Cooking Oils, Inflammation, and Internet Nutrition Claims

Evidence-Based Answers About Seed Oils, Olive Oil, Butter, Lard, Tallow, and Coconut Oil

Lida Araghi, PhD - Assistant Professor and Extension Nutrition and Food Safety Specialist
Nina Roofe, PhD, RDN, LD - Assistant Vice President - Family & Consumer Sciences

Many cooking oils are available, but they differ in the types of fat they contain and their potential effects on health. Social media and other online sources often make conflicting claims about cooking oils, and not all those claims are supported by research. This fact sheet provides evidence-based information to help you make informed choices for yourself and your family.

Key message: Your body needs dietary fat, including both omega-3 and omega-6 fats. Choose cooking oils based on their fat composition, cooking use, budget, and your overall eating pattern. Common seed oils are not inherently toxic or inflammatory, and unsaturated oils can replace some fats higher in saturated fat.

DIVISION OF AGRICULTURE
RESEARCH & EXTENSION
University of Arkansas System

FAMILY & CONSUMER SCIENCES



Three messages to remember

- **Replace rather than simply add.** Substituting unsaturated oils for some higher-saturated-fat choices can support healthy cholesterol levels without adding unnecessary calories.
- **Choose the oil that fits the recipe, budget, and cooking method.** Olive, canola, corn, peanut, safflower, soybean, sunflower, and other non-tropical liquid plant oils are all options.
- **Look beyond the ingredient list.** A homemade meal cooked with soybean or canola oil is not nutritionally equivalent to chips, pastries, or fast food that also contain oil.

Why your body needs dietary fat

Dietary fat supplies energy, helps build cell membranes, supports brain and nerve function, and provides fatty acids the body needs but cannot make in sufficient amounts. Fat also helps the body absorb vitamins A, D, E, and K and plant pigments called carotenoids.

Fat provides 9 calories per gram, and a tablespoon of cooking oil contains about 120 calories. A modest amount of unsaturated oil on a salad or cooked vegetables can improve absorption of certain nutrients.

What happens to cooking oil after you eat it?

Most cooking oils contain triglycerides, which are fats made from fatty acids and glycerol. In the small intestine, bile helps break fat into tiny droplets, and digestive enzymes separate it into smaller components that the body can absorb. Those components are repackaged and transported through the body, where cells can use them for energy, storage, cell membrane composition, and normal signaling. The type and amount of fat in your overall eating pattern matter more than whether an oil came from a seed.

Your body needs both omega-3 and omega-6 fats

Two fatty acids must come from food: linoleic acid, an omega-6 fat, and alpha-linolenic acid, an omega-3 fat. Linoleic acid is found in soybean, corn, sunflower, and safflower oils, nuts, and seeds. Alpha-linolenic acid is found in flaxseed, chia seeds, walnuts, canola oil, and soybean oil. Both support normal body functions.

No single ideal omega-6-to-omega-3 ratio has been established for everyone. Focus on eating enough omega-3-rich foods instead of eliminating foods or oils that contain omega-6 fats.

Understanding the major types of fat

Type	What to know	Common sources	Practical message
Saturated fat	Often solid at room temperature; found in animal fats and some tropical oils.	Butter, coconut and palm oils, lard, tallow, shortening; also present in meat and dairy	Can raise low-density lipoprotein (LDL), or 'bad,' cholesterol. Replace some saturated fat with unsaturated fat.
Monounsaturated fat (MUFA)	An unsaturated fat found in many liquid plant oils and plant foods.	Olive, avocado, canola, and peanut oils; avocados, peanuts, and many nuts	Supports heart health when it replaces saturated fat.
Polyunsaturated fat (PUFA)	An unsaturated fat that includes the omega-6 and omega-3 families.	Soybean, corn, sunflower, safflower, and canola oils; walnuts, seeds, and fish	Includes omega-6 and omega-3 fats. Both families have important roles in health.
Omega-6 PUFA	Linoleic acid (LA) is the main dietary omega-6 fat and must come from food.	Soybean, corn, sunflower, safflower, sesame, and grapeseed oils; nuts and seeds	LA is essential. Human studies do not show that usual dietary amounts consistently increase common inflammatory markers.
Omega-3 PUFA	Includes alpha-linolenic acid (ALA), eicosapentaenoic acid (EPA), and docosahexaenoic acid (DHA).	Fatty fish and seafood; flax, chia, walnuts, canola and soybean oils	ALA is essential. The body converts only limited amounts into EPA and DHA, so include seafood or other direct sources when appropriate.

