

The Dangers of Modern Seed Oils in Our Diet

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Most Americans by now are aware of the dangers presented to their health by “white processed sugars” or even “processed white flour.” They may even be familiar with the detrimental effects of dyes, colorings and other artificial ingredients on their health and that of their children. However, until recently, most people have not been made aware of the dangers of modern processed vegetable oils, more concisely called “seed oils.” Furthermore, most of us do not realize the pervasiveness of these harmful oils in our food supply. In this article I hope to offer some insight into the history of seed oils in our diet; why seed oils are bad for our health; the dangers of consuming seed oils and the tools you will need to navigate the often misleading information disseminated to us by “Big Ag,” “Big Pharma,” (large agricultural companies whose sole aim is profit and not producing healthy foods) and other profit-driven outlets.

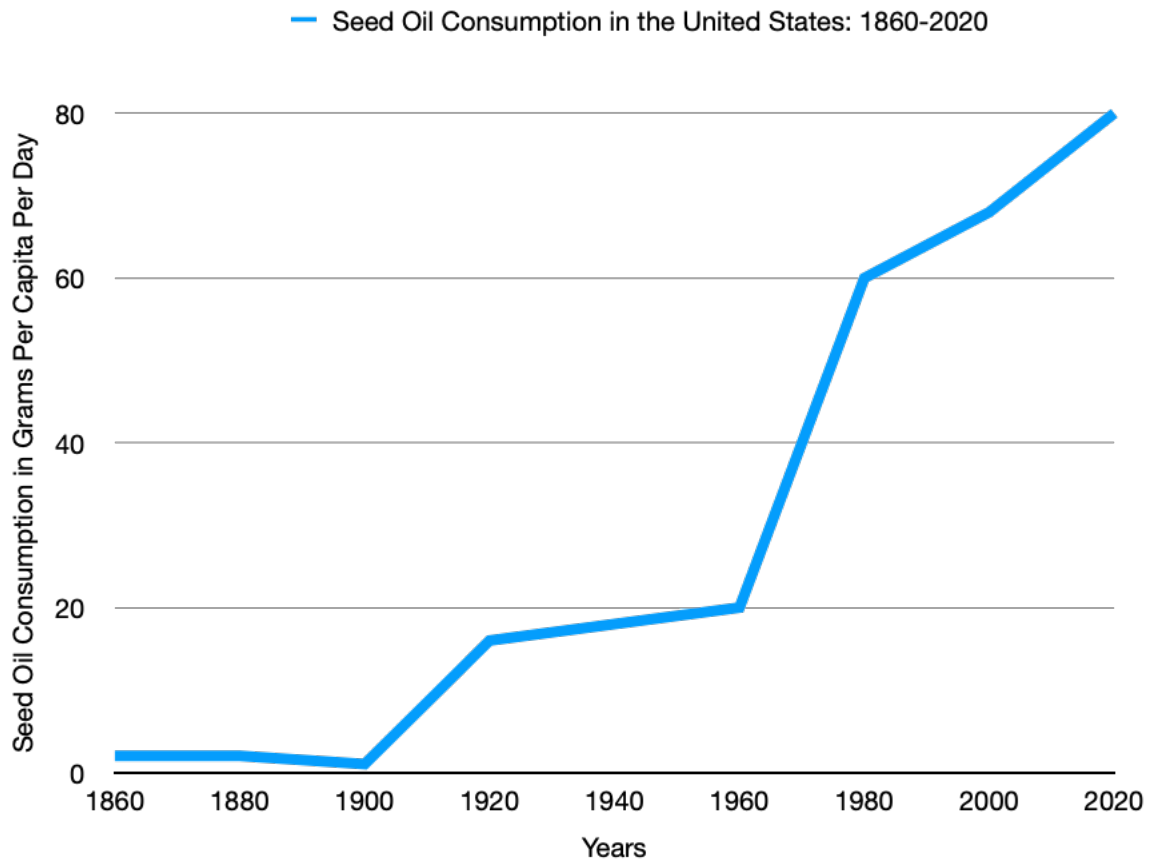
Seed oils have become a significant topic of discussion in nutrition and health circles, particularly concerning their potential dangers. To understand the controversy surrounding seed oils, it's important to delve into their history, production processes, nutritional content, and the associated health risks that have been identified.

To fully understand why industrial vegetable/seed oils are so bad for us, we must first understand the history of how and why they became such a prevalent part of our modern diet. The use of seed oils dates back to ancient civilizations, but their commercial production and widespread use are relatively recent phenomena. Historically, oils were derived from animal fats or fruits like olives and coconuts where they could be easily pressed from the fruit without the use of chemical solvents and industrial machinery which were not available. The truth is that seed oils the way we know them today were never part of our ancestral diet in the manner in which we are consuming them. However, the industrial revolution brought about significant changes in agriculture and food production, and by the late 19th and early 20th centuries, advances in technology made it possible to extract oils from seeds on a large scale. This period saw the introduction of oils like soybean, corn, sunflower, safflower, and cottonseed oil into the food supply.

