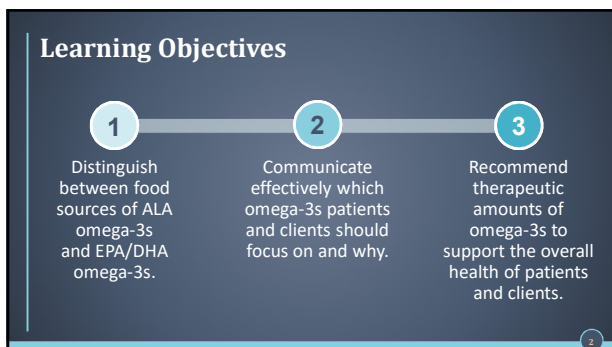


1








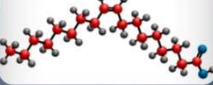
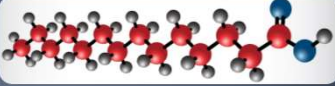
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3

Fats: A Review






- Saturated fats
- Unsaturated fats
 - Monounsaturated fats
 - Polyunsaturated fats
 - Omega-6
 - Omega-3



4

Omega-3 Fatty Acids

- Alpha-linolenic acid (ALA)
- Eicosapentaenoic acid (EPA)
- Docosahexaenoic acid (DHA)



5

Omega-3s: Are They Essential?

6

Essential? Yes, But...

- Essential = must come from diet; cannot be generated in the body
- Conversion rate ALA → EPA = low
- Conversion rate 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://pi.oregonstate.edu/lpi/other-nutrients/essential-fatty-acids>

7

Why You Need Omega-3s

8

Omega-3s and Heart Health

- Reduced risk of mortality from coronary heart disease or sudden cardiac death¹
- Lowers triglycerides²
- Improves blood vessel function³
- Lowers blood pressure⁴

1. http://www.nlm.nih.gov/evidence_chem/evidence_summary_jnl-2010311
2. Glick CD, Howe PR, Smith C, Press K, Benroushan A. Benefits of fish oil supplementation in hyperlipidemia: a systematic review and meta-analysis. *Int J Cardiol.* 2009;136:4-16.
3. Nestel P, Riggs H, Romney S, Cohen M, Abbey M, Reederstorff 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.
4. Miller PE, Van Elsland 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 Hypertens.* 2014;27:882-96.


9

A Study of Cardiovascular Events in Diabetes (ASCEND)

- 15,480 subjects with diabetes, but without evidence of CVD
- Treatment: 1 g/d omega-3 fatty acids (840 mg EPA+DHA) or placebo
- Primary outcome: first serious vascular event
- Secondary outcome: first serious vascular event or any arterial revascularization
- No significant differences between groups

However --

- 18% statistically significant reduction in risk of vascular death
 - O-3 Group: 196 (2.5%) vs placebo: 240 (3.1%)




Bowman L, Melham M, Wallendorf K, et al.; ASCEND Study Collaborative Group. Effects of n-3 Fatty Acid Supplements in Diabetes Mellitus. N Engl J Med. 2018; 379:1540-1550. <http://dx.doi.org/10.1056/NEJMoa1712190>

10

Reduction of Cardiovascular Events With EPA - Intervention Trial (REDUCE-IT)

- 8,171 men and women
- 4 g/d EPA (icosapent ethyl) combined with statin therapy vs. statin therapy alone
- Reduction of first occurrence of major adverse cardiovascular events (MACE): 25%




Bhatt DL, Steg PG, Miller M, et al.; REDUCE-IT Investigators. Cardiovascular Risk Reduction with Icosapent Ethyl for Hypertriglyceridemia. N Engl J Med. 2019; 380:11-22. <http://dx.doi.org/10.1056/NEJMoa1812742>

11

Vitamin D and Omega-3 Trial (VITAL)

- Large-scale randomized clinical trial, follow up after 5 years
- Nearly 26,000 subjects
- All relatively healthy, no known CVD or cancer
- 28% reduced risk for heart attacks among omega-3 supplement users (given 1 g/day)
- 17% reduced risk for CHD
- Rates more dramatic for those with less omega-3 intake at baseline




Manson JE, Cook NR, Lee IM, et al.; VITAL Research Group. Marine n-3 Fatty Acids and Prevention of Cardiovascular Disease and Cancer. N Engl J Med. 2019; 380:23-32. <http://dx.doi.org/10.1056/NEJMoa1802322>

12

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:
 - ADHD¹
 - Major depressive disorder (MDD)²
 - Bipolar disorder³
 - Schizophrenia⁴
- 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. McManara & Weige. *Bipolar Disord*. 2016;18(1):100-106.
 4. van der Kemp et al. *Schizophr Res*. 2012;140(2-3):153-161.
 5. Gupta et al. *Curr Rev Musculoskelet Med*. 2019;12(2):117-123.