Not all omega-3 fats are the same

Alpha-linolenic acid (ALA) comes primarily from plant foods. Eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) occur mainly in fatty fish, such as salmon, sardines, and trout, and in certain algae-based products. The body converts limited amounts of plant-based alpha-linolenic acid (ALA) into the longer-chain forms, so plant and marine sources are not fully interchangeable.

The American Heart Association recommends two servings of fish per week, especially fatty fish, for people who eat seafood. For people who avoid fish, algae-based products may provide docosahexaenoic acid (DHA) and, in some cases, eicosapentaenoic acid (EPA). Discuss supplements with a health care professional, especially if you take blood-thinning medication.

Do seed oils cause inflammation?

Current evidence does not support the broad claim that seed oils or linoleic acid are inherently inflammatory. Omega-3 and omega-6 fats help the body produce signaling molecules involved in normal immune responses, healing, blood-vessel function, and blood clotting. Some of these signals contribute to inflammation, but controlled human studies do not show that typical dietary amounts of linoleic acid consistently increase common inflammatory markers.

Why the confusion? Seed oils are common ingredients in fried foods, packaged snacks, and desserts. Those foods may be high in calories, sodium, refined starches, or added sugars and low in fiber. Their overall nutritional profile—not the mere presence of a seed oil—is the more useful concern.

How fat affects cholesterol

Low-density lipoprotein (LDL), often called 'bad' cholesterol, can contribute to fatty buildup in artery walls. Replacing some saturated fat with monounsaturated or polyunsaturated fat can help lower low-density lipoprotein cholesterol.

Your personal cholesterol goals depend on your age, medical history, overall cardiovascular risk, and treatment plan.

Current recommendations

The 2025–2030 Dietary Guidelines for Americans advise limiting saturated fat to no more than 10% of total daily calories. The American Heart Association recommends a stricter limit — less than 6% of calories — for heart health and emphasizes replacing saturated fat with monounsaturated and polyunsaturated fats. For a 2,000-calorie eating pattern, these limits are 22 grams and 13 grams of saturated fat per day, respectively.

The federal guidance lists olive oil as an example of a preferred oil and permits options such as butter or beef tallow. Butter and tallow can fit occasionally, but the saturated fat they contribute still counts toward the daily limit.

What does recent research show?

Research consistently shows that replacing some saturated fat with unsaturated fat can improve blood cholesterol. Evidence on longer-term outcomes is more mixed: a 2025 review of randomized trials did not find clear reductions in overall or cardiovascular deaths from saturated-fat restriction, while a large 2025 observational study associated higher intake of certain plant oils with lower mortality and higher butter intake with higher mortality. Observational studies can identify associations, but they cannot prove that one oil or food caused the outcome.



Common claims: what the evidence supports

Claim: *"Seed oils are toxic."*
Evidence-based response: No. Common nontropical liquid plant oils are recognized as useful sources of unsaturated fat. Use reasonable amounts and avoid repeatedly reheating oil.

Claim: *"Omega-6 fats cause inflammation."*
Evidence-based response: Too broad. Linoleic acid is essential, and randomized trials do not show that it consistently raises common inflammatory markers.

Claim: *"Olive oil is healthy, so all seed oils must be unhealthy."*
Evidence-based response: False choice. Extra virgin olive oil is an excellent option, but canola, corn, peanut, safflower, soybean, and sunflower oils can also replace fats higher in saturated fat.

Claim: *"Coconut oil is natural, so it is healthier."*
Evidence-based response: Natural does not mean lower in saturated fat. Coconut oil is high in saturated fat and tends to raise LDL cholesterol more than nontropical liquid plant oils.

Claim: *"Lard and tallow are traditional, so they are better."*
Evidence-based response: Tradition and flavor are separate from heart-health effects. These fats contain more saturated fat than most nontropical liquid plant oils.

Claim: *"Extra virgin olive oil is a magic food."*
Evidence-based response: No single food is magic. Extra virgin olive oil provides monounsaturated fat and beneficial plant compounds. It works best within a Mediterranean-style eating pattern rich in vegetables, beans, whole grains, nuts, and fish.

Claim: *"I should avoid all fat to protect my heart."*
Evidence-based response: No. Your body needs dietary fat and essential fatty acids. Focus on reasonable portions, unsaturated fat sources, and your overall eating pattern.

Claim: *"Refined seed oils are toxic because they are processed."*
Evidence-based response: Processing alone does not make an oil toxic. Consider the final oil's fat composition, how it is used, and the nutritional quality of the whole meal.

