GOED OMEGA-3

The ABCs of Omega-3s

Why You Should Focus on EPA+DHA

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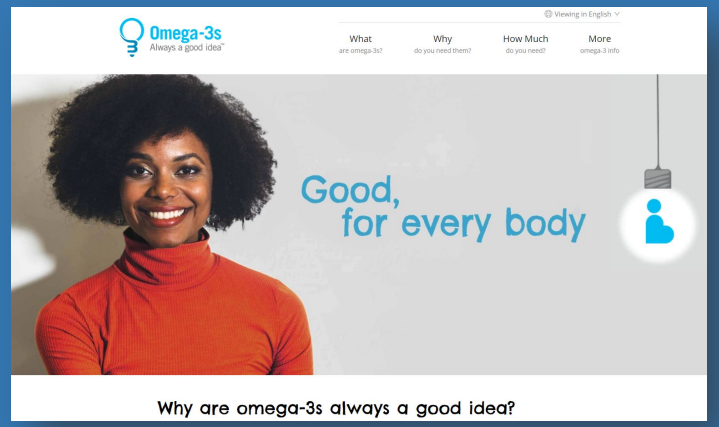
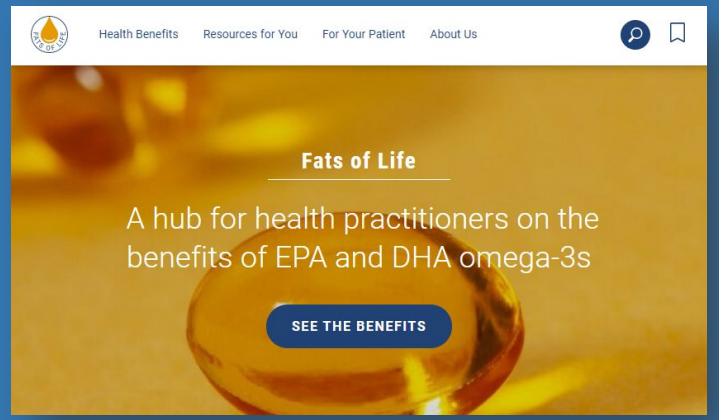
A Bit of Background…

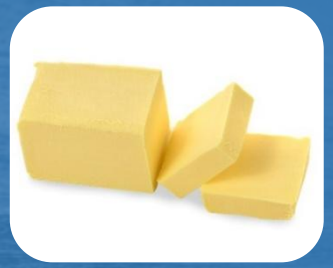
- **GOED:** The Global Organization for EPA and DHA Omega-3s
  - Omega-3 trade association
  - Global in reach, 180 members
- Goals:
  - Increase consumption of **EPA and DHA omega-3s** to impact public health
  - Ensure the industry is producing quality omega-3 products that consumers can trust
- Online at:
  - GOEDomega3.com (Members)
  - AlwaysOmega3s.com (Consumers)
  - FatsOfLife.com (Healthcare Professionals)





Fats: Quick Overview

- Saturated
- Unsaturated
  - Monounsaturated
  - Polyunsaturated
    - Omega-6
    - Omega-3
      - **ALA**
      - **EPA**
      - **DHA**

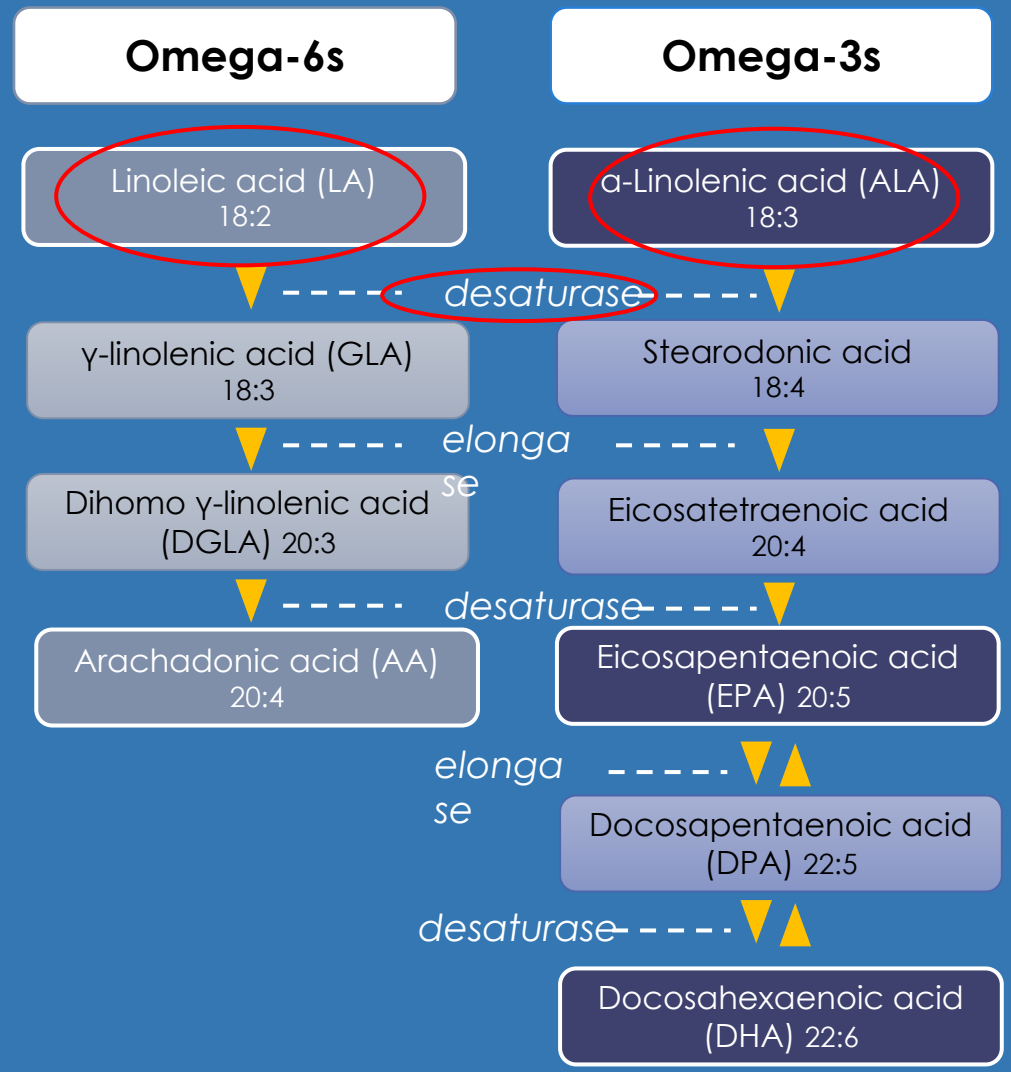


Essential Fatty Acids and Why That Matters

Are Omega-3s Essential? Yes, but…

- Essential = must come from diet; cannot be generated in the body
- ALA → **EPA** = low
- ALA → **EPA** → **DHA** = lower

