

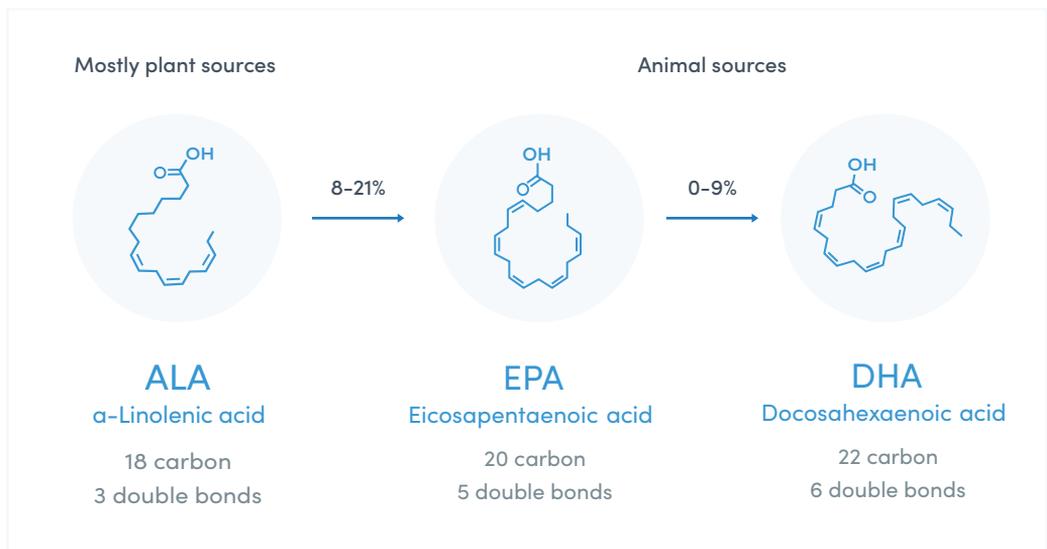
# Omega-3 fatty acids

## What are they?

Commonly referred to as omega-3s or essential fatty acids, omega-3 fatty acids are polyunsaturated fatty acids (PUFAs) consisting of long carbon chains with two or more double bonds. They are known as essential fatty acids because they are a required component of every diet and are necessary to maintain human health.

There are three key omega-3 fats, which include alpha-linolenic acid (ALA), docosahexaenoic acid (DHA), and eicosapentaenoic acid (EPA). ALA, typically derived from plant sources, is converted to DHA and EPA in the body. However, this conversion is limited, making it important to consume DHA and EPA from other sources. Omega-3 fatty acids support the health of many key body functions including cardiovascular, immune, brain, and more.

## Conversion rate of ALA to EPA and DHA



## Omega-3 vs. omega-6 fatty acids

Similarly to omega-3s, omega-6 fatty acids are essential polyunsaturated fats. However, when consumed in excess, omega-6s may contribute to health complications. Diets high in omega-6 and low in omega-3 fatty acids are associated with chronic inflammation and an increased risk of certain chronic diseases, including cardiovascular disease and cancer.

To reduce omega-6 fatty acid intake, minimize consumption of certain oils, including corn, grapeseed, safflower, sesame, and sunflower oil. Focus on foods with a low omega-6 to omega-3 fatty acid ratio, preferably 4:1 or below. Fatty fish are among the best sources of omega-3 fatty acids, however, certain plant-based foods, including flax seed, hemp seeds, and leafy greens, also offer higher amounts of omega-3s.

## Common applications and benefits of omega-3s

- Cardiometabolic health
- Cognitive function and cognitive decline prevention
- Inflammation and pain disorders
- Liver health
- Neurological health
- Prenatal and infant/child health and development
- Psychological health
- Renal health

## Adequate intakes for omega-3 fatty acids

Adequate intake (AI) recommendations for omega-3 fatty acids are provided by the National Academy of Medicine and outline the recommended daily nutrient intake level based on experimentally gathered data and average intakes among different populations of healthy individuals.