Claim: *"I need a strict omega-6-to-omega-3 ratio."*
Evidence-based response: No universal ideal ratio has been established. Eat a variety of foods that provide both essential fats and include reliable omega-3 sources.



Choosing an oil for the job

Use	Examples	How to use
Everyday cooking	Olive, canola, corn, peanut, soybean, safflower, sunflower, or vegetable-oil blends	Use for sautéing, baking, roasting, marinades, and dressings. Choose based on flavor, price, and the label's cooking directions.
Flavor-forward dishes	Extra virgin olive, toasted sesame, walnut, or other specialty oils	Use where their distinctive flavor adds value. Specialty oils may cost more and may have specific storage needs.
Cold use or finishing	Extra virgin olive, flaxseed, walnut, or toasted sesame oil	Flaxseed oil is best used without high heat. Follow the package directions.
For occasional flavor	Butter, coconut oil, lard, tallow, ghee	Use smaller amounts rather than making these the primary household fats, especially when reducing LDL cholesterol is a goal.

What does 'high-oleic' mean?

Oleic acid is a monounsaturated omega-9 fat naturally present in olive oil, canola oil, and certain nuts. Products labeled high-oleic sunflower, safflower, or soybean oil contain more oleic acid than their conventional counterparts. These oils can provide a practical source of unsaturated fat, and their composition may improve stability during cooking.

The Food and Drug Administration permits a qualified heart-health claim for eligible oils containing at least 70% oleic acid when they replace fats higher in saturated fat without adding calories. A qualified claim means the evidence is supportive but not conclusive.

Does processing make a cooking oil unhealthy?

Oils may be pressed, extracted, filtered, or refined to improve flavor, appearance, shelf life, or cooking performance. These steps alone do not establish that an oil is harmful. A refined cooking oil used to prepare vegetables at home is not the same as a steady diet of heavily fried foods or packaged snacks. Evaluate the oil's fat composition, how often it is heated or reused, and the overall meal.



Put the oil in context

The healthiest message is not to fear a single ingredient. Build meals around vegetables, fruits, beans and other legumes, whole grains, nuts, seeds, and fish or other nutrient-dense protein foods. Use unsaturated oils to prepare these foods and limit frequent intake of fried foods and highly processed snack foods.

Key takeaway: Your body needs fat, including both omega-3 and omega-6 fats. Choose mostly unsaturated oils that fit your recipe and budget. Use these oils in place of fats higher in saturated fat, rather than adding extra fat. Use reasonable portions and focus on the quality of the whole meal.

Shopping, cooking, and storage tips

- **Compare labels.** A practical heart-health screen is less than 4 grams of saturated fat per tablespoon and no trans fat.
- **Use the amount the recipe needs.** All oils are calorie-dense, providing about 120 calories per tablespoon.
- **Do not heat oil until it smokes.** Smoking signals that the oil is degrading.
- **Do not save used frying oil for repeated use.** Deep-fat frying is not recommended as an everyday cooking method.
- **Store oil tightly closed in a cool, dark place.** Buy smaller containers if you use oil slowly, and discard oil that smells or tastes rancid.
- **Pair vegetables with a modest amount of oil.** This adds flavor and helps the body absorb certain fat-soluble nutrients.

Frequently asked questions

Q: ***Should I throw away my seed oils?***
Evidence-based answer: No. Use oils in reasonable amounts, store them properly, and focus on reducing fried and highly processed foods—not on fearing common cooking oils.

Q: ***Which oil is best?***
Evidence-based answer: There is no single best oil for every recipe. Olive, canola, corn, peanut, safflower, soybean, and sunflower oils are all lower-saturated-fat choices. Select one that fits the cooking method, flavor, budget, and availability.

Q: ***How can I improve my omega-3 intake?***
Evidence-based answer: Include fatty fish or seafood when appropriate and add plant sources such as flaxseed, chia, walnuts, canola oil, and soybean oil. Plant-based ALA is beneficial, but the body converts only limited amounts into EPA and DHA.

Q: ***Is coconut oil the same as medium-chain triglyceride oil?***
Evidence-based answer: No. Coconut oil and purified medium-chain triglyceride oil are different products. Coconut oil is high in saturated fat and can raise low-density lipoprotein cholesterol.

Q: ***Do I need a fish-oil supplement?***
Evidence-based answer: Not necessarily. Food sources are the first choice for most people. Discuss supplements with a health care professional, especially if you take a blood thinner or are considering a high-dose product.

Q: ***Do I need a specific omega-6-to-omega-3 ratio?***
Evidence-based answer: No universal ideal ratio has been established. Include both types of essential fat, and add omega-3-rich foods such as fatty fish, flaxseed, chia, walnuts, or appropriate algae-based products.

