

Unpacking the Science of Seed Oils

LEADING NUTRITION EXPERTS ANSWER KEY QUESTIONS, INCLUDING THE HEALTH BENEFITS OF LINOLEIC ACID



Seed oils are some of North America's most widely consumed edible oils, owing to their nutritional benefits, versatility, and availability. However, there are contrasting opinions in the press and continued misinformation about seed oils on social media, which makes it challenging for consumers to separate conjecture from scientific consensus.

A recent peer-reviewed paper published in the [British Journal of Nutrition](#) represents a comprehensive summary of the evidence, which supports the overall health benefits of consuming seed oils rich

in the omega-6 polyunsaturated fatty acid, linoleic acid.¹ We've asked two contributing authors to share their insights on the scientific literature, alongside two registered dietitian nutritionists to comment on practical applications.

So, whether you're counseling your patients or clients – or browsing your local supermarket or newsfeed – read on to confidently address frequently asked questions on seed oils.

All studies and findings mentioned throughout these responses are part of the recently published, peer-reviewed perspective of scientific literature.

Seed oils are a subset of vegetable oils that are derived from seeds rather than the fruit of plants. These include canola, corn, cottonseed, grapeseed, rice, safflower, sesame, and soybean. While the composition of different seed oils may vary, they are all relatively high in unsaturated fatty acids and low in saturated fatty acids.²

MEET OUR EXPERTS



Kristina S. Petersen, PhD

Dr. Petersen was a contributing author on the peer-reviewed paper published in the British Journal of Nutrition

Kristina Petersen is an associate professor at Penn State University leading research on dietary interventions for cardiometabolic health. She directs the Diet and Cardiometabolic Health Lab, conducting clinical trials on the effects of foods and dietary patterns on disease risk factors. She is a member of the American Heart Association Nutrition Committee and has contributed to various scientific statements and advisory groups. Kristina has a Bachelor of Nutrition and Dietetics (Honors) from Flinders University (Australia) and a Ph.D. in Nutrition from the University of South Australia (Australia).



Mark Messina, PhD, MS

Dr. Messina was a contributing author on the peer-reviewed paper published in the British Journal of Nutrition

Dr. Messina is the Director of Nutrition Science and Research for Soy Nutrition Institute Global. Over the past three decades, he has devoted his time to the study of the health effects of soy foods and soybean components such as isoflavones, soy protein, and soybean oil. He has published more than 100 peer-reviewed articles and given more than 800 presentations to both consumer and professional groups in 55 countries. Dr. Messina is the chairperson of the editorial advisory board of, and writes a regular column for, *The Soy Connection*, a quarterly newsletter that reaches over 250,000 dietitians and other health professionals. He has also organized and chaired ten international symposia on the role of soy in preventing and treating chronic disease and has organized smaller meetings in the United States, China, India, Brazil, and Italy. Dr. Messina is the co-author of three books, *The Simple Soybean and Your Health*, *The Vegetarian Way*, and *The Dietitian's Guide to Vegetarian Diets: Issues and Applications*.



Melissa Joy Dobbins, MS, RDN, CDCES

Melissa Joy Dobbins has been a registered dietitian nutritionist for 30 years and a certified diabetes care and education specialist for 25 years. Her background includes clinical nutrition, outpatient counseling, community nutrition, corporate wellness, academia and research. Melissa is the CEO of Sound Bites, Inc., a food and nutrition communications business promoting sound science, smart nutrition, and good food through a variety of channels including public speaking, media, and social media. As the host of the Sound Bites® Podcast, Melissa interviews experts on a variety of topics and shares evidence-based information and realistic solutions to help people enjoy their food with health in mind. Melissa received a B.S. in Dietetics from Southern Illinois University, Carbondale, and a M.S. in Nutrition from the University of Missouri, Columbia.



Pam Smith, RDN

Pam Smith is a registered dietitian nutritionist, culinary innovator and flavor consultant, best-selling author, TV and radio host and provides strategic menu development and insight for clients such as Disney, Nike, Darden Restaurants, Hyatt Hotels and Resorts, Cracker Barrel, and Firebirds Wood Fired Grill. She is the co-creator of Bahama Breeze and Seasons 52 restaurants, and has hosted all 24 years of the Epcot Food and Wine Festival. Smith has coached professional, corporate and life athletes in winning plans— the NBA's Shaquille O'Neal, Orlando Magic, and the PGA. She has authored 17 books, including her best-selling *Eat well—Live Well* and her daily radio spot "Living Well" is heard on over 800 stations nationwide. As founding principle of Shaping America's Plate and co-chair of The Culinary Institute of America's Healthy Menus R&D Collaborative, Smith works to increase offerings of fresh, innovative, and tasty menu options that are delicious, nutritious, and sustainable – helping to serve up "Delicious Wellness" one plate at a time at top restaurants and home kitchens across America.

The Research:

What does the research say about seed oil consumption?

Seed oils, including soybean oil, contain unsaturated fatty acids like the omega-6 polyunsaturated fatty acid, linoleic acid. Diets rich in linoleic acid have been shown to exert numerous health benefits according to a peer-reviewed paper on the scientific literature coordinated by Soy Nutrition Institute Global (SNI Global).¹

This data indicates that seed oils containing linoleic acid lower blood cholesterol levels and may increase insulin sensitivity without exerting any adverse effects such as increasing oxidative stress or inflammation.¹

– Mark Messina, PhD, MS

Do all seed oils have the same dietary fat composition?

