

Plant-Based Omega-3s in Focus: Insights and Innovations for Cardiometabolic Health

Wendy Bazilian, DrPH, MA, RDN



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**SEEDS OF
WELLNESS®**

by **Benexia**
Advanced Seed Nutrition

Nutrition in Chia Seeds

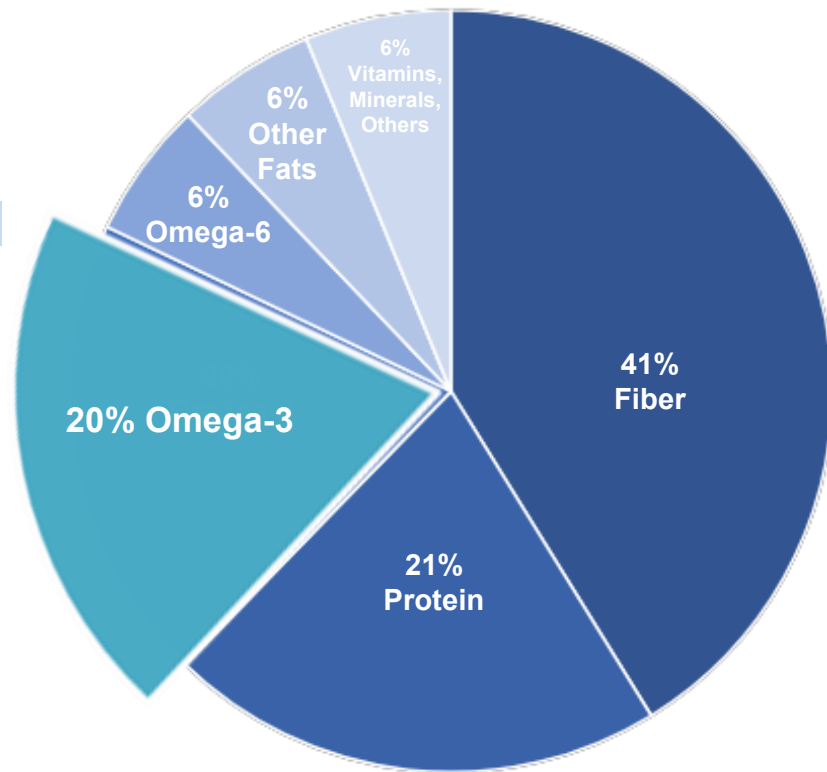
1 ounce (2 tbsp):

- 140 calories
- 9 g fat
 - **5 g ALA omega-3 fatty acids**
- 12 g carbohydrates
 - 10 g fiber*
- 5 g protein (PDCAAS 0.85)
 - 95 mg magnesium*
 - 244 mg phosphorus*
 - 179 mg calcium^
 - 2 mg iron^
 - 0.26 mg copper^
 - 0.77 mg manganese^
 - 15.6 µg selenium^

USDA, Food Data Central, 2023.