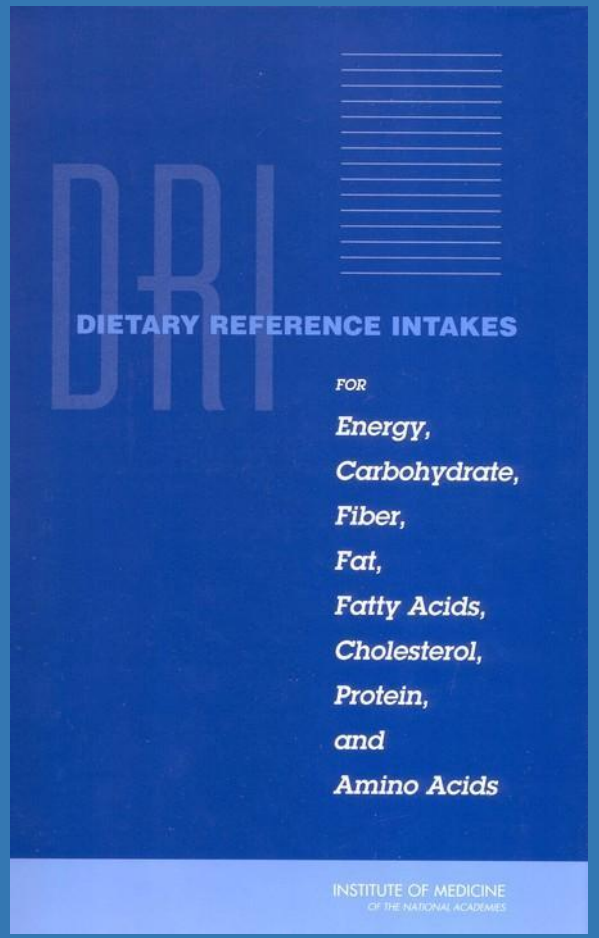
Best to consume EPA+DHA directly



Adapted from Linus Pauling Institute, Oregon State University, Essential Fatty Acids, Figures 2 and 3
https://lpi.oregonstate.edu/mic/other-nutrients/essential-fatty-acids

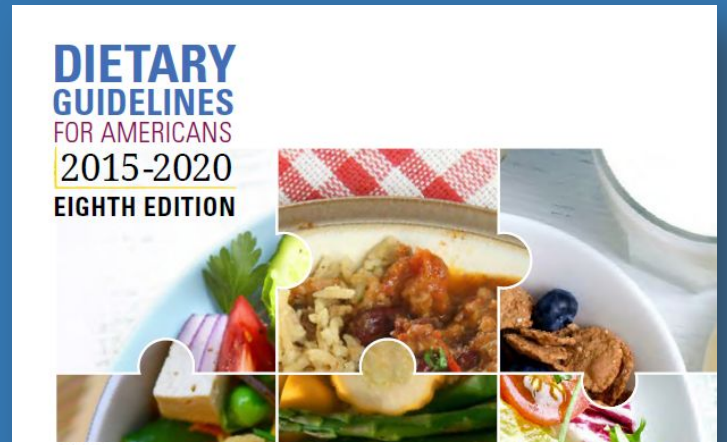
Omega-3 Intake Needs

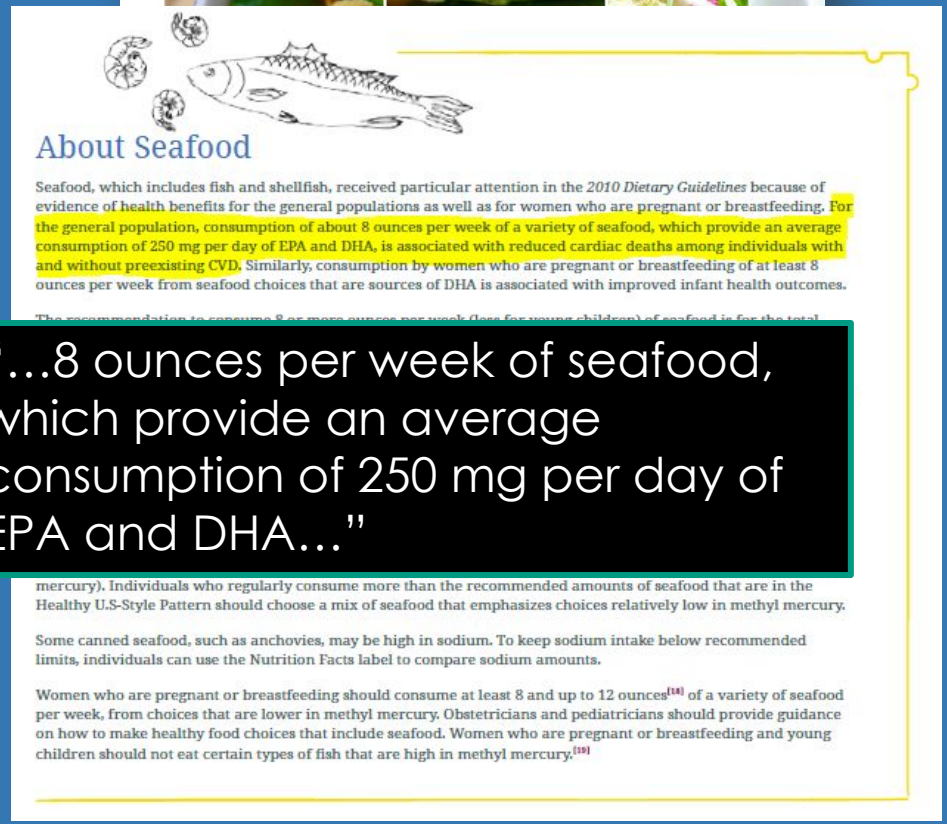
- Dietary Reference Intake (DRI)
  - Yes for ALA
  - No for EPA and DHA



Omega-3 Intake Needs

- Dietary Guidelines for Americans 2015-2020
  - 250-500 mg EPA+DHA/day





About Seafood

Seafood, which includes fish and shellfish, received particular attention in the *2010 Dietary Guidelines* because of evidence of health benefits for the general populations as well as for women who are pregnant or breastfeeding. For the general population, consumption of about 8 ounces per week of a variety of seafood, which provide an average consumption of 250 mg per day of EPA and DHA, is associated with reduced cardiac deaths among individuals with and without preexisting CVD. Similarly, consumption by women who are pregnant or breastfeeding of at least 8 ounces per week from seafood choices that are sources of DHA is associated with improved infant health outcomes.

"…8 ounces per week of seafood, which provide an average consumption of 250 mg per day of EPA and DHA…"

mercury). Individuals who regularly consume more than the recommended amounts of seafood that are in the Healthy U.S-Style Pattern should choose a mix of seafood that emphasizes choices relatively low in methyl mercury.

Some canned seafood, such as anchovies, may be high in sodium. To keep sodium intake below recommended limits, individuals can use the Nutrition Facts label to compare sodium amounts.

Women who are pregnant or breastfeeding should consume at least 8 and up to 12 ounces[18] of a variety of seafood per week, from choices that are lower in methyl mercury. Obstetricians and pediatricians should provide guidance on how to make healthy food choices that include seafood. Women who are pregnant or breastfeeding and young children should not eat certain types of fish that are high in methyl mercury.[19]

Omega-3 Intake Needs

Organization	Recommendation
ISSFAL (International Society for the Study of Fatty Acids and Lipids)[1]	At least 500 mg EPA+DHA/ day
UN FAO (United Nations Food and Agricultural Organization)[2]	250-2000 mg/day
EFSA (European Food Safety Authority)[3]	250 mg EPA+DHA/day
Dietary Guidelines for Americans 2015-2020	250-500 mg EPA+DHA/day

1. ISSFAL PUFA Recommendations: https://www.issfal.org/pufa-recommendations.
2. Fats and Fatty Acids in Human Nutrition: report of an expert consultation. FAO and Food and Nutrition Paper 91. 2010. ISSN 0254-4725.
3. EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA); Scientific Opinion on Dietary Reference Values for fats, including saturated fatty acids, polyunsaturated fatty acids, monounsaturated fatty acids, trans fatty acids, and cholesterol. EFSA Journal 2010; 8(3):1461. [107 pp.]. doi:10.2903/j.efsa.2010.1461. Available online: www.efsa.europa.eu

