



Cardiovascular Disease and Diet: Hot Topics and Current Recommendations

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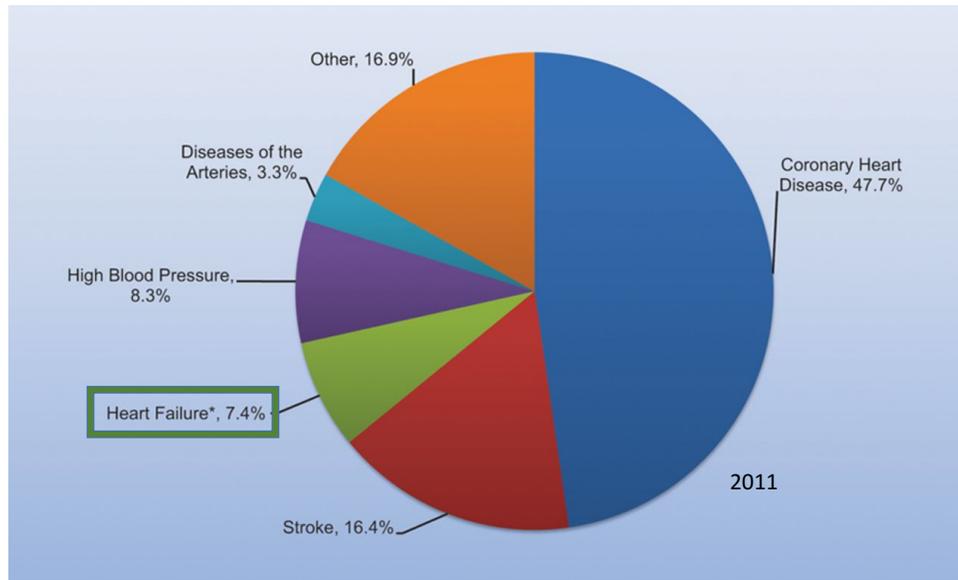
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CVD and Diet: Hot Topics and Current Recommendations

- I. Define CVD and identify a growing trend
- II. Review health metrics for cardiovascular health
- III. Evidence-based recommendations for diet and CVD prevention
- IV. Integrating knowledge into your practice

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I. What is Cardiovascular Disease?



Dariusz Mozaffarian et al. *Circulation*. 2015;131:e29-e322

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To Address Prevention of CVD: 7 Metrics of Ideal Cardiovascular Health Goals for 2020



Absence of Disease and

4 Health Behaviors

- ✓ Smoking
- ✓ Body Mass
- ✓ Physical Activity
- ✓ Healthy Diet Score

3 Health Factors

- ✓ Total Cholesterol
- ✓ Blood Pressure
- ✓ Fasting Plasma Glucose

Healthy Diet Score

- ≥ 4.5 serv. Fruits & Veggies /d
- ≥ 2 serv. fish /wk
- ≥ 3 serv. whole grains /d
- < 36 oz sugar beverages /wk
- 1500 mg sodium

• Poor = 0-1

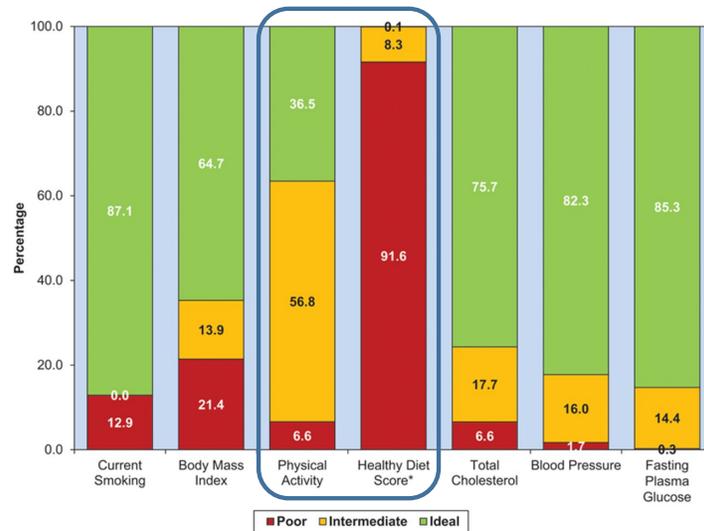
• Intermediate = 2-3

• Ideal = 4-5



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Prevalence for Cardiovascular Health Metrics US children (12 to 19 years)



