

Seed Oils: Health Hero or Hidden Hazard?

What is all the fuss about seed oils? The ongoing debate over the health effects of seed oils is muddled with misinformation, with many critics wrongly portraying these oils as harmful and contributing to chronic diseases. The reality is that seed oils, such as canola, sunflower, soybean, and corn oil, are a vital source of unsaturated fats, which are essential for maintaining heart health, reducing inflammation, and supporting overall wellness. It is crucial to address the misinformation surrounding seed oils, especially when posed by people in positions of power, and emphasize the scientifically-backed benefits they offer.

The Health Benefits of Seed Oils

Omega-6s and omega-3s are essential fatty acids, meaning we must obtain them from our diet.

Omega-6 linoleic fatty acids are commonly found in safflower oil, sunflower oil, sunflower seeds, and pumpkin seeds, while omega-3s are found in fatty fish, flaxseeds, and chia seeds.¹

They are both found in walnuts, and other select foods.¹ Omega-3 alpha linolenic acids are often heroized as a heart-healthy fat with numerous benefits for overall well-being.

Seed oils contain more than just fatty acids; they are also a source of vital micronutrients, including phytosterols, tocopherols, and carotenoids, which have been shown to offer antioxidant benefits.² Studies indicate that diets rich in these oils might lower the risk of chronic disease, reduce inflammation, and improve blood lipid profiles.³⁻⁶ The American Heart Association even recommends the inclusion of omega-6 linoleic fatty acids as part of a healthy diet to prevent cardiovascular disease. They, along with other esteemed nutrition scientists, promote the substitution of vegetable oils high in mono- and polyunsaturated fatty acids for saturated fatty

acids that you would find in animal fats and dairy products to help regulate the blood lipid profile.^{2,7}

Does Dosage and Type Matter?

The American Heart Association recommends getting 5-10% of daily calories from omega-6 fatty acids.¹ In a 2000 calorie per day diet, that would be around 100-200 calories per day, about 11-22 grams. A tablespoon of safflower oil in salad dressing provides 9 grams of omega-6 fats, while an ounce of sunflower seeds contains 9 grams, and an ounce of walnuts offers 11 grams.¹ The American population consumes, on average, 10 times more omega-6 linoleic acid than omega-3 alpha linolenic acid.¹ No matter what type of seed oil (omega-6) is consumed, it is important to balance it by comparably consuming omega-3 alpha linolenic acid, rather than decreasing omega-6 linoleic acid intake.¹ See appendix 1, table 1 for specific omega-6 linoleic acid and omega-3 alpha linolenic acid contents within different commercially available edible oils.

The Urgency of Addressing Misinformation:

Robert F. Kennedy Jr. (RFK Jr.) has gained attention for his outspoken stance on health and wellness, particularly concerning seed oils, which he claims are detrimental to human health.⁸ Yet, unlike leading experts in nutrition and health, RFK Jr. lacks formal health education or professional experience in nutrition science. His arguments center around the idea that industrial seed oils—such as canola, soybean, and sunflower oil—are driving an array of health problems, including inflammation, obesity, and heart disease. This notion came from our knowledge that omega-6 linoleic acid is a precursor for another fatty acid called arachidonic acid, which is an

early driver of an inflammatory pathway.¹ What many fail to acknowledge, however, is that arachidonic acid is also converted into molecules that calm inflammation and fight blood clots.¹ Additionally, the body converts only a small amount of omega-6 linoleic acid into arachidonic acid, even when omega-6 linoleic acid intake is high.¹

On Oct. 21, Kennedy took to Instagram to claim that “seed oils are one of the driving causes of the obesity epidemic,” correlating the rise of obesity with the fast-food industry’s switch from beef tallow to seed oils in fryers, particularly at McDonald’s, which he notes transitioned away from beef tallow in the 1990s.⁹ RFK Jr. advocates for a return to traditional fats like butter, tallow, and other animal fats, asserting that processed foods and seed oils are central to the modern health crisis.¹⁰ His claims underscore the broader issue of misinformation in the realm of nutrition, where compelling narratives can overshadow scientific evidence. As we approach the new 2025 administration, it is vital to recognize the influence of such claims on public opinion. Misinformation about food, particularly seed oils, has far-reaching consequences for public health policy and the food industry, and RFK Jr.’s platform risks perpetuating skepticism toward science—a hallmark of other sectors of his platform.