* Excellent source

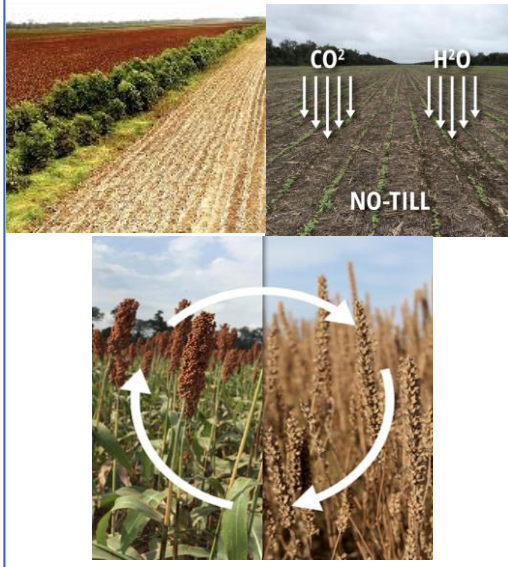
^ Good source



Chia Seed Nutritional Composition per 100g

Grow, Harvest, Process

REGENERATIVE AGRICULTURE



ECO-FRIENDLY HARVEST



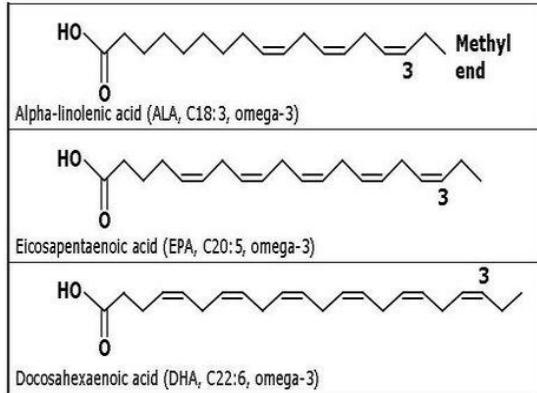
PRODUCTION / PROCESSING



- Cold press
- 100% Electrical
- Water-free
- No solvents, diluants

**Current Research:
Plant-based Omega-3
and Cardiometabolic Health**

Omega-3 Metabolism



ALA
Alpha-Linolenic Acid (C18:3)

Plant sources (chia, walnuts, flaxseed, canola oil)

Essential Fatty Acid
(The Parent)

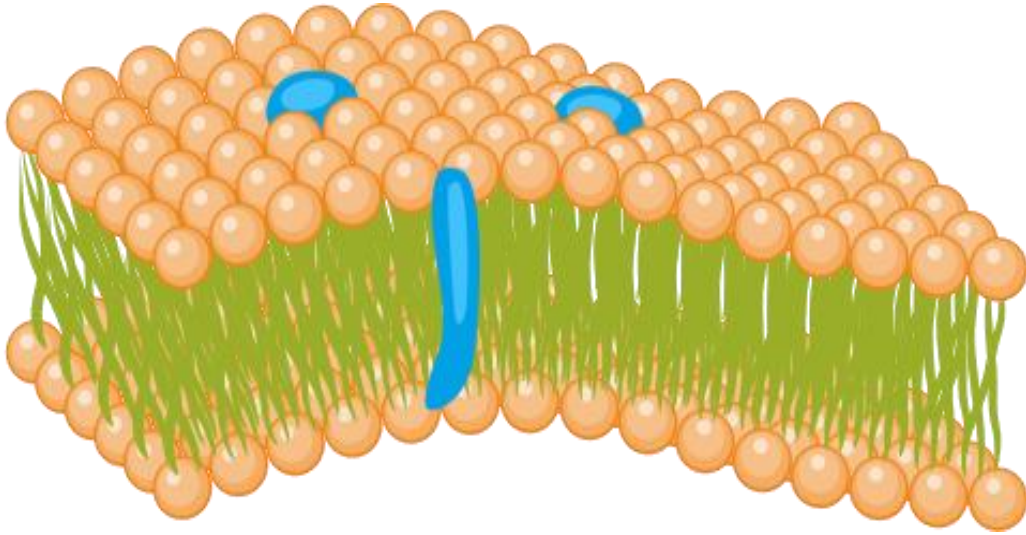
EPA
Eicosapentaenoic Acid (C20:5)

From ALA conversion +
Marine sources (fatty fish like salmon, sardines, mackerel, trout)

DHA
Docosahexaenoic Acid (C22:6)

From ALA conversion +
Marine sources (fatty fish like salmon, sardines, mackerel, trout; egg yolk, algal source)

ALA is Uniquely Essential



ADA 2025 Standards of Care in Diabetes: Recommendations for Omega-3 Intake

- **Increase dietary n-3 fatty acids**
 - For lipid management and reducing the risk of developing atherosclerotic cardiovascular disease (ASCVD) in people with diabetes
- **Emphasize elements of a Mediterranean eating pattern rich in unsaturated fats including long-chain fatty acids such as fatty fish, nuts, and seeds**
 - To reduce cardiovascular disease risk and improve glucose metabolism
 - Reduction of saturated and trans fat also recommended; replace saturated fats with unsaturated fats
- **No consensus on recommended daily dietary intake of omega-3 supplementation (EPA and DHA) for patients with diabetes**
 - Impact on glycemic management and cardiovascular health is inconclusive