NHANES 2011 to 2012

Dariusz Mozaffarian et al. Circulation. 2015;131:e29-e322

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III. Evidence Based Recommendations for Diet and CVD Prevention

A. Diet Patterns

- DASH
- Mediterranean Diets

B. Dietary Fats and Oils

- Saturated
- Trans
- PUFAs $\Omega 6$ & $\Omega 3$ PUFAs
- Monounsaturated fats

C. Current Recommendations

- Eggs
- Meat
- Fish
- Sodium

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AHA PRESIDENTIAL ADVISORY

Dietary Fats and Cardiovascular Disease

A Presidential Advisory From the American Heart Association

Circulation. 2017;135:00–00. DOI: 10.1161/CIR.0000000000000510

Sacks FM, et al.,

In summary, randomized controlled trials that lowered intake of saturated fat and replaced it with polyunsaturated vegetable oil reduced CVD events by $\approx 30\%$, similar to the reduction achieved by statin treatment.³¹ Adding

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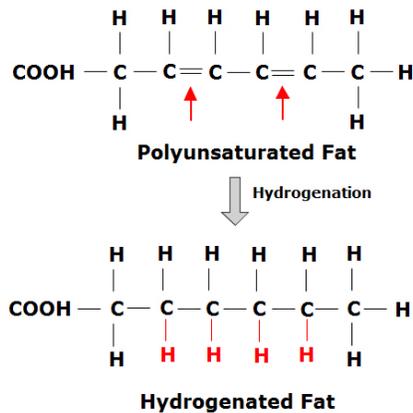
First dietary recommendation from AHA was about fats and oils

Not all fats in the diet have the same effect on the amount of cholesterol in the blood. Those high in polyunsaturated fatty acids have little effect, and those high in poly-unsaturated fats may cause a decrease. With vegetable oils this decrease is thought to be due largely to a poly-unsaturated fatty acid known as linoleic acid.

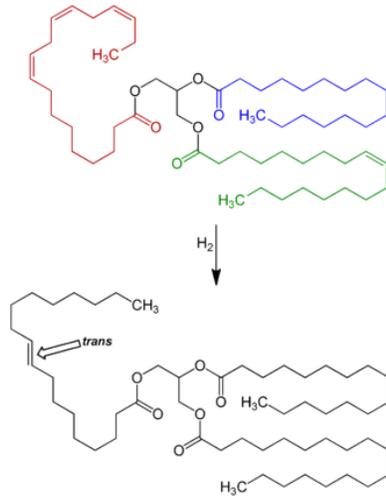
“With vegetable oils this decrease [of cholesterol] is thought to be largely due to a poly-unsaturated fatty acid known as linoleic acid.”

Page et al., Circulation 15: 97 (1957)

Hydrogenated Fats – solidifying fats



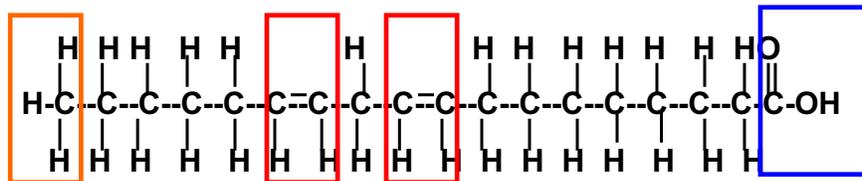
During Hydrogenation, some trans double bonds form



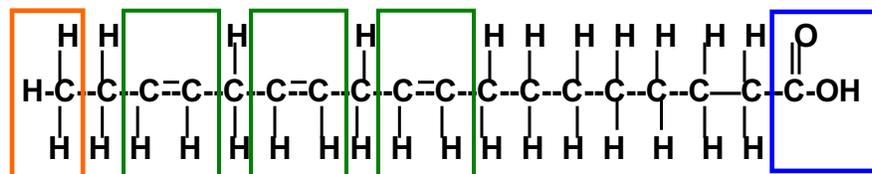
- Unintended
- The more double bonds that need to be removed, the more chances of trans by-products