Age	Male	Female
0-1 years	0.5 g	0.5 g
1-3 years	0.7 g	0.7 g
4-8 years	0.9 g	0.9 g
9-13 years	1.2 g	1.0 g
14+ years	1.6 g	1.1 g

# Dietary sources of omega-3s

				
<b>Grass-fed beef</b> 0.04 g of ALA/3 oz	<b>Kidney beans</b> 0.10 g of ALA/1/2 cup	<b>Edamame</b> 0.28 g of ALA/1/2 cup	<b>Walnuts</b> 2.57 g of ALA/oz	<b>Flaxseeds</b> 2.35 g of ALA/tbsp
				
<b>Flaxseed oil</b> 7.26 g of ALA/tbsp	<b>Oysters</b> 0.14 g of ALA/3 oz 0.23 g of DHA/3 oz 0.30 g of EPA/3 oz	<b>Wild-caught trout</b> 0.44 g of DHA/3 oz 0.40 g of EPA/3 oz	<b>Herring</b> 0.94 g of DHA/3 oz 0.77 g of EPA/3 oz	<b>Wild-caught salmon</b> 1.22 g of DHA/3 oz 0.35 g of EPA/3 oz

 Vegetarian and vegan-friendly

# Omega-3 supplements

Increasing your intake by consuming foods rich in omega-3s is ideal. However, omega-3 fatty acids can also be consumed in supplement form. Omega-3 supplements are commonly produced from various seafood sources and vegetarian-suitable algae.



Algal oil



Krill oil



Fish oil



Cod liver oil

When selecting an omega-3 supplement, search for brands that have been third-party certified for quality and safety. Consult your integrative healthcare provider regarding dosing and to determine whether omega-3 supplements are right for you.



National Sanitation  
Foundation



United States  
Pharmacopeia



International Fish  
Oil Standards

# References

1. Barden, A. E., Shinde, S., Burke, V., Puddey, I. B., Beilin, L. J., Irish, A. B., ... Mori, T. A. (2018). The effect of n-3 fatty acids and coenzyme Q10 supplementation on neutrophil leukotrienes, mediators of inflammation resolution and myeloperoxidase in chronic kidney disease. *Prostaglandins & Other Lipid Mediators*, 136, 1–8.
2. Burdge, G. C., & Wootton, S. A. (2002). Conversion of alpha-linolenic acid to eicosapentaenoic, docosapentaenoic and docosahexaenoic acids in young women. *The British journal of nutrition*, 88(4), 411–420.
3. Burdge, G. C., Jones, A. E., & Wootton, S. A. (2002). Eicosapentaenoic and docosapentaenoic acids are the principal products of alpha-linolenic acid metabolism in young men. *The British journal of nutrition*, 88(4), 355–363.
4. Haghavan, S., Keshavarz, S. A., Mazaheri, R., Alizadeh, Z., & Mansournia, M. A. (2016). Effect of omega-3 PUFAs supplementation with lifestyle modification on anthropometric indices and Vo2 max in overweight women. *Arch Iran Med*, 19(5), 342–347.
5. Hu, Y., Hu, F. B., & Manson, J. E. (2019). Marine omega-3 supplementation and cardiovascular disease: An updated meta-analysis of 13 randomized controlled trials involving 127 477 participants. *Journal of the American Heart Association*, 8(19), e013543.
6. Imhoff-Kunsch, B., Briggs, V., Goldenberg, T., & Ramakrishnan, U. (2012). Effect of n-3 long-chain polyunsaturated fatty acid intake during pregnancy on maternal, infant, and child health outcomes: A systematic review. *Paediatric and Perinatal Epidemiology*, 26, 91–107.
7. National Center for Biotechnology Information. (n.d.-a). Docosahexaenoic acid. Retrieved September 1, 2020, from <https://pubchem.ncbi.nlm.nih.gov/compound/Docosahexaenoic-acid>
8. National Center for Biotechnology Information. (n.d.-b). Eicosapentaenoic acid. Retrieved September 1, 2020, from <https://pubchem.ncbi.nlm.nih.gov/compound/Eicosapentaenoic-acid>
9. National Center for Biotechnology Information. (n.d.-c). Linolenic acid. Retrieved September 1, 2020, from <https://pubchem.ncbi.nlm.nih.gov/compound/Linolenic-acid>
10. National Institutes of Health. (2019, October 17). Omega-3 fatty acids. Retrieved from <https://ods.od.nih.gov/factsheets/Omega3FattyAcids-HealthProfessional/>
11. Russo, G. L. (2009). Dietary n-6 and n-3 polyunsaturated fatty acids: From biochemistry to clinical implications in cardiovascular prevention. *Biochemical Pharmacology*, 77(6), 937–946.
12. Simopoulos, A. P. (2008). The importance of the omega-6/omega-3 fatty acid ratio in cardiovascular disease and other chronic diseases. *Experimental Biology and Medicine*, 233(6), 674–688.
13. U.S. Department of Agriculture. (n.d.). FoodData Central. Retrieved September 1, 2020, from <https://fdc.nal.usda.gov/>

