

## Reconsidering ALA Omega 3s

By Marie Spano, M.S., R.D., Contributing Editor

Thanks to a plethora of media attention, many consumers know that omega-3s are good for them. However, omega-3s encompass several healthful fatty acids, including alpha-linolenic acid (ALA), eicosapentaenic acid (EPA) and docosahexanoic acid (DHA). And, despite the fact that ALA is the only omega-3 with an established Dietary Reference Intake (DRI) value, the majority of focus has been on the long-chain omega-3 fatty acids EPA and DHA for their myriad health benefits. Consequently, the efficacy of ALA has come into question.

### Omegas dialed down

Omega-3 fatty acids are involved in a wide array of physiological processes in the body. For instance, they serve as a structural component for cell membranes, thereby regulating membrane fluidity and integrity of receptor sites. They also regulate serotonin and dopamine transmission, influence the production of anti-inflammatory compounds in the body, and play a role in eicosanoid synthesis, gene expression, cell growth and protection from apoptosis. In addition, omega-3s influence cognitive development and vision in infants (*Current Pharmaceutical Design*, 2009; 15(36):4,165-4,172).

Each omega-3 fatty acid has its own unique metabolic fate in the body. ALA is the only omega-3 that is considered essential (meaning the body must obtain it from food and cannot make it), whereas EPA and DHA are made from ALA through a series of enzymatic reactions. Though both EPA and DHA are manufactured from ALA, and therefore not (at the current time) considered essential for consumption, this process is inefficient and affected by other fats in the diet. Omega-6 and omega-3 fatty acids compete for the desaturase and elongase enzymes and, therefore, the total amount of the omega-6 fatty acid linoleic acid (the only other essential fatty acid) affects the extent of ALA conversion to EPA and DHA (*American Journal of Clinical Nutrition*, 2000; 71(1):179S-188S). Studies show that approximately 8% to 21% of ALA is converted into EPA, and 4% to 9% of ALA is converted to DHA. Men are on the lower end of this scale, and women on the higher end (*Current Opinions in Clinical Nutrition and Metabolic Care*, 2004; 7(2):137-144).

Because so little ALA is converted to EPA and DHA, some argue that consumers should opt for EPA and DHA and skip ALA altogether, and that EPA and DHA should have established DRIs. However, others have a different take on the matter.

“For years, ALA was compared to EPA and DHA, but a compilation of ALA research has shown that ALA has its own health benefits, and consumers need to add all omega-3s to their diet,” says Carol Berg Sloan, R.D., nutrition consultant, California Walnut Board and Commission, Folsom, CA.

Several studies show that increased consumption of ALA-rich foods can improve some cardiovascular disease risk factors (*American Journal of Clinical Nutrition*, 2001; 74:612–619; *American Journal of Clinical Nutrition*, 1999; 69:890–897; *British Medical Journal*, 1996; 313:84–90). However, all foods naturally rich in ALA also contain a variety of other bioactive compounds that may act independently or synergistically to improve cardiovascular disease risk factors (*American Journal of Clinical Nutrition*, 2009; 89(5):1,649S-1,656S). Common natural sources of ALA include flaxseed and flaxseed oil, walnuts and walnut oil, soybeans and soybean oil, pumpkin seeds, rapeseed (canola) oil, and olive oil. The Adequate Intake for ALA is 1.6 and 1.1 grams per day for adult men and women, respectively.

Although some evidence points toward ALA for health benefits, an abundance of research shows that EPA and DHA play an important role in health and disease prevention. EPA and DHA consumption decreases high blood triglycerides and coronary heart disease risk (*Clinical Cardiology*, 2009; 32(7):365-372) and improves blood pressure and vascular function (*Clinical and Experimental Pharmacology and Physiology*, 2006; 33(9):842-846). In addition, research shows that EPA and DHA show promise for taming inflammation in those with inflammatory diseases such as rheumatoid arthritis and inflammatory bowel disease (*Molecular Nutrition and Food Research*, 2008; 52(8):885-897) and may help with some symptoms of depression (*Current Pharmaceutical Design*, 2009; 15(36):4,165-4,172). EPA and DHA are primarily found in fatty fish.

### ALA emerging

At this time, the beneficial effects of marine sources of EPA and DHA are well-documented, while evidence on the health benefits of ALA lags behind, perhaps due to confounding variables associated with the metabolism of ALA. Despite this, ALA is an important source of omega-3s in the diet, especially for vegans. The average per capita intake of EPA and DHA in the American diet is just 0.1 to 0.2 grams per day, whereas average per capita intake of ALA is approximately 1.4 grams per day (*Arteriosclerosis, Thrombosis, and Vascular Biology*, 2003; 23(2):e20-e30). Most experts indicate that Western diets are out of balance, with too much omega-6 and too little omega-3.

“Consuming foods rich in ALA can help balance the amount of omega-6s eaten while increasing omega-3s in the diet,” says Bruce A. Watkins, Ph.D., professor and director of biosciences and nutrition, Department of Food Science, Purdue University, West Lafayette, IN.

Future research will hopefully better elucidate the differences between ALA, EPA and DHA, and how ALA exerts its effects—either independently or through its role as a precursor to EPA and DHA. However, consumers who include an array of omega-3 fatty acids in their diet will benefit not only from the healthy fatty acids they are consuming, but also from the wide variety of nutrients found within both plant-based and fish-based sources of omega-3 fatty acids.

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