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Two Essential Fatty Acids



Linoleic acid, 18:2 Ω 6

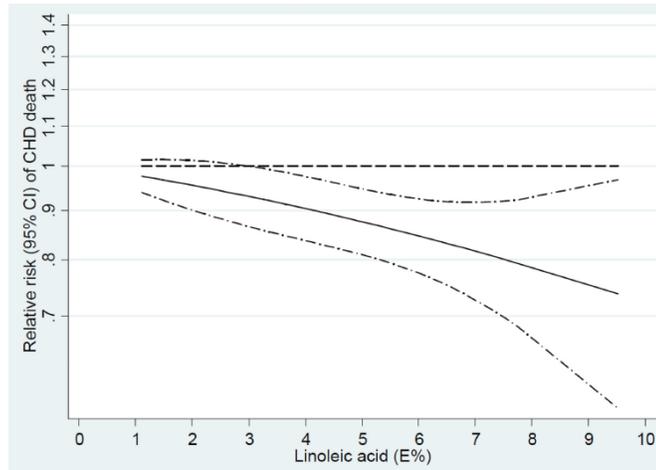


α -Linolenic acid, 18:3 Ω 3

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Dietary Linoleic Acid and Risk of Coronary Heart Disease: A Systematic Review and Meta-Analysis of Prospective Cohort Studies

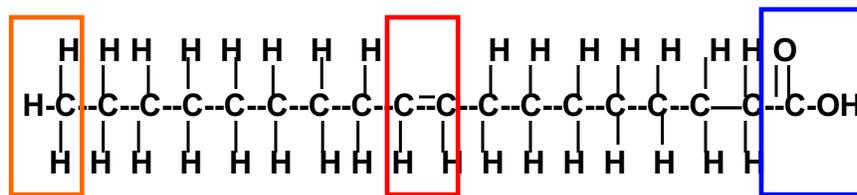
- Pooled analysis of 13 studies
- 310,602 individuals
- Higher dietary intake of LA foods → lower CVD risk (21% lower)



Farvid et al., Circulation 2014

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Monounsaturated fatty acid



Oleic acid (octadecaenoic acid)
 Omega 9 (Ω9) fatty acid
 Neutral role in CVD prevention

Sources in US

Dairy
 Meats, chicken, mixed dishes
 (NOT OLIVE oil)

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the Mediterranean diet

- Olive oil
- Fresh fruits and veggies
- Wine
- Nuts
- cheeses
- Fish and lean meats
- Grains
- Lean and physically active
- Sit a table and eat as social part of day

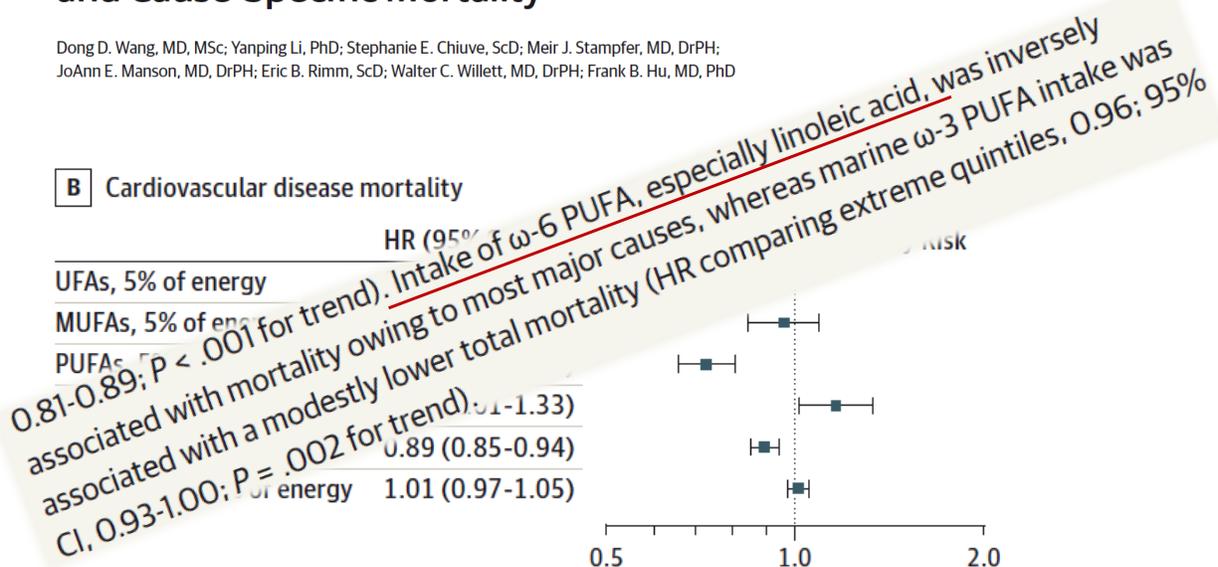
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Association of Specific Dietary Fats With Total and Cause-Specific Mortality