Omega-3 Intake Needs

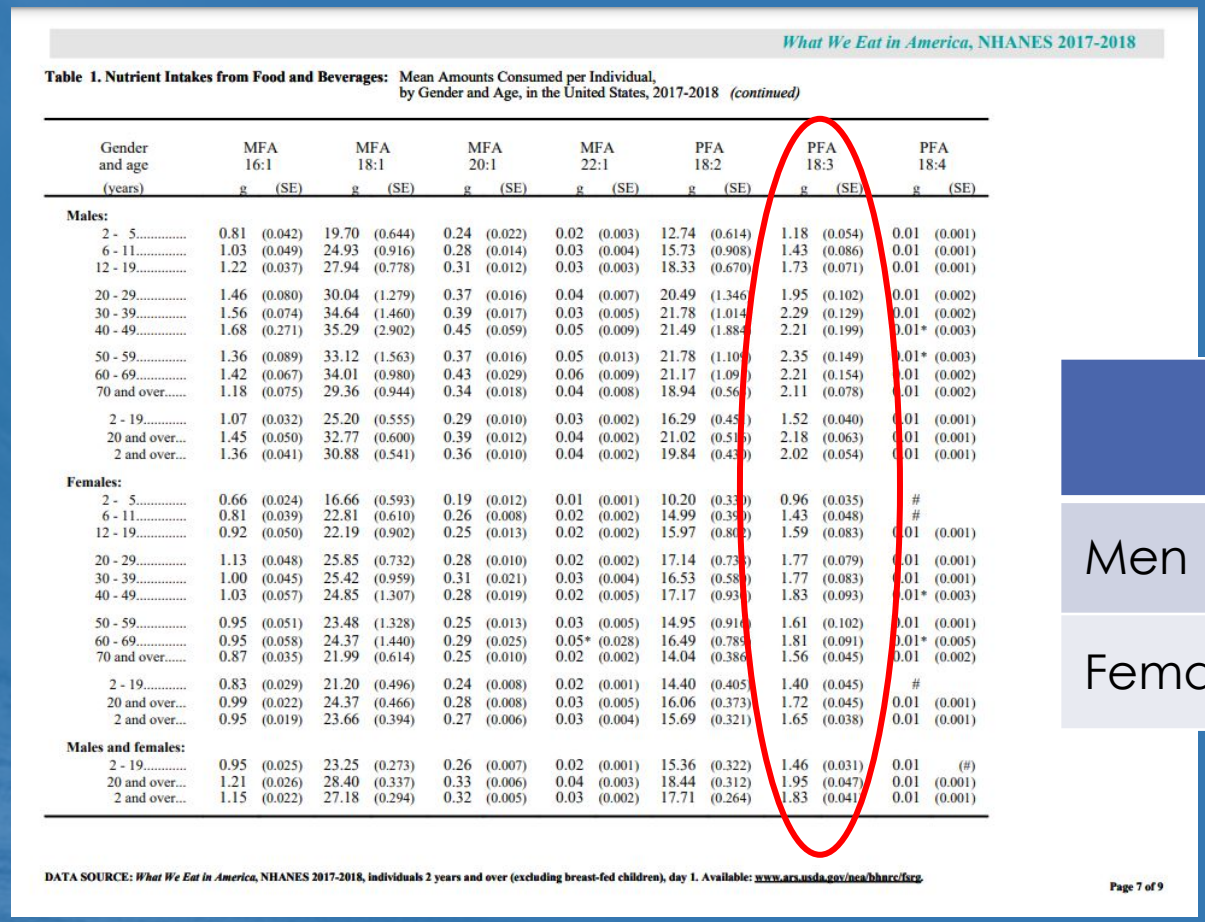
Age	Male	Female
Birth to 6 months[1]	0.5 g	0.5 g
7-12 months[1]	0.5 g	0.5 g
1-3 years[2]	0.7 g	0.7 g
4-8 years[2]	0.9 g	0.9 g
9-13 years[2]	1.2 g	1.0 g
14-18 years[2]	1.6 g	1.1 g
19-50 years[2]	1.6 g	1.1 g
51 years and older[2]	1.6 g	1.1 g

[1] as total omega-3s
[2] as ALA omega-3s

Pregnancy[2]	Lactation[2]
1.4 g	1.3 g

Institute of Medicine, Food and Nutrition Board. Dietary reference intakes for energy, carbohydrate, fiber, fat, fatty acids, cholesterol, protein, and amino acids (macronutrients). Washington, DC: National Academy Press; 2005. https://ods.od.nih.gov/factsheets/Omega3FattyAcids-HealthProfessional/#en5

ALA Omega-3 Intake is Adequate



What We Eat in America, NHANES 2017-2018

Table 1. Nutrient Intakes from Food and Beverages: Mean Amounts Consumed per Individual, by Gender and Age, in the United States, 2017-2018 *(continued)*

Gender and age (years)	MFA 16:1 g	(SE)	MFA 18:1 g	(SE)	MFA 20:1 g	(SE)	MFA 22:1 g	(SE)	PFA 18:2 g	(SE)	PFA 18:3 g	(SE)	PFA 18:4 g	(SE)
Males:														
2 - 5	0.81	(0.042)	19.70	(0.644)	0.24	(0.022)	0.02	(0.003)	12.74	(0.614)	1.18	(0.054)	0.01	(0.001)
6 - 11	1.03	(0.049)	24.93	(0.916)	0.28	(0.014)	0.03	(0.004)	15.73	(0.908)	1.43	(0.086)	0.01	(0.001)
12 - 19	1.22	(0.037)	27.94	(0.778)	0.31	(0.012)	0.03	(0.003)	18.33	(0.670)	1.73	(0.071)	0.01	(0.001)
20 - 29	1.46	(0.080)	30.04	(1.279)	0.37	(0.016)	0.04	(0.007)	20.49	(1.346)	1.95	(0.102)	0.01	(0.002)
30 - 39	1.56	(0.074)	34.64	(1.460)	0.39	(0.017)	0.03	(0.005)	21.78	(1.014)	2.29	(0.129)	0.01	(0.002)
40 - 49	1.68	(0.271)	35.29	(2.902)	0.45	(0.059)	0.05	(0.009)	21.49	(1.884)	2.21	(0.199)	0.01*	(0.003)
50 - 59	1.36	(0.089)	33.12	(1.563)	0.37	(0.016)	0.05	(0.013)	21.78	(1.109)	2.35	(0.149)	0.01*	(0.003)
60 - 69	1.42	(0.067)	34.01	(0.980)	0.43	(0.029)	0.06	(0.009)	21.17	(1.098)	2.21	(0.154)	0.01	(0.002)
70 and over	1.18	(0.075)	29.36	(0.944)	0.34	(0.018)	0.04	(0.008)	18.94	(0.566)	2.11	(0.078)	0.01	(0.002)
2 - 19	1.07	(0.032)	25.20	(0.555)	0.29	(0.010)	0.03	(0.002)	16.29	(0.458)	1.52	(0.040)	0.01	(0.001)
20 and over	1.45	(0.050)	32.77	(0.600)	0.39	(0.012)	0.04	(0.002)	21.02	(0.516)	2.18	(0.063)	0.01	(0.001)
2 and over	1.36	(0.041)	30.88	(0.541)	0.36	(0.010)	0.04	(0.002)	19.84	(0.430)	2.02	(0.054)	0.01	(0.001)
Females:														
2 - 5	0.66	(0.024)	16.66	(0.593)	0.19	(0.012)	0.01	(0.001)	10.20	(0.339)	0.96	(0.035)	#	
6 - 11	0.81	(0.039)	22.81	(0.610)	0.26	(0.008)	0.02	(0.002)	14.99	(0.350)	1.43	(0.048)	#	
12 - 19	0.92	(0.050)	22.19	(0.902)	0.25	(0.013)	0.02	(0.002)	15.97	(0.802)	1.59	(0.083)	0.01	(0.001)
20 - 29	1.13	(0.048)	25.85	(0.732)	0.28	(0.010)	0.02	(0.002)	17.14	(0.736)	1.77	(0.079)	0.01	(0.001)
30 - 39	1.00	(0.045)	25.42	(0.959)	0.31	(0.021)	0.03	(0.004)	16.53	(0.588)	1.77	(0.083)	0.01	(0.001)
40 - 49	1.03	(0.057)	24.85	(1.307)	0.28	(0.019)	0.02	(0.005)	17.17	(0.936)	1.83	(0.093)	0.01*	(0.003)
50 - 59	0.95	(0.051)	23.48	(1.328)	0.25	(0.013)	0.03	(0.005)	14.95	(0.916)	1.61	(0.102)	0.01	(0.001)
60 - 69	0.95	(0.058)	24.37	(1.440)	0.29	(0.025)	0.05*	(0.028)	16.49	(0.789)	1.81	(0.091)	0.01*	(0.005)
70 and over	0.87	(0.035)	21.99	(0.614)	0.25	(0.010)	0.02	(0.002)	14.04	(0.386)	1.56	(0.045)	0.01	(0.002)
2 - 19	0.83	(0.029)	21.20	(0.496)	0.24	(0.008)	0.02	(0.001)	14.40	(0.405)	1.40	(0.045)	#	
20 and over	0.99	(0.022)	24.37	(0.466)	0.28	(0.008)	0.03	(0.005)	16.06	(0.373)	1.72	(0.045)	0.01	(0.001)
2 and over	0.95	(0.019)	23.66	(0.394)	0.27	(0.006)	0.03	(0.004)	15.69	(0.321)	1.65	(0.038)	0.01	(0.001)
Males and females:														
2 - 19	0.95	(0.025)	23.25	(0.273)	0.26	(0.007)	0.02	(0.001)	15.36	(0.322)	1.46	(0.031)	0.01	(#)
20 and over	1.21	(0.026)	28.40	(0.337)	0.33	(0.006)	0.04	(0.003)	18.44	(0.312)	1.95	(0.047)	0.01	(0.001)
2 and over	1.15	(0.022)	27.18	(0.294)	0.32	(0.005)	0.03	(0.002)	17.71	(0.264)	1.83	(0.041)	0.01	(0.001)

