

## **Tilapia: Tasty, Cheap--and Dangerous**

**Lyle Loughry--July 2008**

Farm-raised tilapia has become one of the most highly consumed fish in America. In the United States, alone, tilapia has shown the biggest gains in popularity among seafood, and this trend is expected to continue as consumption is projected to increase from 1.5 million tons in 2003 to 2.5 million tons by 2010. It provides both taste and modest cost, but, according to new research from **Wake Forest University School of Medicine**, it appears that it could be a potentially dangerous foodsource for some patients with heart disease, arthritis, asthma and other allergic and auto-immune diseases that are particularly vulnerable to an “exaggerated inflammatory response.” Inflammation is known to cause damage to blood vessels, the heart, lung and jointtissues, skin, and the digestive tract.

The reason for the concern --Tilapia has very low levels of beneficial omega-3 fatty acids and, perhaps worse, very high levels of omega-6 fatty acids. The researchers say that this combination presents obvious health concerns. The article was published recently in the **Journal of the American Dietetic Association**.

Their research revealed that farm-raised tilapia, as well as farmed catfish, “have several fatty acid characteristics that would generally be considered by the scientific community as detrimental.” Tilapia has higher levels of potentially detrimental long-chain omega-6 fatty acids than 80-percent-lean hamburger, doughnuts and even pork bacon, the article says. “For individuals who are eating fish as a method to control inflammatory diseases such as heart disease, it is clear from these numbers that tilapia is not a good choice,” the article says.

“All other nutritional content aside, the inflammatory potential of hamburger and pork bacon is actually lower than the average serving of farmed tilapia.” The article notes that the health benefits of omega-3 fatty acids, known scientifically as “long-chain n-3 polyunsaturated fatty acids” (PUFAs), have been well documented. The American Heart Association now recommends that everyone eat at least two servings of fish per week, and that heart patients consume at least 1 gram a day of the two most critical omega-3 fatty acids, known as EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid). But, the article says, the recommendation by the medical community for people to eat more fish has resulted in consumption of increasing quantities of fish such as tilapia that may do more harm than good, because they contain high levels of omega-6 fatty acids, also called n-6 PUFAs, such as arachidonic acid.

“The ratio of arachidonic acid (AA) to very long-chain n-3 PUFAs (EPA and DHA) in diets of human beings appears to be an important factor that dictates the anti-inflammatory effects of fish oils,” the researchers write. They cite numerous studies, including a recent one that predicts “that changes in arachidonic acid to EPA or DHA ratios shift the balance from pro-inflammatory agents to protective chemical mediators ... which are proposed to play a pivotal role in resolving inflammatory response” in the body.

The researchers found that farmed tilapia contained only modest amounts of omega-3 fatty acids -less than half a gram per 100 grams of fish, similar to flounder and swordfish. Farmed salmon and trout, by contrast, had nearly 3 and 4 grams, respectively. At the same time, the tilapia had much higher amounts of omega-6 acids than both salmon and trout. Ratios of long-chain omega-6 to long-chain omega-3 in tilapia averaged about 11:1, compared to much less than 1:1 in both salmon and trout.

Floyd H. “Ski” Chilton, Ph.D., professor of physiology and pharmacology and director of the **Wake Forest Center for Botanical Lipids**, is the senior author of the Journal article. “We have known for three decades that arachidonic acid (AA) is the substrate for all pro-inflammatory lipid mediators,” Chilton said in an interview. “The animal studies say unequivocally that if you feed arachidonic acid, the animals show signs of inflammation and get sick.

Chilton said tilapia is easily farmed using inexpensive corn-based feeds, which contain short chain omega-6s that the fish very efficiently convert to AA and place it into their tissues. This ability to feed the fish inexpensive foods, together with their capacity to grow under almost any condition, keeps the market price for the fish so low that it is rapidly becoming a staple in low-income diets.

“Cardiologists are telling their patients to go home and eat fish, but if the patients are poor, they’re choosing to eat tilapia, **and that could translate into a dangerous situation.**”