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ISNPR Practice Guidelines on Omega-3s for MDD

According to the International Society for Nutritional Psychiatry Research (ISNPR):

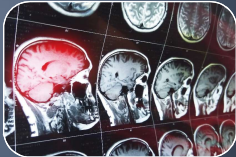
- n-3 PUFAs are better used as an **adjunctive treatment** than monotherapy for adult MDD (major depressive disorder)
- n-3 PUFAs can be efficacious and safe, both for acceleration and augmentation
 - **Acceleration:** adding n-3 at the beginning of treatment concurrently with another antidepressant
 - **Augmentation:** adding n-3 when a prior antidepressant's effect is inadequate
- Both pure EPA and EPA/DHA (ratio >2:1) combinations are **effective** as a potential treatment of MDD
- n-3 PUFAs are considered effective as an adjunctive treatment for acute major depressive episodes, but **more evidence is needed** for recurrent major depressive episodes

Gau et al. *Psychother Psychosom*. 2019;88:263-273.

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Omega-3 Protocol for TBI

- Use a concentrated triglyceride omega-3 product
- One dose of 3,000mg EPA+DHA: 3x/day for 1 week (9,000 mg/day)
- One dose 2x/day 1 more week (6,000 mg/day)
- One dose daily for ongoing maintenance




Brain Health Education and Research Institute. <http://www.brainhealtheducation.org/omega-3-protocol/>

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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



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Omega-3s and Prenatal Health

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



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American Academy of Pediatrics

... Long-chain polyunsaturated fatty acids, which include docosahexaenoic acid and arachidonic acid, are important for normal development of vision and may also affect neurocognitive development.

Advocacy for Improving Nutrition in the First 1000 Days to Support Childhood Development and Adult Health

Sarah Jane Schwarzenberg, Michael K. Georgieff and Committee on Nutrition *Pediatrics*, February 2018

Maternal prenatal nutrition and the child's nutrition in the first 2 years of life (1000 days) are crucial factors in a child's neurodevelopment and lifelong mental health, child and adult health risks, including obesity, hypertension, and diabetes, may be modifiable by nutritional status during this period. Calories are essential for fetus and child but are not sufficient for brain development. Although all nutrients are necessary for brain growth, key nu

Advocacy for Improving Nutrition in the First 1000 Days to Support Childhood Development and Adult Health. Sarah Jane Schwarzenberg, Michael K. Georgieff and COMMITTEE ON NUTRITION. *Pediatrics* February 2018, 141 (2) e20173716; DOI: <https://doi.org/10.1542/peds.2017-3716>

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Omega-3s and Preterm Birth/Low Birth Weight

- 42% reduced risk of early preterm birth (<34 wks)
- 11% reduced risk of preterm birth (<37 wks)
- 10% reduced risk of low birth weight (<5.5 lbs)

"Omega-3 LCPUFA supplementation during pregnancy is an effective strategy for reducing the incidence of preterm birth, although it probably increases the incidence of post-term pregnancies. More studies comparing omega-3 LCPUFA and placebo (to establish causality in relation to preterm birth) are not needed at this stage."

Omega-3 fatty acid addition during pregnancy
Phillippa Middleton, Judith C. Gomersall, Jacqueline F. Gould, Emily Shepherd, Sjurdur F. Olsen, Maria Makrides.
Intervention, November 15, 2018

Background: Higher intakes of foods containing omega-3 long-chain polyunsaturated fatty acids (LCPUFA), such as during pregnancy have been associated with longer gestations and improved perinatal outcomes. This is an update of a review that was first published in 2006.

Objectives: To assess the effects of omega-3 LCPUFA, as supplements or as diet additions, during pregnancy on neonatal outcomes and longer-term outcomes for mother and child.

Middleton P, Gomersall JC, Gould JF, Shepherd E, Olsen SF, Makrides M. Omega-3 fatty acid addition during pregnancy. Cochrane Database of Systematic Reviews 2018, Issue 11. Art. No.: CD009402. DOI: 10.1002/14651858.CD009402.pub3.

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Omega-3s: What You Need


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"Get More Omega-3s"

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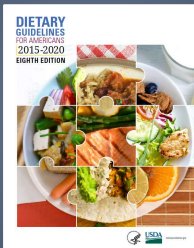
21

“Get More Omega-3s” → “Get More *EPA and DHA Omega-3s*”



22

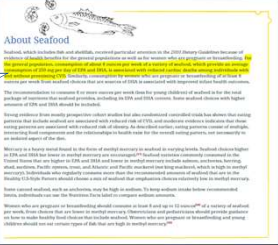
Omega-3 Intake Needs



23

Omega-3 Intake Needs

“...8 ounces per week of seafood, which provide an average consumption of 250 mg per day of EPA and DHA...”