Historically speaking, industrial seed oils did not appear on the scene in the United States until after the Civil War toward the turn of the century. Think about that in terms of how long humans have been around on this planet. It is believed that they first entered into the American food supply shortly after the Civil War in the form of cottonseed oil.¹ This was followed by soybean oil just after the turn of the 20th century (1905). Within a period of only a few decades after this, the food supply was flooded with seed oils like soybean, corn, canola, rapeseed, grape seed, sunflower, safflower and others. In the United States, soybean oil now has the highest level of

¹ <https://www.westonaprice.org/podcast/how-vegetable-oils-destroy-our-health/#gsc.tab=0>

consumption of any edible oil.² Essentially, we went from zero consumption a mere 145 years ago or so, to nearly 80g/day as illustrated in Chart 1 below.³



This leads us to a very critical and important question: Why did seed oils suddenly rush onto the scene at this time in history? To understand this, we must become familiar with two industrial businessmen by the name of William Procter and James Gamble. These two men were entrepreneurs in the soap and candle making business around the turn of the century. At that time they relied heavily on pork lard from animal fat as a raw material. As explained in her book *The Big Fat Surprise* by Nina Teicholz, it was a German chemist by the name of Wilhelm Normann who was the key figure in the progression of this story.⁴ Normann had developed an inexpensive way to turn liquid vegetable oils into solid or semi-solid products through a process of hydrogenation. This process adds hydrogen molecules (often using a metal catalyst like nickel) to liquid unsaturated fats (like cottonseed or soybean oil) to turn them into more saturated products which are solids at room temperature. The key word in this narrative is “inexpensive.”

² <https://www.statista.com/statistics/301044/edible-oils-consumption-united-states-by-type/>

³ Knobbe, C, Stojanoska M. *Med Hypothesis*. 2017 Nov;109: 184-198.

⁴ Teicholz, Nina. *The Big Fat Surprise*. 2014. Pgs 47-95.

Nearly at the same time, the invention of the lightbulb threatened to subvert the use of cottonseed oil as a main source of fuel for lighting (this would eventually make it obsolete as a fuel source and opened the door of opportunity). To add to this, the lard and tallow (pork and beef fat respectively) Procter and Gamble used to make their products was largely controlled by the meat packing industry and much more expensive. The duo realized quickly that they would need their own cheaper alternative for soap and candle making. The displacement of cottonseed oil as the primary fuel source for lighting by the discovery of oil and Normann's hydrogenation process offered the duo just the opportunity they needed. Cottonseed oil was now the answer to their problem, something they themselves could control cheaply and use to produce their soap and candles for bigger profits.

But wait, there is more to this story, and what happened next would drastically change the course of human health and diet forever:

“The process of hydrogenation offered another plus that appealed to their business sensibilities: the oil which could now be chemically altered via hydrogenation produced a solid cooking fat which resembled lard. That is how an oil formerly classified as “toxic waste” became an integral part of the American diet when Crisco was introduced to the market in the early 1900s. The word Crisco is a portmanteaux, or a combination of the words Crystallized and Cottonseed Oil. Crisco would soon come to replace lard as the primary cooking fat in American kitchens.”⁵

This was the catalyst for a burgeoning industry which, with by the onset of the 1950s would soon come to introduce a whole host of other processed seed oils which were cheaper than the traditional animal fats, offered other “benefits” like being solid at room temperature, had shelf-stability and offered myriad applications beyond the scope of this article. Inexpensive processed seed oils (relative to their unprocessed animal fat cousins) combined with strategic marketing would see seed oils become wildly popular and common in American kitchens by the mid and late 1900s. With some ingenuity, dubious marketing/marketing savvy, and of course some financial payoffs (every nefarious story has to have some financial shenanigans), these toxic industrial seed oils would come to be reclassified as “heart healthy.”

What type of strategic marketing and payoffs you ask? Let me explain. The American Heart Association (AHA) received its certificate of incorporation on March 14th, 1924. It was founded by 6 physicians in New York looking for answers to the growing problem of heart disease. Conveniently, the new and poorly funded AHA needed donations, and Procter & Gamble saw their opportunity and pounced, sending them 1.5 million dollars from their radio show Truth or Consequences.⁶ This

⁵ Kresser, C. [How Industrial Oils Are Making Us Sick](https://chriskresser.com/how-industrial-seed-oils-are-making-us-sick/), Feb 2019. <https://chriskresser.com/how-industrial-seed-oils-are-making-us-sick/>

⁶ The History of the American Heart Association; <https://www.onlinesafetytrainer.com/the-history-of-the-american-heart-association/#:~:text=The%20AHA%20remained%20small%20until,its%20reach%20across%20the%20nation.>

donation enabled the small, fledgling association to grow and significantly expand its reach and influence across the country. Conveniently, they would also soon endorse seed oils, now more innocently named “vegetable oils” as heart healthy, an endorsement Procter & Gamble would profit immensely from and use to their advantage in the decades to follow.