DATA SOURCE: *What We Eat in America*, NHANES 2017-2018, individuals 2 years and over (excluding breast-fed children), day 1. Available: www.ars.usda.gov/nea/bhnrc/fsrg.

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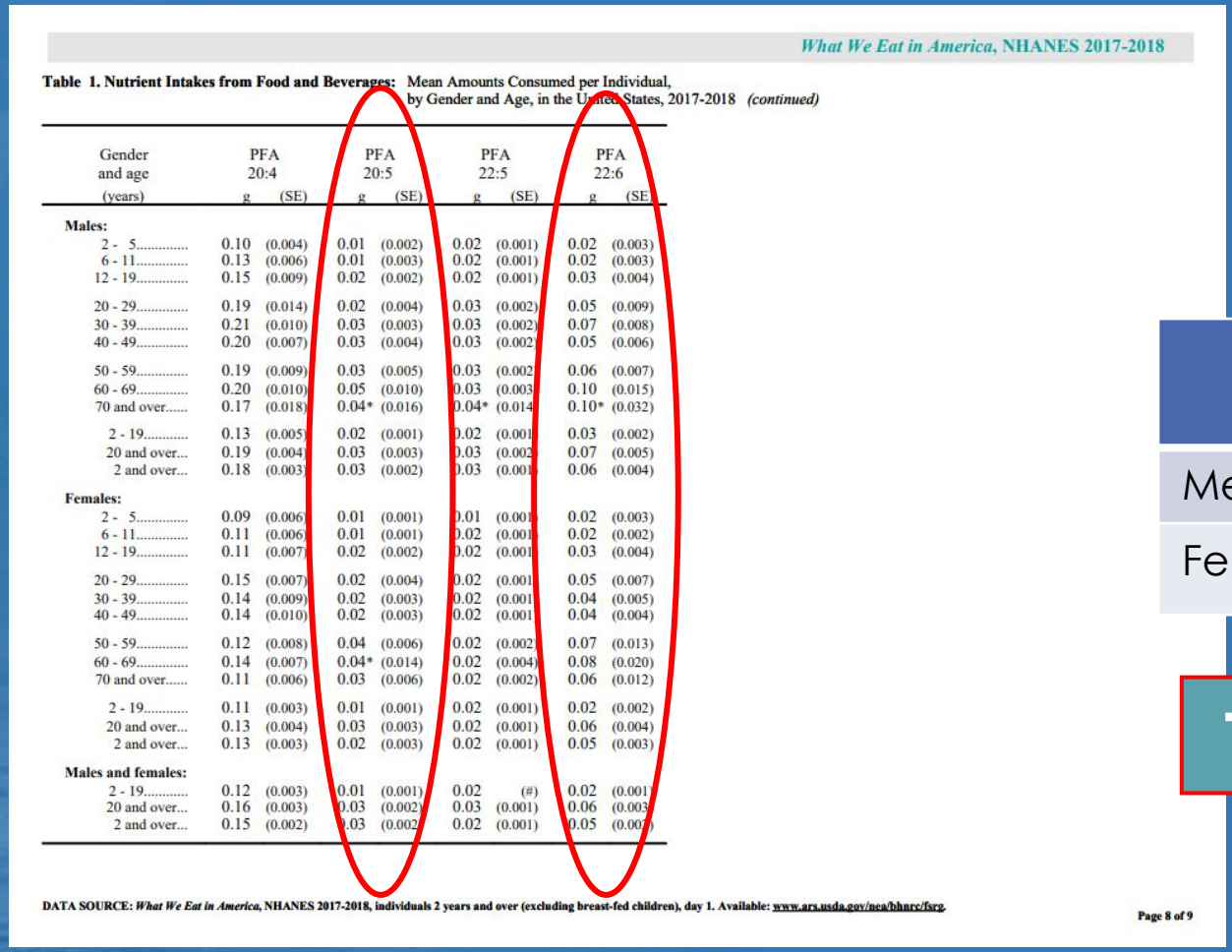
Children and adults are ***getting the recommended amounts*** of ALA omega-3s

	Adequate Intake (AI)	Actual Intake
Men (20+)	1.6 g	**2.18** g
Females (20+)	1.1 g	**1.72** g

U.S. Department of Agriculture, Agricultural Research Service. 2020. Nutrient Intakes from Food and Beverages: Mean Amounts Consumed per Individual, by Gender and Age, What We Eat in America, NHANES 2017-2018.

EPA + DHA Omega-3 Intake is Low



What We Eat in America, NHANES 2017-2018

Table 1. Nutrient Intakes from Food and Beverages: Mean Amounts Consumed per Individual, by Gender and Age, in the United States, 2017-2018 *(continued)*