Q: ***Are partially hydrogenated oils still in U.S. foods?***
Evidence-based answer: The Food and Drug Administration completed actions to remove partially hydrogenated oils from the U.S. food supply. Continue to compare Nutrition Facts labels for saturated fat and trans fat.



References

1. U.S. Department of Health and Human Services and U.S. Department of Agriculture. Dietary Guidelines for Americans, 2025–2030. https://cdn.realfood.gov/DGA.pdf
2. American Heart Association. Fats in Foods. https://www.heart.org/en/healthy-living/healthy-eating/eat-smart/fats/fats-in-foods
3. American Heart Association. Healthy Cooking Oils. https://www.heart.org/en/healthy-living/healthy-eating/eat-smart/fats/healthy-cooking-oils
4. American Heart Association. Fish and Omega-3 Fatty Acids. https://www.heart.org/en/healthy-living/healthy-eating/eat-smart/fats/fish-and-omega-3-fatty-acids
5. National Institutes of Health, Office of Dietary Supplements. Omega-3 Fatty Acids: Fact Sheet for Health Professionals. https://ods.od.nih.gov/factsheets/Omega3FattyAcids-HealthProfessional/
6. National Institute of Diabetes and Digestive and Kidney Diseases. Your Digestive System & How It Works. https://www.niddk.nih.gov/health-information/digestive-diseases/digestive-system-how-it-works
7. White WS, Zhou Y, Crane A, Dixon P, Quadt F, Flendrig LM. Modeling the dose effects of soybean oil in salad dressing on carotenoid and fat-soluble vitamin bioavailability in salad vegetables. American Journal of Clinical Nutrition. 2017;106(4):1041–1051. doi:10.3945/ajcn.117.153635.
8. U.S. Food and Drug Administration. FDA Completes Review of Qualified Health Claim Petition for Oleic Acid and the Risk of Coronary Heart Disease. https://www.fda.gov/food/hfp-constituent-updates/fda-completes-review-qualified-health-claim-petition-oleic-acid-and-risk-coronary-heart-disease
9. U.S. Food and Drug Administration. FDA Completes Final Administrative Actions on Partially Hydrogenated Oils in Foods. https://www.fda.gov/food/hfp-constituent-updates/fda-completes-final-administrative-actions-partially-hydrogenated-oils-foods
10. Innes JK, Calder PC. Omega-6 fatty acids and inflammation. Prostaglandins, Leukotrienes and Essential Fatty Acids. 2018;132:41–48. https://pubmed.ncbi.nlm.nih.gov/29610056/
11. Johnson GH, Fritsche K. Effect of dietary linoleic acid on markers of inflammation in healthy persons: a systematic review of randomized controlled trials. Journal of the Academy of Nutrition and Dietetics. 2012;112(7):1029–1041.e15. doi:10.1016/j.jand.2012.03.029.
12. Nagra M, Goldman DM, Belury MA, Messina M. Concerns about the health effects of industrially produced seed oils are without scientific foundation: a scoping narrative review of the clinical and observational evidence. Critical Reviews in Food Science and Nutrition. 2026. doi:10.1080/10408398.2026.2657527.
13. Zhang Y, et al. Butter and plant-based oils intake and mortality. JAMA Internal Medicine. 2025;185(5):549–560. doi:10.1001/jamainternmed.2025.0205.
14. Yamada S, et al. Saturated fat restriction for cardiovascular disease prevention: a systematic review and meta-analysis of randomized controlled trials. JMA Journal. 2025. https://pubmed.ncbi.nlm.nih.gov/40416032/
15. Sacks FM, Lichtenstein AH, Wu JHY, et al. Dietary fats and cardiovascular disease: a presidential advisory from the American Heart Association. Circulation. 2017;136:e1–e23. doi:10.1161/CIR.0000000000000510.
16. Estruch R, Ros E, Salas-Salvadó J, et al. Primary prevention of cardiovascular disease with a Mediterranean diet supplemented with extra-virgin olive oil or nuts. New England Journal of Medicine. 2018;378:e34. doi:10.1056/NEJMoa1800389.

DIVISION OF AGRICULTURE
RESEARCH & EXTENSION
University of Arkansas System

Pursuant to 7 CFR § 15.3, the University of Arkansas Division of Agriculture offers all its Extension and Research programs and services (including employment) without regard to race, color, sex, national origin, religion, age, disability, marital or veteran status, genetic information, sexual preference, pregnancy or any other legally protected status, and is an equal opportunity institution.

FSFCS247-PD-10-2026