

Omega-3 Fatty Acid Balance

EFA (Essential Fatty Acids) and Omega-3 Fatty Acids have been controversial in much of what we have read. Since flax seed, along with some greens such as borage and purslane, is high in ALA/LNA (alpha-linolenic acid), I've always presumed that we're getting enough Omega-3 from non-fish sources. Others, such as Nordic Naturals, a company selling fish oil, say that it must come from fish oil. So where do the fish get it? Since many plants are high in Omega-3, I'm guessing that we get it the same way cows get calcium. Prove me wrong and I will start to eat fish, but after 30 years without it I do not think that is likely! To see an excellent article by Udo Erasmus, PhD. on this subject, just [Click Here](#).

To be more specific, ALA/LNA is converted to EPA and DHA (eicosapentaenoic acid and docosahexaenoic acid), both of which are diet-essential Omega-3 fatty acids. These enzyme conversions are inhibited by high levels of linoleic acid (Omega-6, but also essential) found in safflower (77%), sunflower (65%), corn (53%), soy (51%), cotton (45%), and peanut (26%) oils, among others. The enzymes are also inhibited if you consume so-called "trans-fats" (hydrogen-saturated, or "partially-hydrogenated" oils) or too much saturated fat (mainly from animal products).

The enzymes can also be greatly inhibited by the consumption of fluoridated water or antibiotics, whether prescribed or consumed inadvertently in non-Organic food (for instance, as traces of glyphosate herbicide such as "Round-Up"). Also, certain co-factors are required, including vitamins B3, B6, C, and the minerals zinc and magnesium. The bottom line: If you're already going vegan, eat well, don't over-do the veggie oil or use fancy "spreads", drink pure water, and don't forget to add enough ALA-containing stuff to your diet!

For those who need even more detail on how to more easily balance your Omega-3 to Omega-6 ratio (which should be in the neighborhood between 1 to 1 and 1 to 10), here are a few of the more common sources in order of Omega 3-to-6 ratios, calculated as if all listed undifferentiated 18:3 fatty acids are actually type "n-3" (Omega-3), the "best-case" scenario:

Flax seed	3.865 to 1	Highest vegetable source I know of, and we can grow it.
Chia seed	3.033 to 1	Also very good but much more expensive.
Sage seed	2.27 to 1	Good ratio but not much oil in them.
Camelina oil (C. sativa)	1.36 to 1	Very high in vit. E, and will not cross with GMO Canola.
Canola oil	1 to 2.08	Is there really ANY that is not GMO contaminated?
Hemp seeds	1 to 2.64	Either illegal or very expensive, but good stuff.
Butter	1 to 3.05	But its 30 to 1 saturated fat to Omega-3 ratio is terrible
Butternuts	1 to 3.86	Grown here for nuts but the trees are often diseased.
English Walnuts	1 to 4.2	
Soy oil, refined	1 to 7.42	Getting harder to find organic soy.
Wheat germ oil	1 to 7.94	
Evening Primrose oil	1 to 9	But its 18:3 fatty acid is mostly GLA, more akin to Omega-6
Lard	1 to 10.2	But its 38.9 to 1 saturated fat to Omega-3 ratio is terrible
Whole Egg (average for pastured chickens)	1 to 11.59	With some breeds and flocks this ratio can be even better.
Olive oil	1 to 12.8	Our salad/cooking staple, often with ground flax seeds.

Avocado oil	1 to 13.09	
Black Walnuts	1 to 16.5	These grow locally and are plentiful but strongly flavored.
Hickory Nuts	1 to 19.7	Ditto for these, but they taste just like pecans.
Pecans	1 to 20.92	
Whole Egg (caged chickens)	1 to 34.78	This is a USDA average for non-organic, store-bought eggs.
Corn oil	1 to 46.09	
Sesame seed	1 to 56.9	Loved for their flavor and high calcium, but not used alone.
Hazelnuts	1 to 91	Not the greatest 3 to 6 ratio, but we can easily grow them.
Poppy Seeds	1 to 92.39	High calcium and their flavor when roasted is very good.
Pumpkin & Squash Seeds	1 to 114	We mainly use seeds from the winter squashes we grow.
Cashews	1 to 125.5	
Safflower oil	1 to 132.5	
Sunflower Seeds	1 to 262	We could grow these but bird predation is a big problem.
Brazil Nuts	1 to 587	
Peanuts	1 to 1776	We love peanut butter but the ratio is hard to overcome.
Almonds	1 to 2010	
Oak acorns, Safflower/Coconut oils	1 to infinity	No Omega 3 was listed at all.

