Nutritional Outlook
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Nutritional OUTLOOK

Omega O'Plenty

A look at today's options in a growing omega-3 market.

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Omega-3 market points are on the up. According to SPINS (Schaumburg, IL) market data, combined U.S. sales of fish, flax, and chia omega-3 products in conventional and natural channels have jumped 9%, from a $489 million market to one worth well over half a billion dollars. So, it's time for an update on what's biting in the omega-3 market—from science to sourcing.

Which Omega Is Better?

In the hustle to capture omega-3's growing consumer market, discrepancies among individual omega-3 fatty acids and their natural sources continue to be publicized.

While the science on eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) is growing, the notion that EPA or DHA supplementation is more important than plant-based alpha-linolenic acid (ALA) is being challenged. A study published last fall in the *American Journal of Clinical Nutrition* concluded that ALA might just convert faster in non-fish eaters than in meat eaters. Does this mean that vegans and vegetarians need not worry about EPA or DHA supplementation?

At the same time, the Global Organization for EPA and DHA Omega-3 (GOED; Salt Lake City) is lobbying the European Commission to consider the notion that its authorized claims for ALA and brain health are only a result of ALA's ability to convert into DHA.

In the marathon race for the highest omega-3 source, growing research is examining which omega-3s might be better than their rivals. A recent study funded by krill oil supplier Aker BioMarine (Oslo, Norway) concluded that a krill oil dose of just 63% the amount of fish oil elicits the same omega-3 levels. The results are attributed to the notion that fish oil's triglyceride delivery format pales in bioefficiency compared to krill's phospholipid format.

On the plant side of omega-3s, suppliers of ingredients like chia *(Salvia hispanica)* and perilla *(Perilla frutescens)* are touting omega-3 levels higher than traditional flax.

Omega-3 over Omega-6

We can go on debating which omega-3s and omega-3 sources are better—and, surely, we will—but the focus that will drive better health right now is increasing Western dietary intake of omega-3,

Chia seed is bowling over the omega-3 market.

regardless of where it comes from.

Part of the importance of omega-3 supplementation stems from the unfortunate fact that Western diets are too high in omega-6, due to the steep rise of processed foods made from sources like soybean oil and corn oil. Before the age of processed foods, scientists estimate that the average Westerner's omega-6 to omega-3 ratio was somewhere around 1; now, that ratio is believed to be at least 15:1.

Leveling the scale of omega-6 and omega-3 is of tantamount importance because omega-6s (when consumed in gross amounts) are repeatedly linked to increased risks of inflammatory diseases, autoimmune diseases, and other health conditions. Omega-3s may suppress inflammatory effects by competing for the same binding sites of omega-6s.[1,2]

Artemis Simopoulos (of the Center for Genetics Nutrition and Health; Washington, DC) and Leslie Cleland (of the Rheumatology Unit at Australia's Royal Adelaide Hospital) point out the concern around this omega balance in their 2003 book, *Omega-6/Omega-3 Essential Fatty Acid Ratio*.

> *It is [essential] to decrease the omega-6 intake while increasing the omega-3 in the prevention and management of chronic diseases. Furthermore, the balance of omega-6 and omega-3 fatty acids is very important for homeostasis and normal development.*

The ratio of omega-6 to omega-3 essential fatty acids is an important determinant of health. In making dietary recommendations, omega-6 and omega-3 PUFA should be distinguished in food labels because they are metabolically and functionally distinct.

In pointing out the benefit of increasing omega-3 intake overall—regardless the omega-3 source—Simopoulos and Cleland bring some calm to the issue. Robert Orr, CEO and chairman of the fish oil supplier Ocean Nutrition Canada (Dartmouth, NS), also chimes in. "The bottom line is that there's nothing wrong with flax or canola oil," he says. "Certainly we should be trying to use as much flax and canola as we can in cooking and baking products because that's reducing a huge load of inflammatory-inducing compounds from omega-6 into our bodies. It's absolutely helpful to introduce omega-3 in whatever form; yet, that doesn't take away from the fact that there is a global deficiency of EPA and DHA in the diet. We should get all of these numbers up as quickly, efficiently, and cheaply as possible."

Fish-based omega-3s are going new places, in new products.

Omega-3 Applications

Thanks to new applications of omega-3s, Western consumers are definitely ingesting essential fatty acids far more often. A great number of omega-3 functional foods have recently been made possible—gummies, sauces, dips, baked goods, and beverages, just to name a few—and the list is expanding.

Fish Oil Innovation

Thanks to Omega Protein (Houston), OmegaPure menhaden fish oil can now be incorporated into just about every delivery system you can think of—beverages, baked foods, dressings, dips, desserts, etc. The company even offers OmegaBits, so-called "flavor bits" which make omega-3 fortification as easy as sprinkling these bits (available in sweet or savory flavor profiles, using vegetable, spice, fruit, or herb concentrates) into a number of baking processes.