Seed oils have markedly different fatty acid profiles. Soybean oil, for example, has one of the highest amounts of polyunsaturated fatty acid, linoleic acid;² and because replacing saturated fat in the diet may help lower cholesterol and may reduce the risk of heart attack,³ soybean oil has a qualified health claim by the U.S. Food and Drug Administration (FDA) that states, ‘supportive but not conclusive scientific evidence suggests that eating about 1½ tablespoons (20.5 grams) daily of soybean oil, which contains unsaturated fat, may reduce the risk of coronary heart disease.’⁴ On the other hand, canola oil has higher amounts of monounsaturated fatty acid, oleic acid.² Oils high in monounsaturated fats (containing at least 70% oleic acid) may be recognized for a qualified health claim.⁵

– Mark Messina, PhD, MS



To learn more about the science on seed oils, visit SNIglobal.org/seedoils

The Health Benefits:

Do seed oils support heart health?

Strong evidence suggests that seed oils may positively contribute to cardiovascular health and can be a beneficial part of a healthy diet. For example, linoleic acid found in soybean oil has been shown to have a favorable effect on both total cholesterol and LDL-cholesterol levels when used as a replacement for dietary saturated fat without adversely affecting HDL-cholesterol and triglycerides.

Seed oils also contain varying amounts of monounsaturated fatty acids. Some evidence indicates that replacing saturated fatty acids with monounsaturated fatty acids may modestly improve blood pressure.⁶

– Kristina S. Petersen, PhD

Do seed oils impact other chronic diseases?

Population studies show that higher intake of unsaturated fats may help reduce the risk of type 2 diabetes. For example, a meta-analysis including 102 clinical trials with over 4,000 adults found that replacing 5% of calories from saturated fat with unsaturated fats significantly lowered blood sugar levels and insulin resistance.⁷

Another study with over 200,000 U.S. men and women, showed that dietary linoleic acid intake was significantly inversely related to risk of incident Type 2 Diabetes Mellitus over the nearly 3-decade follow-up period.⁸

All in all, studies suggest that eating more unsaturated fats, especially polyunsaturated fatty acids, may help manage and reduce the risk of developing type 2 diabetes.^{9,10}

– Kristina S. Petersen, PhD

What about the importance of consuming a balanced ratio of omega-6 to omega-3 fatty acids?

The dietary ratio of omega-6 to omega-3 fatty acids is no longer considered an important metric of diet quality. The current recommendation from prominent health organizations is to ensure that adequate quantities of each type of fatty acid are consumed because both omega-6 and omega-3 fatty acids are beneficial.¹¹ The good news is that soybean oil and canola oil provide both omega-3 and omega-6 fatty acids. In fact, soybean oil is an excellent source of alpha-linolenic acid (ALA) omega-3s.²

The Academy of Nutrition and Dietetics, the American Heart Association, and the U.S. Dietary Guidelines for Americans recommend intake of vegetable oils, including seed or omega-6 polyunsaturated fatty acid-containing oils, as part of healthy dietary patterns.

– Kristina S. Petersen, PhD

Application:

Are seed oils suitable for all types of eating patterns?

Yes! Seed oils can be part of any eating pattern. As a registered dietitian, I frequently field questions about seed oils based on concerns circulating on social media. I remind my patients (and my colleagues) to stick with the science to help them make well-informed food decisions.

Not only are these oils beneficial to our health, they're an affordable and accessible option for ourselves and our patients or clients. Incorporating unsaturated fats into our diets delivers essential fatty acids that we need to consume, and the safety of these oils is fully supported by the evidence. Plus, the Dietary Guidelines for Americans (DGA) encourages the replacement of saturated fats with unsaturated fats to support cardiovascular health.³

– Melissa Joy Dobbins, MS, RDN, CDCES

Which seed oils are best to grab at the store and how do you use them?

Given there is much versatility among seed oils, it's good to educate your patient or clients on how to pick the right one. Aside from the fatty acid composition, choosing the best oil will depend on the taste profile and the desired culinary application, especially, when it comes to the smoke point. Cooking oils beyond their smoke point can lead to the formation of compounds that cause off flavors. For example, soybean oil's smoke point is 450 degrees F while canola oil is 435 degrees F and corn oil is 410 degrees F, so it's important to be mindful of that when choosing which oil to use. Soybean oil in particular has a neutral taste, which means it won't impact the overall flavor profile of the food being heated or prepared.

Seed oils like soybean and canola are great for sautéing or grilling veggies, creating dressings for salads and sandwiches, and baking your favorite treats. Corn, canola, and soybean oils all fall into the ideal stovetop frying temperature of 350-375 degrees F.

– Pam Smith, RDN

What is the best way to store seed oils?

Storing oils properly and protecting them from light, oxygen, and heat will help prevent them from going rancid. I always recommend storing oils tightly sealed in a dark, dry, and cool location such as a pantry or cupboard, away from heat sources. Since the shelf life of different seed oils varies, for freshness it is recommended to use these oils within 6-12 months of purchase and within 3-5 months after opening.

– Pam Smith, RDN

Soy Nutrition Institute Global coordinated the peer-reviewed paper. Financial support was provided by the United Soybean Board, National Corn Growers Association, Corn Refiners Association, Canola Council of Canada and U.S. Canola Association.

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