U.S. Department of Health and Human Services and U.S. Department of Agriculture. 2015–2020 Dietary Guidelines for Americans. 8th Edition. December 2015. Available at <http://health.gov/dietaryguidelines/2015/guidelines/>.

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Omega-3 Intake Needs

Age	Male	Female	Pregnancy ²	Lactation ²
Birth to 6 months ¹	0.5 g	0.5 g	1.4 g	1.3 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

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. <http://ods.od.nih.gov/factsheets/Omega3FattyAcids-HealthProfessional/#en5>

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“Get More Omega-3s” → “Get More EPA and DHA Omega-3s”

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

	Adequate Intake (AI)	Actual Intake
Men (20+)	1.6 g	2.02 g
Females (20+)	1.1 g	1.66 g

U.S. Department of Agriculture, Agricultural Research Service. 2018. Nutrient Intakes from Food and Beverages: Mean Amounts Consumed per Individual, by Gender and Age, What We Eat in America, NHANES 2015-2016

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“Get More Omega-3s” → “Get More EPA and DHA Omega-3s”

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. 2018. Nutrient Intakes from Food and Beverages: Mean Amounts Consumed per Individual, by Gender and Age, What We Eat in America, NHANES 2015-2016

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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 11 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.

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Omega-3s and Preterm Birth/LBW: Omega-3 fats to Reduce the Incidence of Prematurity (ORIP Study)


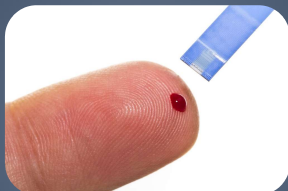
- Large, multicenter, double-blind, randomized trial of >5,000 women
- Trial group received 900mg omega-3 capsules; control group received vegetable oil capsules
- Starting from <20 weeks gestation to 34 weeks (or delivery)
- No measurable differences in early preterm birth or low birth weight between treatment and control groups.
- Post-study analysis of singleton pregnancies from the study
- Assessed omega-3 status from blood collected at 14 weeks gestation
- Low total omega-3 PUFA status in early pregnancy was associated with a higher risk of early preterm birth.
- Women with higher total omega-3 status in early pregnancy were at lower risk of early preterm birth.
- Tipping point for supplementation?

Makrides M et al. N Engl J Med 2019; 381:1035-1045. Simmonds LA et al. BJOG 2020; epub doi:10.1111/1471-0528.16168
Simmonds LA et al. BJOG 2020; epub doi:10.1111/1471-0528.16168

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Know Your Omega-3 Levels



Undesirable <4% Intermediate 4-8% Desirable 8-12%

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

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



≥ 250 mg daily average EPA+DHA

Must get two servings *each week*

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

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



> 250 mg daily average EPA+DHA

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




Best strategy for boosting levels of EPA+DHA

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Supplement Types



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Even for Vegetarians and Vegans




Algal Oil

Algae Farm image reprinted with permission.

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How to Read a Supplement Label



Supplement Facts

1 Serving Size: 2 Soft Gels

Amount Per Serving	% Daily Value
Calories from fat	18
Calories from fat	18
Total Fat	2.0g 3%
Saturated Fat	0.3g 1%
Trans Fat	0g **
Vitamin E (d-alpha tocopherol)	30 I.U. 100%

2 Omega-3s

	Weight***	Volume %
EPA (Eicosapentaenoic Acid)	120mg	35%
DHA (Docosahexaenoic Acid)	150mg	25%
Other Omega-3s	150mg	10%
Total Omega-3s	1280mg	35%
Cholic Acid (Omega-9)	50mg	3%

3

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

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Summary: Putting It Into Practice

- Americans are meeting recommendations for ALA omega-3s but **not** for EPA and DHA omega-3s
- EPA and DHA omega-3s are associated with **heart** health, **brain** health (cognition and mental health), **eye** health, and **prenatal/maternal** health
- To boost blood levels of EPA and DHA, seafood meals are good but **seafood + supplements are better**
- There's an EPA+DHA supplement for everybody, **including vegetarians/vegans**



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Questions?

Elana Natker, MS, RD

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@elanaRD

elana@connectwithsage.com



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Credit Claiming

You must complete a brief evaluation of the program in order to obtain your certificate. The evaluation will be available for 1 year; you do not have to complete it today.

CREDIT CLAIMING INSTRUCTIONS:

1. Login to www.CE.TodaysDietitian.com.
2. Click "My Courses" and select this webinar's title.
3. Click "Take Course" on the webinar description page.
4. Select "Start/Resume" to complete the course and submit the evaluation.
5. Download and print your certificate.

40

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