JAMA Intern Med 2016

Dong D. Wang, MD, MSc; Yanping Li, PhD; Stephanie E. Chiuve, ScD; Meir J. Stampfer, MD, DrPH; JoAnn E. Manson, MD, DrPH; Eric B. Rimm, ScD; Walter C. Willett, MD, DrPH; Frank B. Hu, MD, PhD

B Cardiovascular disease mortality



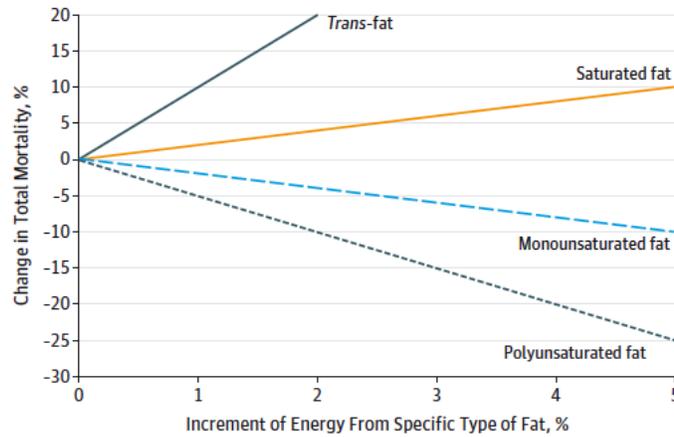
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JAMA Intern Med 2016

Figure 1. Change in Total Mortality Associated With Increases in the Percentage of Energy From Specific Types of Fat



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AHA Science Advisory

Omega-6 Fatty Acids and Risk for Cardiovascular Disease

A Science Advisory From the American Heart Association Nutrition Subcommittee of the Council on Nutrition, Physical Activity, and Metabolism; Council on Cardiovascular Nursing; and Council on Epidemiology and Prevention

William S. Harris, PhD, FAHA, Chair; Dariush Mozaffarian, MD, DrPH, FAHA;
Eric Rimm, ScD, FAHA; Penny Kris-Etherton, PhD, FAHA; Lawrence L. Rudel, PhD, FAHA;
Lawrence J. Appel, MD, MPH, FAHA; Marguerite M. Engler, PhD, FAHA;
Mary B. Engler, PhD, FAHA; Frank Sacks, MD, FAHA

Circulation 2009

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The Myth of the $\Omega 6/ \Omega 3$ Ratio

We do not get enough $\Omega 3$ PUFAs

Table 1. Five ways to lower an elevated omega-6/omega-3 fatty acid ratio

Omega-6 fatty acid	↓	→	↑	↓	↓↓
Omega-3 fatty acid	↑	↑	↑↑	→	↓

why divide “Good by Good”
- W.S. Harris

Harris WS. *Curr Atheroscl Rep* 2006; 8: 453-9

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Recommendations for fats and oils

- Go fish
- Be nutty
- Add avocados
- Read labels
- More poly



Order of Operations:

Poly >> Mono >> Saturated >>> Trans

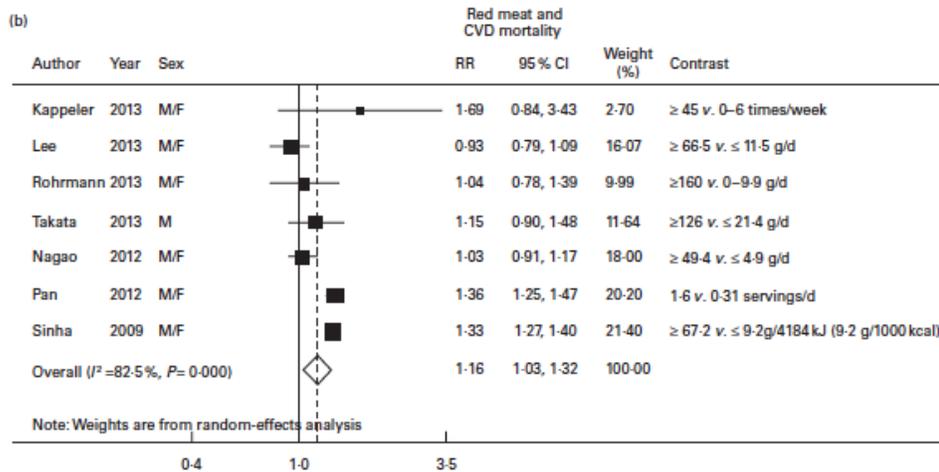
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Eggs