Gender and age (years)	PFA 20:4 g	(SE)	PFA 20:5 g	(SE)	PFA 22:5 g	(SE)	PFA 22:6 g	(SE)
Males:								
2 - 5	0.10	(0.004)	0.01	(0.002)	0.02	(0.001)	0.02	(0.003)
6 - 11	0.13	(0.006)	0.01	(0.003)	0.02	(0.001)	0.02	(0.003)
12 - 19	0.15	(0.009)	0.02	(0.002)	0.02	(0.001)	0.03	(0.004)
20 - 29	0.19	(0.014)	0.02	(0.004)	0.03	(0.002)	0.05	(0.009)
30 - 39	0.21	(0.010)	0.03	(0.003)	0.03	(0.002)	0.07	(0.008)
40 - 49	0.20	(0.007)	0.03	(0.004)	0.03	(0.002)	0.05	(0.006)
50 - 59	0.19	(0.009)	0.03	(0.005)	0.03	(0.002)	0.06	(0.007)
60 - 69	0.20	(0.010)	0.05	(0.010)	0.03	(0.003)	0.10	(0.015)
70 and over	0.17	(0.018)	0.04*	(0.016)	0.04*	(0.014)	0.10*	(0.032)
2 - 19	0.13	(0.005)	0.02	(0.001)	0.02	(0.001)	0.03	(0.002)
20 and over	0.19	(0.004)	0.03	(0.003)	0.03	(0.002)	0.07	(0.005)
2 and over	0.18	(0.003)	0.03	(0.002)	0.03	(0.001)	0.06	(0.004)
Females:								
2 - 5	0.09	(0.006)	0.01	(0.001)	0.01	(0.001)	0.02	(0.003)
6 - 11	0.11	(0.006)	0.01	(0.001)	0.02	(0.001)	0.02	(0.002)
12 - 19	0.11	(0.007)	0.02	(0.002)	0.02	(0.001)	0.03	(0.004)
20 - 29	0.15	(0.007)	0.02	(0.004)	0.02	(0.001)	0.05	(0.007)
30 - 39	0.14	(0.009)	0.02	(0.003)	0.02	(0.001)	0.04	(0.005)
40 - 49	0.14	(0.010)	0.02	(0.003)	0.02	(0.001)	0.04	(0.004)
50 - 59	0.12	(0.008)	0.04	(0.006)	0.02	(0.002)	0.07	(0.013)
60 - 69	0.14	(0.007)	0.04*	(0.014)	0.02	(0.004)	0.08	(0.020)
70 and over	0.11	(0.006)	0.03	(0.006)	0.02	(0.002)	0.06	(0.012)
2 - 19	0.11	(0.003)	0.01	(0.001)	0.02	(0.001)	0.02	(0.002)
20 and over	0.13	(0.004)	0.03	(0.003)	0.02	(0.001)	0.06	(0.004)
2 and over	0.13	(0.003)	0.02	(0.003)	0.02	(0.001)	0.05	(0.003)
Males and females:								
2 - 19	0.12	(0.003)	0.01	(0.001)	0.02	(#)	0.02	(0.001)
20 and over	0.16	(0.003)	0.03	(0.002)	0.03	(0.001)	0.06	(0.003)
2 and over	0.15	(0.002)	0.03	(0.002)	0.02	(0.001)	0.05	(0.002)

DATA SOURCE: *What We Eat in America*, NHANES 2017-2018, individuals 2 years and over (excluding breast-fed children), day 1. Available: www.ars.usda.gov/nea/bhnrc/fsrg

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Children and adults are ***not getting enough*** EPA+DHA omega-3s

	Recommended Amount (DGA)	Actual Intake
Men (20+)	250 mg	**100** mg
Females (20+)	250 mg	**90** mg

This amount may be too low!

U.S. Department of Agriculture, Agricultural Research Service. 2020. Nutrient Intakes from Food and Beverages: Mean Amounts Consumed per Individual, by Gender and Age, What We Eat in America, NHANES 2017-2018.

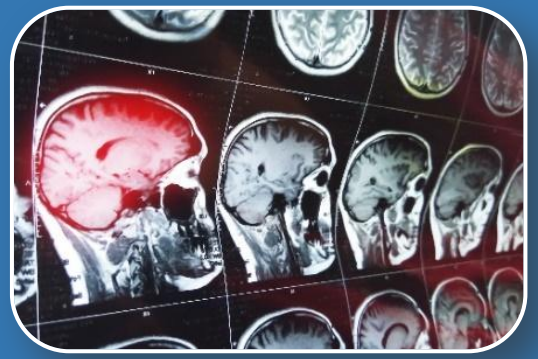
Why You Need Omega-3s

Omega-3s and Prenatal Health

- Brain development
  - Attention
  - Motor function
- Retinal development
  - Visual development
- Preterm birth risk
- Low birth weight

Omega-3s and Brain Health

- DHA concentrated in the brain
- Improvements in cognition and working memory
  - May prevent cognitive decline
- Emerging research on EPA/DHA and mental health:
  - ADHD[1]
  - Major depressive disorder (MDD)[2]
  - Bipolar disorder[3]
  - Schizophrenia[4]
- Potential for treatment of traumatic brain injury (TBI)[5]



1. Chang et al. Neuropsychopharmacology. 2018;43(3):534-545.
2. Lin et al. Biol Psychiatry. 2010;68(2):140-147.
3. McNamara & Welge. Bipolar Disord. 2016;18(3):300-306.
4. van der Kamp et al. Schizophr Res. 2012;14(2-3):153-161.
5. Gupta et al. Curr Rev Musculoskelet Med. 2019;12(2):117-123.

Omega-3s and Eye Health

- DHA concentrated in the retina of the eye
- Important in early development
- Some indication of omega-3s and dry eye, age-related macular degeneration

Omega-3s and Heart Health

- Reduces risk of mortality from coronary heart disease or sudden cardiac death[1]
- Reduces risk of myocardial infarction (heart attack)[2]
- Lowers triglycerides[3]
- Improves blood vessel function[4]
- Lowers blood pressure[5]

1. https://nesr.usda.gov/sites/default/files/2020-07/DFS_dietary-fat-cardiovascular-disease%20-%20SR_1.pdf.
2. Bernasconi AA, Weist MM, Lavie CJ, Milani RV and Laukkanen JA. Effect of omega-3 dosage on cardiovascular outcomes: an updated meta-analysis and meta-regression of interventional trials. *Mayo Clin Proc* 2020. Epub Sept. 17, 2020. DOI: https://doi.org/10.1016/j.mayocp.2020.08.034.
3. Eslick GD, Howe PR, Smith C, Priest R, Bensoussan A. Benefits of fish oil supplementation in hyperlipidemia: a systematic review and meta-analysis. Int J Cardiol. 2009;136:4-16.
4. Nestel P, Shige H, Pomeroy S, Cehun M, Abbey M, Raederstorff D. The n-3 fatty acids eicosapentaenoic acid and docosahexaenoic acid increase systemic arterial compliance in humans. Am J Clin Nutr. 2002;76:326-30.
5. Miller PE, Van Elswyk M, Alexander DD. Long-chain omega-3 fatty acids eicosapentaenoic acid and docosahexaenoic acid and blood pressure: a meta-analysis of randomized controlled trials. Am J Hyperten. 2014;27:885-96.

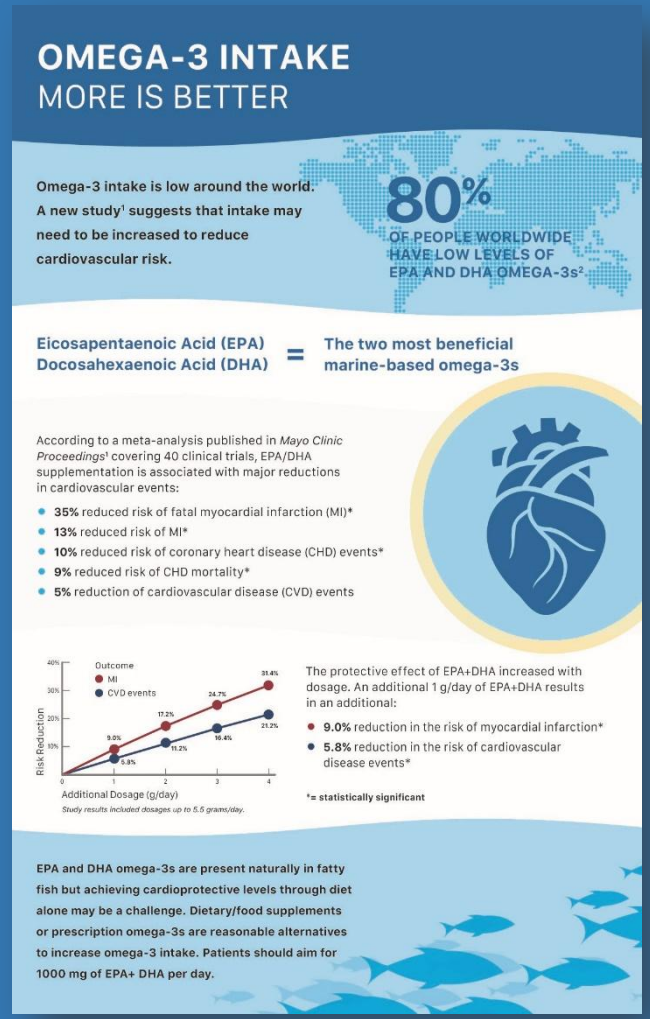
More Just Might Be Better…

- "…marine omega-3 supplementation was associated with **a significantly lower risk** for myocardial infarction, CHD death, total CHD, CVD death, and total CVD."
- "Risk reductions appeared to be **linearly related** to marine omega-3 dose."