Daily Recommendations and Actual Consumption

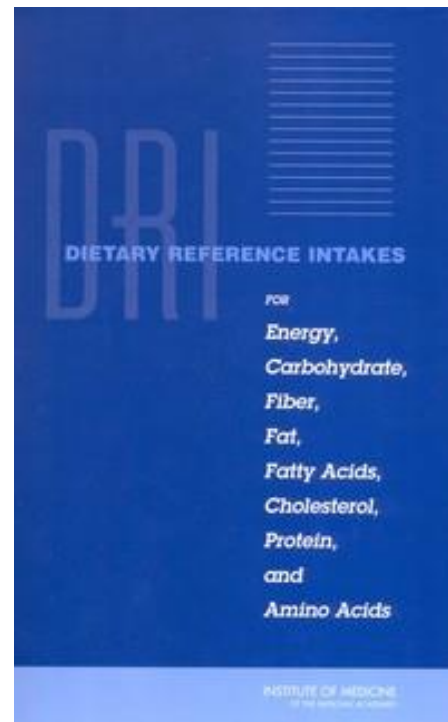
Recommendations

- ALA AI: 1.1 g and 1.6 g
 - 2-4g recommended for health promotion and disease risk reduction

Actual consumption

(males and females):

- ALA
 - 1.46 g, age 2-19
 - 1.95 g, > age 20



J Acad Nutr Diet. 2014;114(1):136-53. <https://pubmed.ncbi.nlm.nih.gov/24342605/>

WHO: https://www.who.int/nutrition/topics/FFA_summary_rec_conclusion.pdf?ua=1

U.S.D.A., ARS. 2020. Nutrient Intakes from Food and Beverages: Mean Amounts Consumed per Individual, by Gender and Age, What We Eat in America, NHANES 2017-2018. *Nutrients*. 2020;12(7):2045.

IOM: <https://nap.nationalacademies.org/read/10490/chapter/10#423>

IOM: <https://nap.nationalacademies.org/read/11537/chapter/12>

Dietary Sources of ALA: Not always nutrient-dense

Food	Contribution to daily intake of α -linolenic acid	
	Mean (95% CI), g	Percent
Mixed-grain dishes ²	0.22 (0.21, 0.23)	13
Salad dressing	0.22 (0.21, 0.23)	13
Mixed meat and seafood dishes ³	0.18 (0.17, 0.18)	11
Mixed potato dishes ⁴	0.11 (0.10, 0.12)	6
Sweet baked goods ⁵	0.11 (0.10, 0.11)	6
Mixed vegetable dishes ⁶	0.07 (0.07, 0.08)	4
Yeast breads	0.07 (0.07, 0.08)	4
Poultry	0.05 (0.05, 0.06)	3
Crackers and salty snacks	0.05 (0.05, 0.06)	3
Margarine and butter ⁷	0.05 (0.04, 0.05)	3
Total	1.67 (1.64, 1.71)	100



Omega-3 ALA + Heart Disease Risk and Mortality

Research over past decade shows:

- Swap saturated fats with PUFAs to decrease risk of CVD (1)
- ALA may be as effective in reducing risk of CVD as marine-derived EPA and DHA (2)
- Each 1 g increase ALA associated with 5% decreased risk of death from CVD (3)
- ALA intake associated with:
 - Lower risk of death—all causes, CVD and CHD (3,4,6)
 - Lower risk of CVD (6)
 - Lower CVD incidence in people with low intake of EPA and DHA (<250 mg/d) (5)