- Were restricted due to high cholesterol in yolk
- Now we know dietary cholesterol does not impact cholesterol levels in most people
- One per day OK for most days per week

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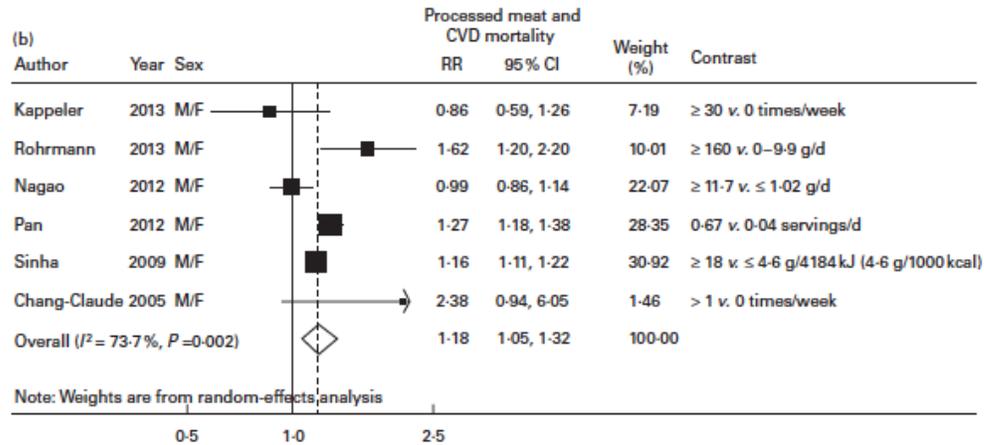
C. Other Foods - Red Meat



Abete et al., Brit J Nutr 2014

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Processed Red Meat and CVD



Abete et al., Brit J Nutr 2014

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C. Other Foods - Fish

If cold water, Rich on Long Chain $\Omega 3$ PUFAs

- Eicosapentaenoic acid ($20:5\Omega 3$)
- Docosahexaenoic acid ($22:6\Omega 3$)
- High Quality Protein
- 2 servings all fish / wk

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C. Other Foods - Sodium

- Over 70% of sodium consumption in US comes from processed foods not the salt shaker

'Salty Six'

1. Bread
2. Pizza
3. Sandwiches
4. Cured meats / cold cuts
5. Soup
6. Burritos and tacos

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IV. Integrating Knowledge into Your Practice

- A. Strength of the Evidence
 - AND Evidence Analysis Library
 - AHA Position Papers
- B. Know Your Audience
- C. Keep an eye on changes
 - AND Knowledge library & AHA Position Papers
 - Example: Vegetable oils

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B. Know Your Audience Polyunsaturated Fatty Acids and CVD Risk

Research and Practice Innovations

Knowledge of Dietary Fats among US Consumers

CHUNG-TUNG J. LIN, PhD; STEVEN T. YEN, PhD

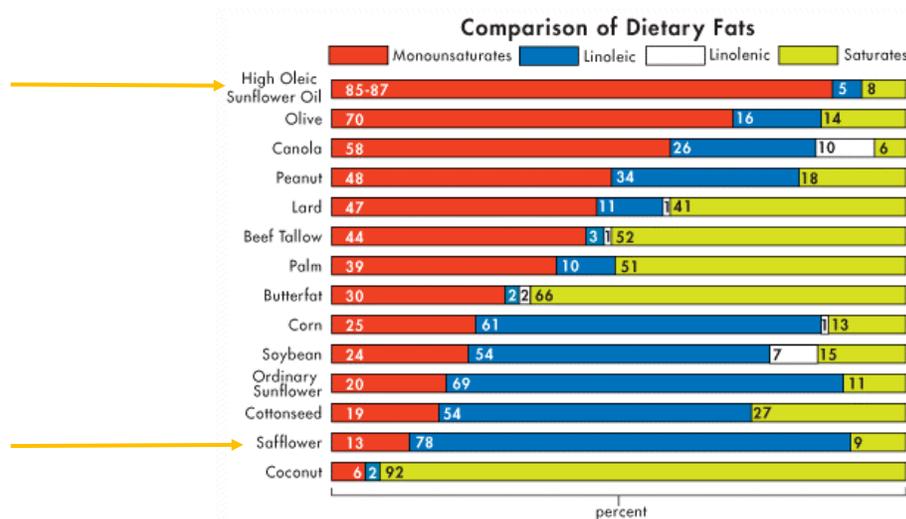
April 2010 Volume 110 Number 4

Table 1. Percent of US consumers who were aware of specific dietary fats and, among the aware, who reported various relationships between specific fats and the risk of heart disease (HD)

