega-3 researchers a heart attack.

But Alice Lichtenstein, D.Sc., a Tufts University public-health professor who was on the panel that voted DHA down, doesn't see what all the fuss is about. "There just wasn't enough data to go on," she says. "What's out there is a little difficult to interpret."

Part of the problem she's referring to is that some studies didn't account for the amount of omega-6s that research participants consumed (too much blunts the effects of omega-3s), and other supplement studies didn't adjust for how much fish their participants ate. The differences make the studies hard to compare.

"It's all over the place," says Sharon Akabas, Ph.D., codirector of the master's program at Columbia University's institute

of human nutrition, which held a symposium on this very problem. "It's like dealing with a moving target." Also, since most omega-3 research has focused on curing the sick, no one has yet pinned down how much DHA and EPA keeps healthy people well. Without that magic number, the Food and Nutrition Board says, its hands are tied.

The board's cautious approach is typical of how slow our government is to accept scientific change, say advocates of omega-3s. For example, although the World Health Organization endorsed adding DHA to infant formula back in 1994, it took the FDA until 2002 to approve the move. "Fifty-nine countries added DHA to infant formula before we did," says Dr. Simopoulos. "Mexico and China were ahead of us! And that's because our government is 20 years behind when it comes to the science."

Nevertheless, Meyers insists that the Food and Nutrition Board is just being thorough. "Anything in nutrition is going to lead to controversy," she says. "No matter the issue, some people will say we don't go far enough and others will say we go too far."

Perhaps, but it's revealing that even though important studies have come out since the board's 2002 list, it has no plans to revisit the status of DHA, despite the fact that at least one panelist has changed her mind. "There's a growing consensus that we should be eating more DHA for sure, as well as EPA," says Penny Kris-Etherton, Ph.D., a Penn State University professor of nutrition. "I would like to see stronger dietary recommendations than we currently have."

Columbia's Akabas agrees, which is why her Institute of Nutrition has come out with a bold endorsement. "We think the whole U.S. population would benefit from an upward shift in omega-3 intake, and we don't see any downside," she says. "So our recommendation is to not wait until the research becomes definitive. It's time to examine the development of a DRI."

One group that isn't waiting around for the blessing of the Food and Nutrition Board is the food manufacturers. Companies are already adding fish oil—minus the fish odor—to everyday products such as yogurt, frozen pizza, and orange juice. Most recently, Hormel Foods announced that it was entering this arena by partnering with a North Carolina research firm. What this also means, however, is that our government's greatest nutrition minds are being scooped by the maker of Spam.

Pick the Perfect Fish-Oil Supplement

Purity

When Consumerlab.com tested 41 fish-oil supplements, none was found to contain unsafe levels of mercury, PCBs, or dioxins. One explanation is that many brands are now molecularly distilled to remove any possible contaminants.

Dosage

Ignore the total milligrams (mg) of fish oil, and focus instead on the combined eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). You want a supplement that contains at least 500 mg per dose or serving. If you're on blood thinners, talk to your doctor about the best dosage.

Form

Your choice is basically capsules or a liquid. They're equally effective at delivering omega-3s to your bloodstream, so go with the form you think you'll take on a daily basis.

Fish Burp

Some people experience this as their stomachs dissolve the fish-oil capsule. Beat the burp by buying enteric-coated capsules or freezing regular capsules. Either strategy will cause the fish oil to be released in your intestine instead, says William Harris, Ph.D., a professor of medicine and biomedical sciences at the University of South Dakota.

Ratio

The ratio of EPA to DHA used in research varies, but most supplements are made with a 3:2 split. This translates to 300 mg EPA and 200 mg DHA in a 500 mg supplement.

Source

Any fish oil will do, be it from mackerel or menhaden, salmon or sardines. Supplements made from algae oil contain only DHA, and those made from flaxseed oil have alpha-linolenic acid (ALA), only a little of which can be converted into EPA and DHA by your body.

Antioxidants

Once inside your body, omega-3s can quickly lose their power due to oxidation. Look for vitamin E, a.k.a. tocopherol, an antioxidant that can neutralize free radicals.

More on Omega-3 Fatty Acids on MSN Health & Fitness:

- Reality Check: Omega-3 Fatty Acids
- The Cholesterol Connection
- Check Your Oil
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