Why Do Some Health Professionals Demonize Seed Oils?

The Sydney Diet Heart Study (1966-1973) sheds light on the nuanced relationship between dietary fat sources and health outcomes, specifically evaluating the cardiovascular effects of replacing saturated fatty acids with omega-6 linoleic acid from safflower oil.¹¹ The Sydney Diet Heart Study reported increased all-cause mortality in the safflower oil group, but it did not provide group-specific data on cardiovascular or coronary heart disease deaths—key outcomes

often prioritized when evaluating dietary guidelines and evidence for cardiovascular health. Early interpretations of this study raised concerns about the potential risks of omega-6 linoleic fats due to their susceptibility to oxidation, however, more recent insights suggest that these oils, when consumed as part of a balanced diet, can provide significant health benefits that outweigh these risks.¹¹

Dr. Joseph Hibbeln, formerly acting chief of the section on Nutritional NeuroSciences at the National Institutes of Health, discussed how omega-6 fatty acids, like those found in safflower oil, are prone to oxidation, leading to the production of bioactive molecules that may promote inflammation.¹² Omega-6 fats, like linoleic acid, can break down through a process called lipid peroxidation, where reactive molecules cause damage to these fats.¹³ This breakdown creates harmful substances like hydroxynonenal (HNE), which is linked to cell damage and diseases related to oxidative stress and inflammation.¹³ For example, cooking with oils rich in omega-6 fats, such as soybean, canola, and sunflower oil, at high temperatures (like deep-frying) increases the production of HNE, which is absorbed into the body when consumed.¹³

It is crucial to contextualize these findings. Oxidative stress and HNE accumulation are not inherent to omega-6 fatty acids themselves but are strongly influenced by external factors, such as the method of oil preparation (e.g., repeated heating) and lifestyle factors like smoking and heavy alcohol use. Problems usually arise only under extreme conditions, such as severe oxidative stress caused by these risk factors, where high levels of HNE can damage cells and contribute to disease.¹³ In individuals without these risk factors, the cholesterol-lowering and cardiovascular benefits of omega-6 linoleic fats are more likely to dominate. Although omega-6

fats can break down into reactive substances like hydroxynonenal (HNE), research does not show that omega-6 fats are harmful on their own. In fact, at low levels, HNE helps maintain healthy cells and regulate proteins.¹³

Thus, although concerns about oxidation and lipid peroxidation warrant attention, they do not diminish the substantial evidence supporting the role of omega-6 linoleic fats in improving heart health and lowering LDL cholesterol. Dr. Hibbeln's observations provide valuable insights into the biochemical mechanisms at play, but they should be viewed alongside epidemiological findings showing the overall benefits of omega-6 fats in the context of a balanced diet. Further research is needed to better understand the long-term health implications of HNE and oxidative stress, particularly in real-world dietary contexts.

Unveiling Evidence: Seed Oils, Omega 6 and Omega 3, and Human Health

Dr. Dariush Mozaffarian, a leading cardiologist and head of the *Food is Medicine* Institute at Tufts University, offers a robust scientific counterpoint to unscientific claims about seed oils that is grounded in evidence from human trials and decades of nutrition science. Dr. Christopher Gardner, a professor of medicine and nutrition science at Stanford University, reinforces these arguments with additional evidence on the essential role of seed oils in a healthy diet.

One significant flaw in the anti-seed oil narrative is rooted in early studies conducted on rats, where lowering omega-6 and raising omega-3 intake appeared to yield positive health outcomes. However, as Mozaffarian explains, findings from these animal studies do not translate to human physiology. In humans, omega-6 linoleic fatty acids do not exhibit the pro-inflammatory effects

often attributed to them. Mozaffarian asserts, “There has never been a human trial that shows that linoleic acid is pro-inflammatory or causes harm.” His extensive research indicates that increasing intake of polyunsaturated fatty acids (PUFAs) like omega-6s found in seed oils leads to improved metabolic health and a reduced risk of chronic diseases, particularly cardiovascular disease (CVD).