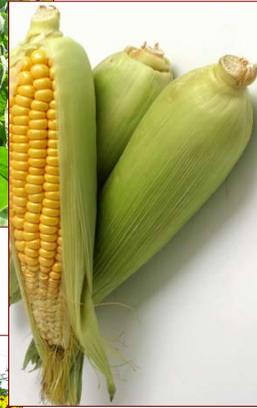
Consumer's belief	Saturated fat	Trans fat	Partially hydrogenated oil	n-3 fatty acids	Polyunsaturated fat	Monounsaturated fat
	← % of all consumers (n=1,798) →					
Have heard	95	67	68	61	77	62
	← % among those who have heard of a fat ^a →					
The fat raises risk of HD	78	48	39	6	21	16
The fat lowers risk of HD	1	5	6	51	15	16
The fat has no effect on risk of HD	1	4	5	4	7	9
Do not know or not sure	19	43	50	39	57	59
n	1,737	1,323	1,330	1,206	1,476	1,204

^aColumns do not necessarily sum to 100 due to rounding.

C. Keep an Eye on Changes --- Know Your Fats and Talk About Them



Old
Sources of
linoleic acid



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Changing the identity of vegetable oil

Nutrition Facts	
Serving Size 1 Tbsp (15mL)	
Servings Per Container about 63	
Amount Per Serving	
Calories 120	Cal. from fat 120
% Daily Value*	
Total Fat 14g	21%
Saturated Fat 1g	6%
<i>Trans</i> Fat 0g	
Polyunsaturated 11g	
Monounsaturated 2g	
Cholesterol 0mg	0%
Sodium 0mg	0%
Total Carbohydrate 0g	
Protein 0g	
Vitamin E 20%	

Nutrition Facts	
Serving Size 1 Tbsp (14g)	
Servings Per Container about 63	
Amount Per Serving	
Calories 120	Cal. from fat 120
% Daily Value*	
Total Fat 14g	21%
Saturated Fat 1g	6%
<i>Trans</i> Fat 0g	
Polyunsaturated 2g	
Monounsaturated 11g	
Cholesterol 0mg	0%
Sodium 0mg	0%
Total Carbohydrate 0g	
Protein 0g	
Vitamin E 20%	



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D. Keep it simple

**De-Clutter --- Consistent, Specific
& Measurable**

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Oils are typically:

- A. Liquid at room temperature
- B. Not required to be on food label
- C. Mostly unsaturated fatty acids
 - A. Monounsaturated
 - B. Polyunsaturated



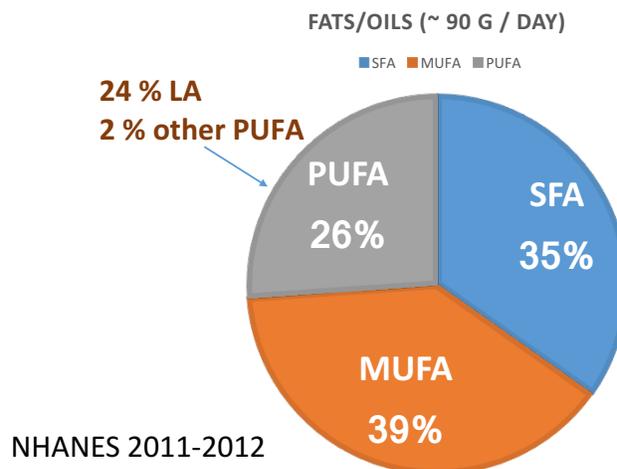
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Fats are typically:

- Solid at room temperature
- “hydrogenated” and Palm, coconut, saturated is required on label

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What Fats We Eat



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What Fats Do We Need? Dietary Reference Intakes (AI)*

Linoleic acid (18:2 Ω 6) (LA)

- **Adequate Intake (AI)**
= 12-11 g/d (females) 17-14 g/d (males)

α -linolenic acid (18:3 Ω 3) (α -LNA)

- **Adequate Intake (AI)** for
= 1.1 g/d (females) 1.6 g/d (males)

*There is no RDA set for essential fatty acids

National Academies of Sciences, Engineering and Medicine – Institute of Medicine

Belury

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Funding and Disclosures



OARDC



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