At the same time as the AHA was becoming intertwined with Procter & Gamble, a man known as Ancel Keys, who held PhDs in biology and physiology began researching heart disease. He proposed the cholesterol hypothesis which stated that saturated fat in the diet, mostly from animal sources, lead to high levels of blood cholesterol. He blamed this rise in blood cholesterol for causing atherosclerosis (hardening of the arteries) and therefore heart disease. In 1961 Ancel Keys appeared on the cover of Time Magazine and later that same year was appointed to the AHA’s nutrition committee.

The proposition was solidified when Keys published his Seven Countries Study in 1970; purportedly demonstrating beyond question the causal effect of animal (saturated) fat consumption, cholesterol and heart disease.⁷ Logically, Keys would soon turn his ire toward animal fats which are a rich source of dietary saturated fat and recommend eliminating them from the diet. Instead, he recommended the consumption of polyunsaturated fatty acids (PUFAs) which early research had shown to be associated with lower blood levels of cholesterol and heart disease risk. As renowned expert and leading clinician Chris Kresser points out:

“Keys’ conclusions were in line with the industrial seed oil industry’s motives—to get people to eat more seed oils! Soon, ads for “heart healthy” margarine (a solid form of vegetable oil) and other seed oils became commonplace, and healthy, traditional fats were all but forgotten.”⁸

An interesting part of this story which was not told at the time was that research was done pooling data from 7 different countries from the same pool of data Keys had used, showed exactly the *opposite results*. *It turns out that Ancel Keys had cherry-picked his data to show the correlation between saturated fats, cholesterol and heart disease by choosing only data from countries that would support his hypothesis.*

Now that we understand a bit of the unscrupulous history regarding seed oils rise to prominence in the American diet through industry profiteering and conspiring with The American Heart Association, let’s dive a little deeper into the production of these oils and the chemical changes that result so we can gain a deeper understanding of just how unnatural they are and why they are so bad for our health. I will then conclude by discussing the health risks associated with seed oils which have been well established by researchers and clinicians.

⁷ Fenster, Michael S MD. Psychology Today. <https://www.psychologytoday.com/us/blog/you-are-what-you-eat/201604/when-tradition-trumps-science#:~:text=With%20the%20help%20of%20another,the%20American%20consumer%20in%201911>.

⁸ Kresser, Chris. [How Industrial Oils Are Making Us Sick](https://chriskresser.com/how-industrial-seed-oils-are-making-us-sick/), Feb 2019. <https://chriskresser.com/how-industrial-seed-oils-are-making-us-sick/>

The production of seed oils involves several steps, each with potential implications for the final product's healthfulness. The typical process includes:

1. **Extraction:** Seeds are cleaned and then crushed to release their oil. Common extraction methods include mechanical pressing and solvent extraction. Solvent extraction often uses hexane, a chemical solvent, to maximize oil yield. While hexane is removed during refining, trace amounts may remain in the final product.
2. **Refining:** Crude oil extracted from seeds contains impurities such as free fatty acids, phospholipids, and pigments. The refining process involves degumming, neutralizing, bleaching, and deodorizing the oil to make it suitable for consumption. This high-temperature process can degrade beneficial nutrients and produce harmful compounds.
3. **Hydrogenation:** Some seed oils undergo hydrogenation to improve their stability and shelf life. This process adds hydrogen atoms to unsaturated fats, converting them into partially or fully saturated fats. Partially hydrogenated oils contain trans fats, which have been linked to various health problems.

So it is fairly easy to see that what you are left with after the industrial processing is complete, is a damaged, fractionated product devoid of its original components in their natural state. When exposed to light, heat or these harsh chemicals during processing, the polyunsaturated fatty acids abundant in seed oils become oxidized and damaged. This is because they contain multiple carbon-carbon double bonds which are delicate, unstable and open to this oxidative process. When this happens, volatile chemical byproducts known as trans fatty acids and lipid peroxides are formed. Trans fats are well known for their role in causing cardiovascular disease and even diabetes. Noted health expert Chris Kresser points out, lipid peroxides are toxic byproducts that damage DNA, proteins, and membrane lipids throughout the body. The accumulation of lipid peroxides in the body promotes aging and the development of chronic diseases.⁹ Essentially, these damaged fats become incorporated into cell membranes, making them leaky and incapable of functioning properly. The same thing happens to the mitochondria, the organelle responsible for producing energy for the cell, damaging them and making them dysfunctional. As a result, the cells can no longer make energy and function properly.