1. J Am Coll Cardiol. 2015;6(66):1538-1548.

2. Adv Nutr. 2014;5(6):863S-76S.

3. BMJ. 2021;375:n2213.

4. Front Nutr, 2021: 8:2296.

5. Euro J Clin Nutr. 2021;75:1483–1490.

6. Adv Nutr. 2022;13(5):1584-1602.

Omega-3 ALA + Blood Pressure, Lipids, Inflammation

2022 Comprehensive Review

Evaluated RCTs and observational studies on n-3 ALA and heart disease risk factors

Higher n-3 ALA fat in the diet associated with:

- Decreasing atherogenic lipids
- BP reduction
- Reduced markers of inflammation



REVIEW

Impact of α -Linolenic Acid, the Vegetable ω -3 Fatty Acid, on Cardiovascular Disease and Cognition

Aleix Sala-Vila,^{1,2} Jennifer Fleming,³ Penny Kris-Etherton,³ and Emilio Ros^{4,5}

¹Fatty Acid Research Institute, Sioux Falls, SD, USA; ²Cardiovascular Risk and Nutrition, Hospital del Mar Medical Research Institute (IMIM), Barcelona, Spain;

³Department of Nutritional Sciences, College of Health and Human Development, Pennsylvania State University, University Park, PA, USA; ⁴Lipid Clinic, Endocrinology and Nutrition Service, Hospital Clinic, August Pi i Sunyer Biomedical Research Institute (IDIBAPS), Barcelona, Spain; and ⁵CIBER Physiopathology of Obesity and Nutrition (CIBEROBN), Instituto de Salud Carlos III (ISCIII), Madrid, Spain

ABSTRACT

Given the evidence of the health benefits of plant-based diets and long-chain n-3 (ω -3) fatty acids, there is keen interest in better understanding the role of α -linolenic acid (ALA), a plant-derived n-3 fatty acid, on cardiometabolic diseases and cognition. There is increasing evidence for ALA largely based on its major food sources (i.e., walnuts and flaxseed); however, this lags behind our understanding of long-chain n-3 fatty acids. Meta-analyses of observational studies have shown that increasing dietary ALA is associated with a 10% lower risk of total cardiovascular disease and a 20% reduced risk of fatal coronary heart disease. Three randomized controlled trials (RCTs) [AlphaOmega trial, Prevención con Dieta Mediterránea (PREDIMED) trial, and Lyon Diet Heart Study] all showed benefits of diets high in ALA on cardiovascular-related outcomes, but the AlphaOmega trial, designed to specifically evaluate ALA effects, only showed a trend for benefit. RCTs have shown that dietary ALA reduced total cholesterol, LDL cholesterol, triglycerides, and blood pressure, and epidemiologic studies and some trials also have shown an anti-inflammatory effect of ALA, which collectively account for, in part, the cardiovascular benefits of ALA. A meta-analysis reported a trend toward diabetes risk reduction with both dietary and biomarker ALA. For metabolic syndrome and obesity, the evidence for ALA benefits is inconclusive. The role of ALA in cognition is in the early stages but shows promising evidence of counteracting cognitive impairment. Much has been learned about the health benefits of ALA and with additional research we will be better positioned to make strong evidence-based dietary recommendations for the reduction of many chronic diseases. *Adv Nutr* 2022;13:1584–1602.

Omega-3 ALA + T2D, MetS, Obesity

- **With respect to T2D, MetS, and obesity, the evidence is inconclusive for benefits of ALA (1)**
 - Using biomarker of ALA has shown mixed results
 - See beneficial associations with dietary ALA as biomarker
- **Another review found that ALA inversely associated with lower risk of T2D (2)**
 - No significant association with **CVD-related outcomes** (though they were seen for marine/fish omega-3s)
- **Cross-sectional study in older adults found women were significantly below the AMDR for ALA omega-3 vs. those without Met-S (3)**
 - Subjects with MetS were less likely to meet recommendations for fat and macronutrient intakes compared with non-MetS subjects