Hu Y, Hu FB and Manson JE. Marine omega-3 supplementation and cardiovascular disease: and updated meta-analysis of 13 randomized controlled trials involving 127,477 participants. J Am Heart Assoc. 2019 Oct;8(19):e013543. doi: 10.1161/JAHA.119.013543. Epub 2019 Sep 30.

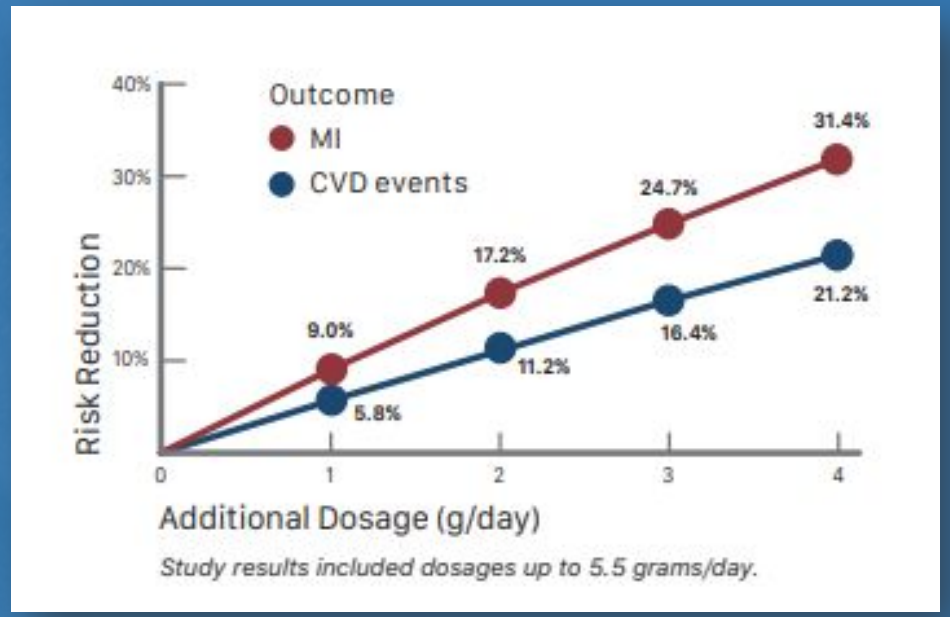
More Just Might Be Better…

- Omega-3 supplementation is associated with reduced risk of:
  - Myocardial infarction (MI, or heart attack): **13%**
  - Fatal MI: **35%**
  - Coronary heart disease (CHD) events: **10%**
  - CHD mortality: **9%**



Bernasconi AA, Weist MM, Lavie CJ, Milani RV and Laukkanen JA. Effect of omega-3 dosage on cardiovascular outcomes: an updated meta-analysis and meta-regression of interventional trials. *Mayo Clin Proc* 2020. Epub Sept. 17, 2020. DOI: https://doi.org/10.1016/j.mayocp.2020.08.034.

More Just Might Be Better…



- Adding 1g (1,000mg)/day of omega-3 is associated with reduced risk of:
  - Heart attack: **9.0%**
  - CVD events: **5.8%**
- **Effects increased with dosage**

Bernasconi AA, Weist MM, Lavie CJ, Milani RV and Laukkanen JA. Effect of omega-3 dosage on cardiovascular outcomes: an updated meta-analysis and meta-regression of interventional trials. *Mayo Clin Proc* 2020. Epub Sept. 17, 2020. DOI: https://doi.org/10.1016/j.mayocp.2020.08.034.

“Get More Omega-3s”

"Get More Omega-3s" → "Get More *EPA and DHA Omega-3s*"

How to Boost *EPA and DHA* Omega-3s

≅ 250 mg daily average EPA+DHA

Must get at least two servings ***each week***

Fish servings can't be poor sources of omega-3s

Choose the *Right* Fish for Omega-3s

SM
AS
H

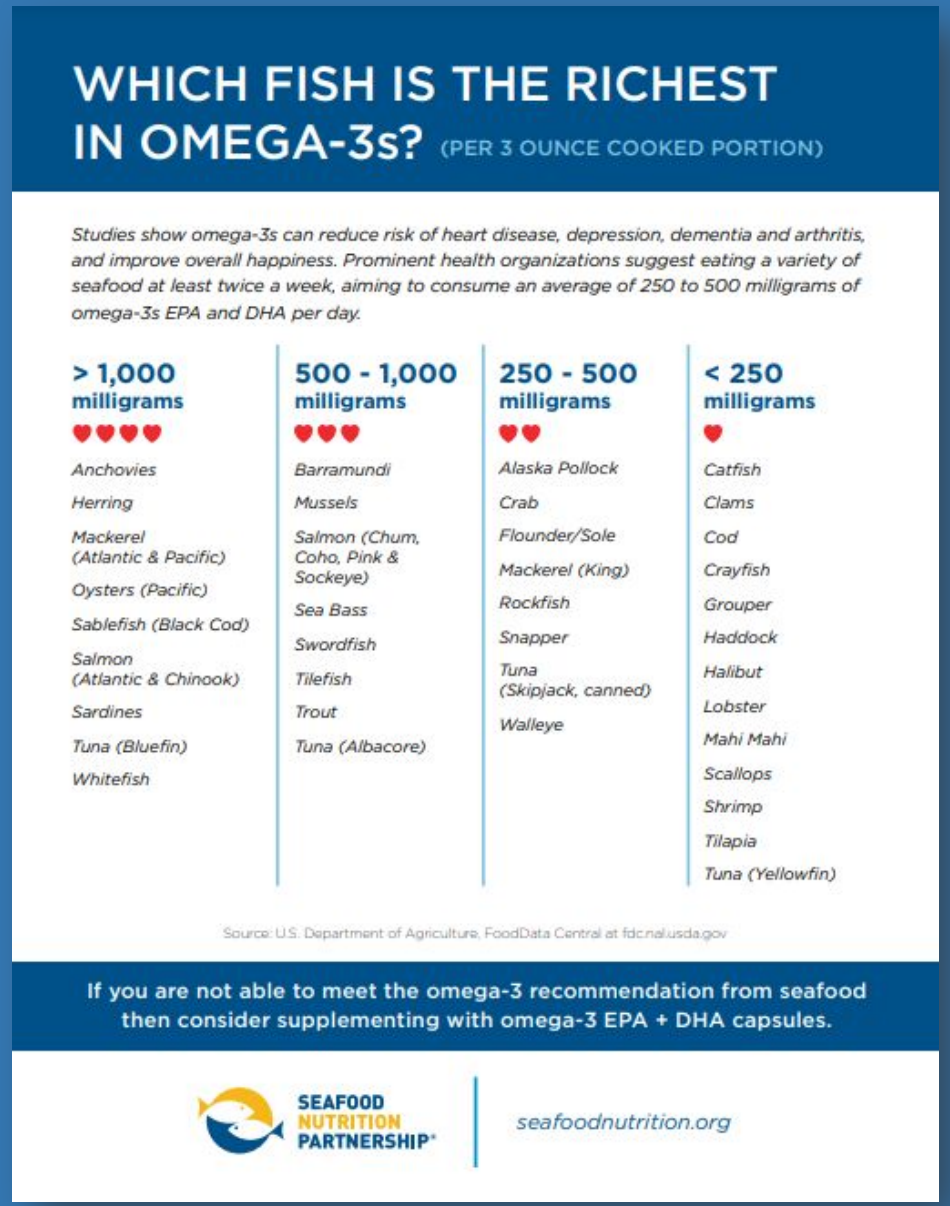
Salmon

Mackerel

Anchovies

Sardines

Herring



WHICH FISH IS THE RICHEST IN OMEGA-3s? (PER 3 OUNCE COOKED PORTION)