In a partnership with flax ingredient supplier Glanbia (Fitchburg, WI), OmegaPure fish oil can even take on a full-spectrum ALA, EPA, and DHA profile—again, for a number of food and beverage applications.

And if you want to sneak in fish oil without affecting flavor and other sensory characteristics, National Starch (Bridgewater, NJ) has developed an encapsulated omega-3 product for OmegaPure.

Probiotics and omega-3s? "Why not?" says Nutrition21 (Purchase, NY), which now makes digestive support and heart-health support possible in its new Probiomega product.

Really stretching from the typical dinner plate, Ocean Nutrition Canada recently announced the presence of its Meg-3 fish oil in a Canadian brand of kettle corn.

Flax Oil Innovation

One of the more notable innovations in flax oil comes out of Cargill (Minneapolis). The company's Clear Valley Omega-3 oil is a neutral-tasting combination of flax and canola oil for healthier indulgence in products like cookies, muffins, nutrition bars, spreads, and sauces. As a drop-in solution, Clear Valley is available in several formats, including all-purpose shortening, doughnut shortening, and icing shortening. An "excellent source of ALA omega-3" nutrient content claim is possible, and with a measly 1.07 g of fat per serving.

Also, believe it or not, high amounts of omega-3 are even doable in pizza, as Glanbia introduced OptiSol 5000, a flax-based ingredient designed to improve moisture retention, and thus shelf life, in pizza dough.

Algae Innovation

There's room for algae growth, too—largely thanks to vegetarian DHA leader Martek Biosciences (Columbia, MD). The company's life'sDHA brand DHA algal oil has secured placement in Omega Orange orange juice from Genesis Today and a new chocolate truffle product from Xan Confections, just to name a few of the more unique product launches.

Omega Orange featuring Martek's life'sDHA

Emerging Omega Players

Regardless of bioavailability, omega-3 offerings are growing in every arena.

Chia is arguably the most trending ingredient in the plant-sourced ALA market. In U.S. conventional and natural supermarkets combined, SPINS reports that chia seeds are doing great—with a 65% sales jump to $4,536,917, in the last 12 months alone. Seeds from the Spanish sage boast a solid nutritional profile (high amounts of calcium, fiber, and potassium), and backers of the ingredient are happy to report that its omega-3 content can rival flax. While flax seed holds a 4:1 ratio of omega-3s to omega-6s, chia seed's 3:1 ratio comes with a higher weighted content of omega-3.

"Chia has a higher level of omega-3 fatty acids than any commonly used natural source, with more than 600 mg omega-3 per 1 g of extract," says Valensa (Eustis,

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Algae omega-3 makes its move into chocolate.

FL) CEO Rudi Moerck. "For the consumer, this translates into a smaller effective dose, fewer unwanted constituents, and fewer calories."

Nutritional value aside, chia players often make it a point to call out chia's storage advantages over flax.

"In food applications, flax seed has to be milled for humans to derive benefit from the omega-3s," says Sandra Gillot, general manager of Functional Products Trading S.A. (Santiago, Chile), the developer of Benexia chia seed, which is also offered by Proprietary Nutritionals Inc. "And this is what makes a huge difference—chia seed does not need to be milled or crushed to let the oil out of it. Stomach acidity will dissolve the thin shell of the seed and let the omega-3 become absorbed."

She continues, "In food applications, you need to compare a whole seed, which preserves perfectly the omega-3s inside its shell for up to five years, with a milled flax seed, which is very unstable because once milled, the omega-3s are exposed to the air, incurring oxidation of its essential fatty acid content. [The whole seed] imparts a slightly nutty flavor and odor, and it blends easily with many foods to increase the overall content of protein, fiber, and omega-3s."

Some companies offer even further nutrient protection for chia. Valensa's Tresalbio brand chia seed can be extracted from the company's proprietary botanica. CO_2 extraction from the company's proprietary botanical O2B Peroxidation Blocker system, plus ingredients like caffeic acid and tocopherols, help the chia resist rancification and increase stability.

As you can tell, Valensa has really taken to the plant-sourced omega-3 market. The company even claims to be the first company to perform supercritical extraction of perilla, a less common ingredient that holds an omega-3 to omega-6 ratio of 6:1.

Though lower in EPA and DHA than anchovies or sardines, several companies are investing in the salmon fish oil market. Denomega Nutritional Oils (Sarpsborg, Norway) recently introduced its Omega-Natural Salmon oil to the market, which the company claims is the first-ever cold-pressed Norwegian salmon oil. The natural, nonconcentrated ingredient is never exposed to air or heat during processing, which ensures