1. Adv Nutr. 2022;13(5):1584-1602.
2. Clin Nutr. 2022;41(8):1798-1807.
3. Nutrients. 2019; 11(8): 1901-1916.

Research on Whole Food Sources of Omega-3 ALA

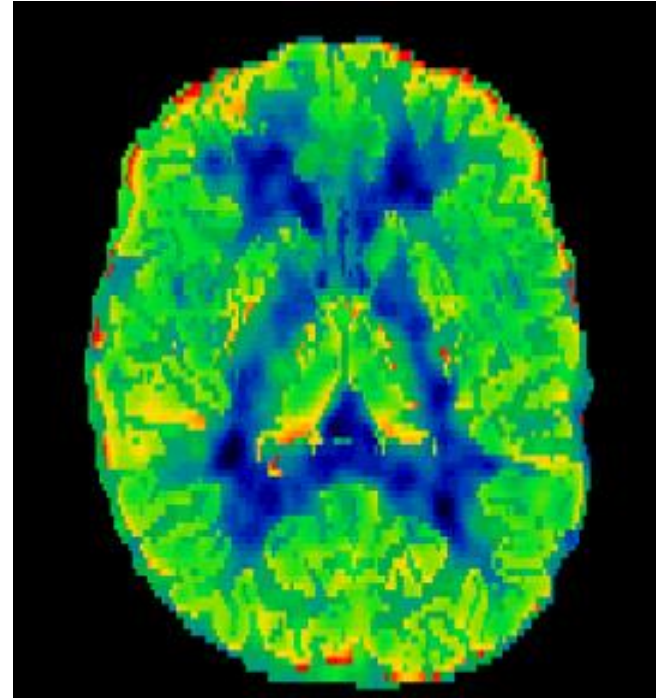


Flipping the Switch on What We Know About Omega-3 Metabolism

EPA and DHA can be synthesized from ALA but the conversion rate is low

....how do we quantify “low”?

....before we call something “low,” we should know: how much EPA and DHA is needed in different parts of the body?



Plant-based Omega-3 Product Innovations Featuring Chia

Chia Oil

- 3g omega ALA per teaspoon
- 63% of total fat is ALA
- 420°F, medium-high smoke point
- All-purpose culinary oil
 - Add to smoothies, whisk into salad dressings, and use when roasting, sauteing, and baking

Available on Amazon



Chia Mucil

- 0.4g (400 mg) omega-3 ALA
- 7g total carb
 - 4.5g fiber (soluble and insoluble)
 - 0g sugar
- 2g protein



*Available on Amazon
starting February 2025*

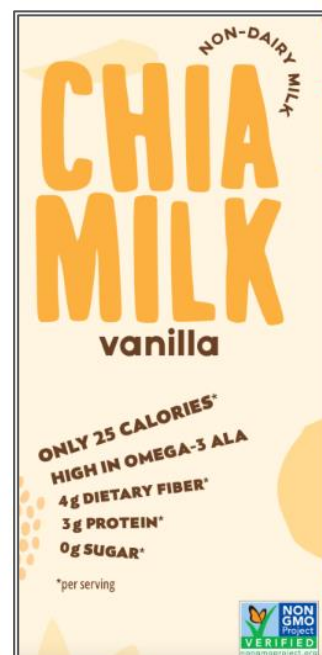
Chia Milk

- 0.74g (740mg) omega-3 ALA
- 4g total carb
 - 4g fiber
 - 0g sugar
- 3g protein

Available starting in January 2025 on Amazon and in select Costco stores



Nutrition Facts	
About 4 servings per container	
Serving size 1 cup (8 fl oz/240 mL)	
Amount per Serving	
Calories	25
	% Daily Value*
Total Fat 1.5g	2%
Saturated Fat 0.1g	1%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 50mg	2%
Total Carbohydrate 4g	1%
Dietary Fiber 4g	15%
Total Sugars 0g	
Includes 0g Added Sugars	0%
Protein 3g	
Potassium 85mg	2%
Calcium 130mg	10%
Iron 0.3mg	2%
Vitamin D 0.6mcg	3%
Vitamin A 108mcg	12%
Vitamin E 2.4mg	16%
Omega-3 Fatty Acid (alpha-linolenic acid) 740mg	
* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.	
INGREDIENTS: WATER, BENEXIA® CHIA PROTEIN, BENEXIA® CHIA OIL, LESS THAN 1% CHICORY ROOT FIBER, GELLAM GUM, CALCIUM CARBONATE, VITAMINS A, D AND E, SALT, NATURAL FLAVORS.	