Gardner further underscores the benefits of omega-6 fatty acids, where they play a vital role in lowering LDL (“bad”) cholesterol and reducing the risk of heart disease and stroke.¹⁴ While omega-3 fatty acids may provide greater cardiovascular benefits, Gardner clarifies that omega-6 fats are not harmful—“It’s just that omega-3s are better.”¹⁴ Concerns over omega-6 being pro-inflammatory are also overblown, as the levels of inflammation they might cause have not been shown to have adverse health effects in humans.¹⁴

Mozaffarian also addresses the common argument about the omega-6 to omega-3 ratio, which often centers on the idea that an “imbalance” between these fatty acids can cause health issues. This, he argues, is a misconception. The health impacts attributed to the omega-6 to omega-3 ratio are driven primarily by omega-3 intake, not by reducing omega-6. Given the high variability in human consumption of omega-3s across different diets, the ratio itself becomes a misleading metric. Instead, Harvard Medical School advocates for the focus to be on ensuring adequate omega-3 intake while recognizing that omega-6, which can be obtained through seed oils, is beneficial and not inherently inflammatory or harmful.¹

Critics of seed oils often raise concerns about their use in processed and fried foods, particularly due to the formation of harmful lipid oxidation products (LOPs) when oils are excessively reheated.¹⁵ However, Gardner emphasizes that these issues are not inherent to seed oils but stem from improper handling and preparation methods. Gardner notes that seed oils used to enhance healthy meals—such as stir-frying vegetables with sesame oil or dressing a salad with sunflower oil—provide substantial health benefits while improving the flavor and palatability of nutritious foods. He adds, “The seed oils are not killing you. They are helping you enjoy more healthy foods.”¹⁴

Mozaffarian and Gardner, along with other esteemed nutrition scientists, call for a more nuanced discussion based on the available evidence, acknowledging that seed oils are not the villain they are often made out to be. Mozaffarian states unequivocally, “Among all of the nutritional controversies out there, [this is] one of the most loudly and consistently declared with not only no evidence, but overwhelming evidence on the other side.” Together, Mozaffarian and Gardner challenge leaders like RFK Jr. who are stuck in a muddled unsophisticated viewpoint, often lacking context, scientific integrity and driven by stubbornness and undue influence. Mozaffarian and Gardner highlight the overwhelming scientific consensus that should drown out RFK Jr.’s misinformation: seed oils, when consumed as part of a balanced diet, are not only safe but are essential contributors to improved cardiovascular and overall health.

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Appendix 1: Omega-6 linoleic acid and omega-3 alpha linolenic acid contents in commercially available edible oils

Table 1| Content of n-6 LA and n-3 α LNA in commercially available edible oils

Cooking oil	LA (g per 100 g of cooking oil)	α LNA (g per 100 g of cooking oil)
Vegetable oil*	Depends on specific oil	Depends on specific oil
Safflower†	74.6	0.0
Sunflower†	65.7	0.0
Cottonseed	51.5	0.0
Corn	53.5	0.2
Soybean	50.3	7.0
Canola	18.6	9.1
Olive	9.8	0.8
Butter oil	2.3	1.4
Coconut	1.8	0.0

n-6 LA=omega 6 linoleic acid; n-3 α LNA=omega 3 α linolenic acid. Fatty acid contents of oils vary to some extent by season, latitude, and other conditions. USDA National Nutrient Database numbers: safflower 04510, sunflower 04510, cottonseed 04502, corn 04518, soybean 04669, canola 04582, olive 04053, butter 01003, coconut 04047.⁹

*Food items labeled "vegetable oil" may contain one or more of the above oils.

†Varieties of safflower and sunflower oils with lower LA content are commercially available.