The above ratios were derived from the [USDA Nutrient Database](#), except for hemp, camelina, and eggs from pastured chickens. And from Wikipedia, for further information:

List of omega-3 fatty acids

This table lists several different names for the most common omega-3 fatty acids found in nature.

Common name	Lipid name	Chemical name
Hexadecatrienoic acid (HTA)	16:3 (<i>n</i> -3)	<i>all-cis</i> -7,10,13-hexadecatrienoic acid
α-Linolenic acid (ALA)	18:3 (<i>n</i> -3)	<i>all-cis</i> -9,12,15-octadecatrienoic acid
Stearidonic acid (SDA)	18:4 (<i>n</i> -3)	<i>all-cis</i> -6,9,12,15-octadecatetraenoic acid
Eicosatrienoic acid (ETE)	20:3 (<i>n</i> -3)	<i>all-cis</i> -11,14,17-eicosatrienoic acid
Eicosatetraenoic acid (ETA)	20:4 (<i>n</i> -3)	<i>all-cis</i> -8,11,14,17-eicosatetraenoic acid
Eicosapentaenoic acid (EPA)	20:5 (<i>n</i> -3)	<i>all-cis</i> -5,8,11,14,17-eicosapentaenoic acid
Heneicosapentaenoic acid (HPA)	21:5 (<i>n</i> -3)	<i>all-cis</i> -6,9,12,15,18-heneicosapentaenoic acid
Docosapentaenoic acid (DPA), Clupanodonic acid	22:5 (<i>n</i> -3)	<i>all-cis</i> -7,10,13,16,19-docosapentaenoic acid
Docosahexaenoic acid (DHA)	22:6 (<i>n</i> -3)	<i>all-cis</i> -4,7,10,13,16,19-docosahexaenoic acid
Tetracosapentaenoic acid	24:5 (<i>n</i> -3)	<i>all-cis</i> -9,12,15,18,21-tetracosapentaenoic acid
Tetracosahexaenoic acid (Nisinic acid)	24:6 (<i>n</i> -3)	<i>all-cis</i> -6,9,12,15,18,21-tetracosahexaenoic acid

List of omega-6 fatty acids

Common name	Lipid name	Chemical name
<u>Linoleic acid</u> (LA)	18:2 (<i>n</i> -6)	<i>all-cis</i> -9,12-octadecadienoic acid
<u>Gamma-linolenic acid</u> (GLA)	18:3 (<i>n</i> -6)	<i>all-cis</i> -6,9,12-octadecatrienoic acid
<u>Calendic acid</u>	18:3 (<i>n</i> -6)	8E,10E,12Z-octadecatrienoic acid
<u>Eicosadienoic acid</u>	20:2 (<i>n</i> -6)	<i>all-cis</i> -11,14-eicosadienoic acid
<u>Dihomo-gamma-linolenic acid</u> (DGLA)	20:3 (<i>n</i> -6)	<i>all-cis</i> -8,11,14-eicosatrienoic acid
<u>Arachidonic acid</u> (AA)	20:4 (<i>n</i> -6)	<i>all-cis</i> -5,8,11,14-eicosatetraenoic acid
<u>Docosadienoic acid</u>	22:2 (<i>n</i> -6)	<i>all-cis</i> -13,16-docosadienoic acid
<u>Adrenic acid</u>	22:4 (<i>n</i> -6)	<i>all-cis</i> -7,10,13,16-docosatetraenoic acid
<u>Docosapentaenoic acid</u>	22:5 (<i>n</i> -6)	<i>all-cis</i> -4,7,10,13,16-docosapentaenoic acid
<u>Tetracosatetraenoic acid</u>	24:4 (<i>n</i> -6)	<i>all-cis</i> -9,12,15,18-tetracosatetraenoic acid
<u>Tetracosapentaenoic acid</u>	24:5 (<i>n</i> -6)	<i>all-cis</i> -6,9,12,15,18-tetracosapentaenoic acid