Studies show omega-3s can reduce risk of heart disease, depression, dementia and arthritis, and improve overall happiness. Prominent health organizations suggest eating a variety of seafood at least twice a week, aiming to consume an average of 250 to 500 milligrams of omega-3s EPA and DHA per day.

> 1,000 milligrams	500 - 1,000 milligrams	250 - 500 milligrams	< 250 milligrams
Anchovies	Barramundi	Alaska Pollock	Catfish
Herring	Mussels	Crab	Clams
Mackerel (Atlantic & Pacific)	Salmon (Chum, Coho, Pink & Sockeye)	Flounder/Sole	Cod
Oysters (Pacific)	Sea Bass	Mackerel (King)	Crayfish
Sablefish (Black Cod)	Swordfish	Rockfish	Grouper
Salmon (Atlantic & Chinook)	Tilefish	Snapper	Haddock
Sardines	Trout	Tuna (Skipjack, canned)	Halibut
Tuna (Bluefin)	Tuna (Albacore)	Walleye	Lobster
Whitefish			Mahi Mahi
			Scallops
			Shrimp
			Tilapia
			Tuna (Yellowfin)

Source: U.S. Department of Agriculture, FoodData Central at fdc.nal.usda.gov

If you are not able to meet the omega-3 recommendation from seafood then consider supplementing with omega-3 EPA + DHA capsules.

SEAFOOD NUTRITION PARTNERSHIP | seafoodnutrition.org

How to Boost *EPA and DHA* Omega-3s

> 250 mg daily average EPA+DHA

How to Boost *EPA and DHA* Omega-3s

Best strategy for boosting levels of EPA+DHA

How to Read a Supplement Label

1

Supplement Facts

Serving Size: **2 Soft Gels**

Amount Per Serving		% Daily Value
Calories	18	
Calories from fat	18	
Total Fat	2.0g	3% 0.1g
Saturated Fat	1%	
Trans Fat	0g	**
Vitamin E (d-alpha tocopherol)	30 I.U.	100%
Omega-3s	**Weight*** **	**Volume %**
EPA (Eicosapentaenoic Acid)	650mg	35%
DHA (Docosahexaenoic Acid)	450mg	25%
Other Omega-3s	180mg	10%
Total Omega-3s	1280mg	3%
Oleic Acid (Omega-9)	56mg	3%

2

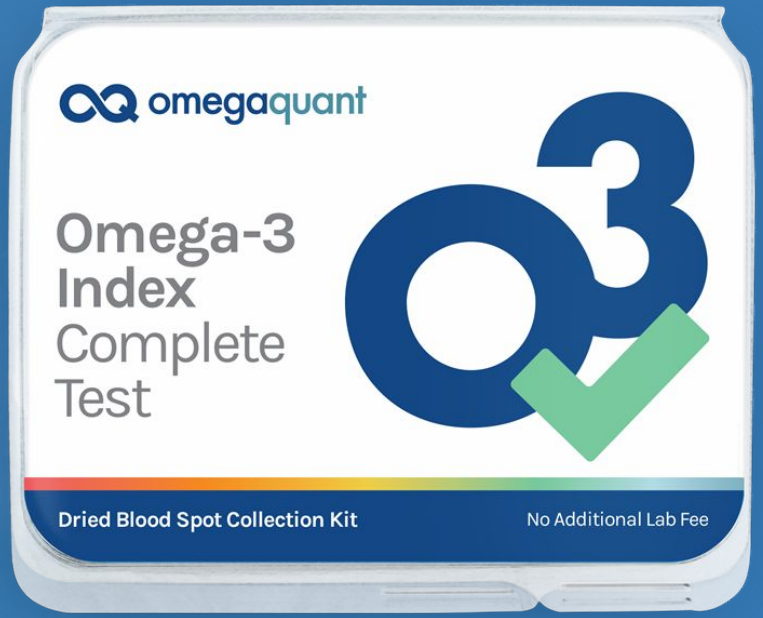
3

* Percent Daily Values are based on a 2,000 calorie diet.
** Daily Value not established. *** Natural Triglycerides.
Less than 5mg of Cholesterol per serving.

4

Ingredients: purified deep sea fish oil (from anchovies and sardines), soft get capsule (gelatin, water, glycerin, natural lemon oil), natural lemon oil, d-alpha tocopherol, rosemary extract.

Know Your Omega-3 Levels



Commonly Asked Questions

Common Consumer Questions

- *Can I get my omega-3s from flax or chia?*

Common Consumer Questions

- ***Can I get my omega-3s from flax or chia?***
  - "ALA does not convert well to EPA and DHA."
  - "Most people get enough ALA but not nearly enough EPA and DHA."
  - "The science is much stronger for EPA and DHA."*

*45,000 published papers; 4,500 human trials

Common Consumer Questions

- ***Why do I need supplements? I eat fish!***

Common Consumer Questions

- ***Why do I need supplements? I eat fish!***
  - "Yes, fish is a great way to get omega-3s – and many other beneficial nutrients – but most people do not get enough omega-3s to protect their heart."
  - "Do you eat the right kind of fish? Fried fish or tilapia won't give you the health benefits you need."
  - "Emerging science* is showing that the advice to eat fatty fish twice a week may not be enough."

*https://www.plefa.com/article/S0952-3278(18)30225-4/fulltext

Common Consumer Questions

- *I've heard omega-3s increase risk of bleeding*

Photo courtesy of Jørn Dyerberg

Common Consumer Questions

- ***I've heard omega-3s increase risk of bleeding***
  - "That is a myth, and research continues to debunk it. A 2017 meta analysis* shows no increase in bleeding or blood transfusions in surgery."
  - "More recently, another paper** showed higher omega-3 PUFA levels are associated with a lower risk of bleeding."

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Dan Med J. 2017 May;64(5). pii: A5366.

No impact of fish oil supplements on bleeding risk: a systematic review.

Begtrup KM[1], Krag AE, Hvas AM.

Author information

Abstract

INTRODUCTION: Fish oil supplementation may inhibit platelet aggregation and can potentially increase the risk of bleeding. The aim of the present systematic review was to evaluate the effect of fish oil supplements on haemostasis and bleeding risk, and to provide recommendations on whether it is necessary to discontinue fish oil supplementation prior to surgery.

METHODS: Studies were identified through PubMed and Embase searches and by reviewing the reference lists of the included papers. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were used. Included in the review were publications including a minimum of 20 healthy subjects and studies on patients who were undergoing surgery and who had fish oil exposure.

RESULTS: In total, 52 publications were included; 32 publications on healthy subjects and 20 publications on patients undergoing surgery. The majority of the included studies were randomised controlled trials or included a control group. Overall, fish oil supplements reduced platelet aggregation in healthy subjects. Fish oil exposure in surgical patients did not increase bleeding or blood transfusions either during or after surgery.