Nutrition Facts	
About 4 servings per container	
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Amount per Serving	
Calories	25
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Saturated Fat 0.1g	1%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 50mg	2%
Total Carbohydrate 4g	1%
Dietary Fiber 4g	15%
Total Sugars 0g	
Includes 0g Added Sugars	0%
Protein 3g	
Potassium 85mg	2%
Calcium 130mg	10%
Iron 0.3mg	2%
Vitamin D 0.6mcg	3%
Vitamin A 108mcg	12%
Vitamin E 2.4mg	16%
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A close-up photograph of several lavender flower spikes. The flowers are small, purple, and arranged in dense clusters along green stems. The background is a soft, out-of-focus landscape with more greenery and a hint of a building under a bright sky.

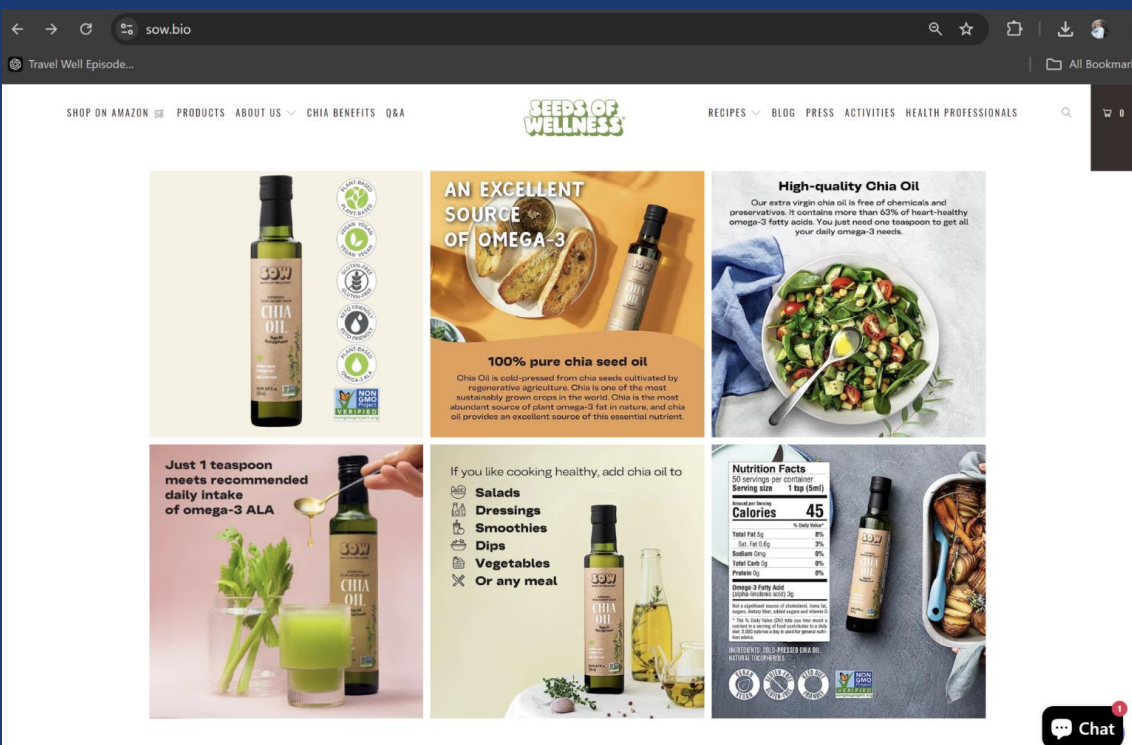
Thanks a Brazilian!

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