CONCLUSION: Fish oil supplements reduced platelet aggregation in healthy subjects. This biochemical effect was not reflected in increased bleeding risk during or after surgery evaluated in randomised controlled trials. Consequently, this systematic review does not support the need for discontinuation of fish oil supplements prior to surgery or other invasive procedures.

* *https://www.ncbi.nlm.nih.gov/pubmed/28552094*
** *https://www.ncbi.nlm.nih.gov/pubmed/30571332*

Common Consumer Questions

- ***I've heard omega-3s increase risk of bleeding***
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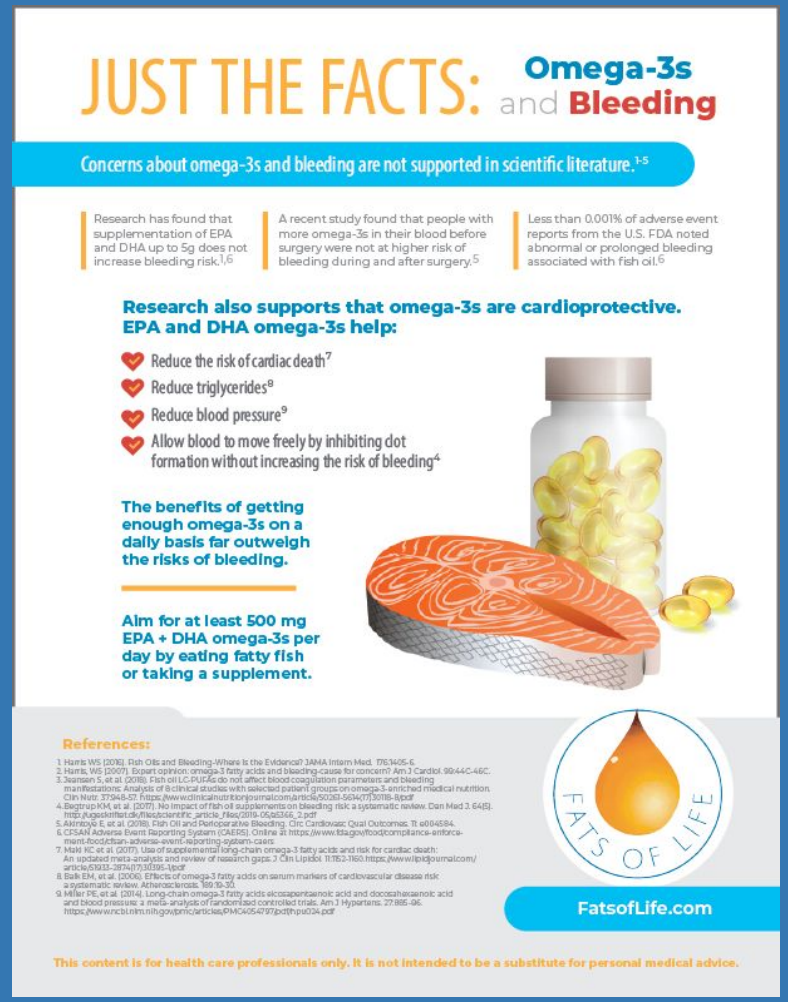


* *https://www.ncbi.nlm.nih.gov/pubmed/28552094*
** *https://www.ncbi.nlm.nih.gov/pubmed/30571332*

Common Consumer Questions

- *I'm concerned about mercury/contaminants*

Common Consumer Questions

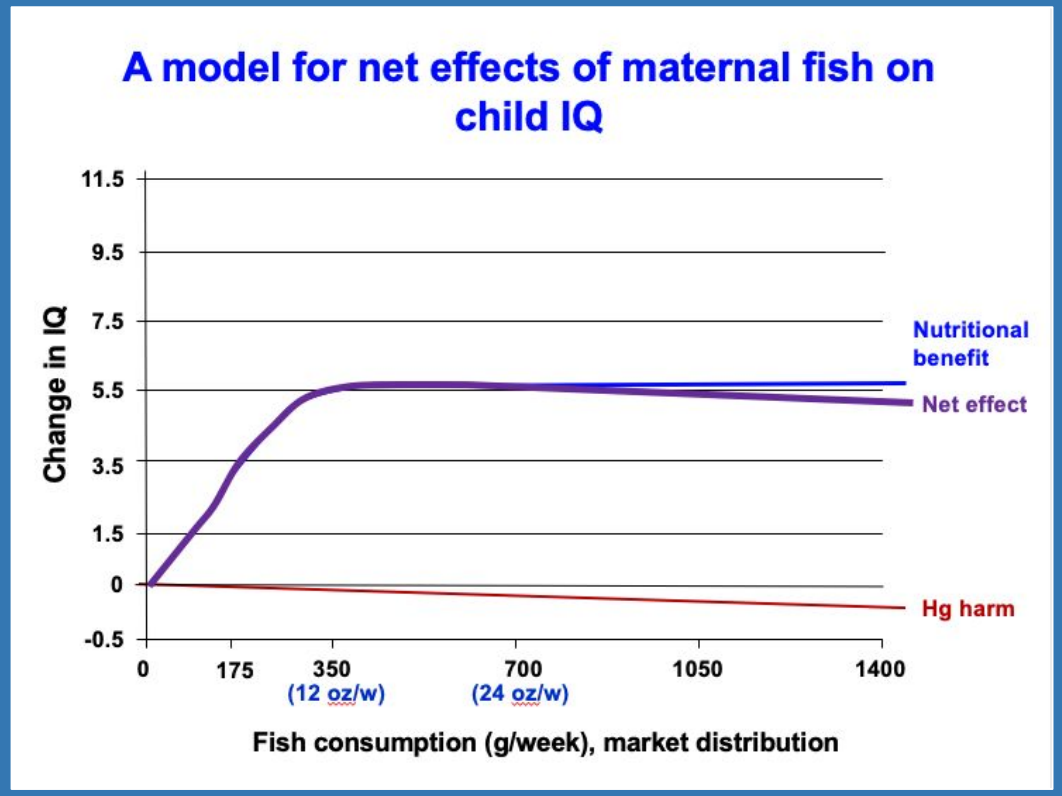
- ***I'm concerned about mercury/contaminants***
  - "The refining process removes contaminants and heavy metals, including mercury."

Common Consumer Questions

- ***I'm concerned about mercury/contaminants***

  - "The benefits of maternal intake of omega-3s outweigh the risks of mercury consumption."
  - Eating up to 12 oz of fish can increase IQ up to 5.5 points. Risks of loss of IQ due to methyl-mercury found in 12 oz of fish is about 0.01 IQ points.
  - Net effects benefit: 5.49 IQ points"

    -Capt. Joseph Hibbeln, MD



Common Consumer Questions

- ***Fish oil production is depleting the oceans!***

Common Consumer Questions

- ***Fish oil production is depleting the oceans!***
  - "In general, the fisheries that supply omega-3s are sustainably managed."
  - "The Peruvian anchovy fishery, which supplies most supplements, is monitored by a scientific body that mandates the quota for each fishing season based on the biomass and number of juveniles. They recently cancelled two fishing seasons."
  - "Tuna and salmon oil come from byproducts of seafood industry."
  - "Arctic cod fishery is MSC-certified."

Summary:

- ALA, EPA and DHA are all omega-3s, but we need more EPA and DHA in our diets
- EPA and DHA omega-3s are associated with:
  - **heart** health
  - **brain** health (cognition and mental health)
  - **eye** health, and
  - **prenatal/maternal** health
- Eating fatty fish and taking an omega-3 supplement is a good strategy
- Aim for at least 500mg/day EPA+DHA omega-3s, or a "desirable" omega-3 index

Thank you

Elana Natker, MS, RD
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GOED

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