In effect, this processing to remove the oil from the seed effectively strips the oil of nutrients and antioxidants while creating trans-fats, lipid peroxides and can even leave harsh hexane residues (think gasoline) in the oil. These trans fats, lipid peroxides and other unnatural compounds were not common in our ancestral diet, in fact they were rare. As the Mayo Clinic points out:

“Trans fat is considered the worst type of fat to eat. Unlike other dietary fats, trans fats — also called trans-fatty acids — raise "bad" cholesterol and lower "good" cholesterol. A diet laden with trans fats increases the risk of heart disease, the leading killer of adults. The more trans fats eaten, the greater the risk of heart and blood vessel disease.”¹⁰

⁹ Kresser, Chris. IBID

¹⁰ <https://www.mayoclinic.org/diseases-conditions/high-blood-cholesterol/in-depth/trans-fat/art-20046114>

These trans fats are now ubiquitous in the Standard American Diet (SAD). Any food containing “vegetable oil” or any other seed oil is loaded with them. And despite the fact the FDA has tried to regulate and remove the trans fats from seed oils, loopholes still exist which enable manufacturers to get around this regulation. Any commercially baked good such as cakes, cookies, shortenings (margarine), fried foods (commonly found in fast food and restaurants using seed oils to fry) and even coffee creamers will contain these harmful seed oils and thusly trans fats. To add injury to insult, these manufacturers often add synthetic chemicals like TBHQ, BHA, and BHT in efforts to extend the shelf life of these highly refined products and prevent oxidation. These compounds are known carcinogens and are banned in many other countries throughout the world.

Seed oils are rich in polyunsaturated fatty acids (PUFAs), particularly $\omega 6$ fatty acids. While PUFAs are essential fats that the body cannot produce, an imbalance between $\omega 6$ and $\omega 3$ fatty acids can lead to health issues. This presents another big issue with the consumption of processed seed oils- the upsetting of the ratio between $\omega 6$ and $\omega 3$ fatty acids. The ideal ratio of $\omega 6$ to $\omega 3$ is thought to be around 1:1 to 4:1. However, the modern diet, heavily reliant on seed oils, often results in ratios as high as 20:1 or even 50:1, favoring $\omega 6$.

It is well known that ancestral diets contained approximately a 1:1 ratio of $\omega 6$ to $\omega 3$ fatty acids. Research on the importance of maintaining a low, balanced $\omega 6$ to $\omega 3$ ratio published in The Journal of the Missouri State Medical Association states:

“Up until about 100 years ago, the $\omega 6$: $\omega 3$ ratio has been around 4:1 or less. However, the typical Western diet now provides an $\omega 6$: $\omega 3$ ratio of approximately 20:1 in favor of $\omega 6$. This predisposes to supraphysiologic inflammatory responses and perpetuates chronic low-grade inflammation. The overconsumption of linoleic acid, mainly from industrial $\omega 6$ seed oils, and the lack of long-chain omega-3s in the diet creates a pro-inflammatory, pro-allergic, pro-thrombotic state.”¹¹

So, in essence, seed oils provide the source of the problem, an abundance of linoleic acid (LA), the main $\omega 6$ oil found in seed oils to create this fatty acid imbalance and set the stage for degenerative and inflammatory disease. But why is too much LA bad for us? Well it turns out the LA is a substrate to build pro-inflammatory eicosanoids that aid the body’s inflammatory response (See Figure 1 on the next page below). The problem is, as mentioned above, we used to have a more balanced level of LA ($\omega 6$) with $\omega 3$ fatty acids. So, in essence, the overabundance of modern processed seed oils has tipped the scales in favor of inflammation. And inflammation is at the core of almost all degenerative, autoimmune and systemic diseases including cancer.

Figure 1 below illustrates a simplified graphic of the $\omega 6$ and $\omega 3$ pathways. The purpose of the illustration below is simply to show how overconsumption of the $\omega 6$ LA via processed seed oils, combined with underconsumption of $\omega 3$ -rich foods pressure the biochemical pathways in our body

¹¹ DiNicolantonio, James J PharmD; O’Keefe, James H. MD. The Journal of the Missouri State Medical Association, 2021 Sep-Oct, 118 (5): 453-459.

towards inflammation. Therefore, the more imbalanced we become toward favoring an abundance of $\omega 6$ fatty acids in our diet, the more inflammation and disease we will have. As mentioned previously, the average American has an $\omega 6$: $\omega 3$ ratio of somewhere around 20:1, nearly 20 times the recommended balance. I have included a graph of the different percentages of LA in the different oils/fats consumed most often for ease of reference. The oils colored red in the graph should be avoided as much as possible, those in green should be emphasized.

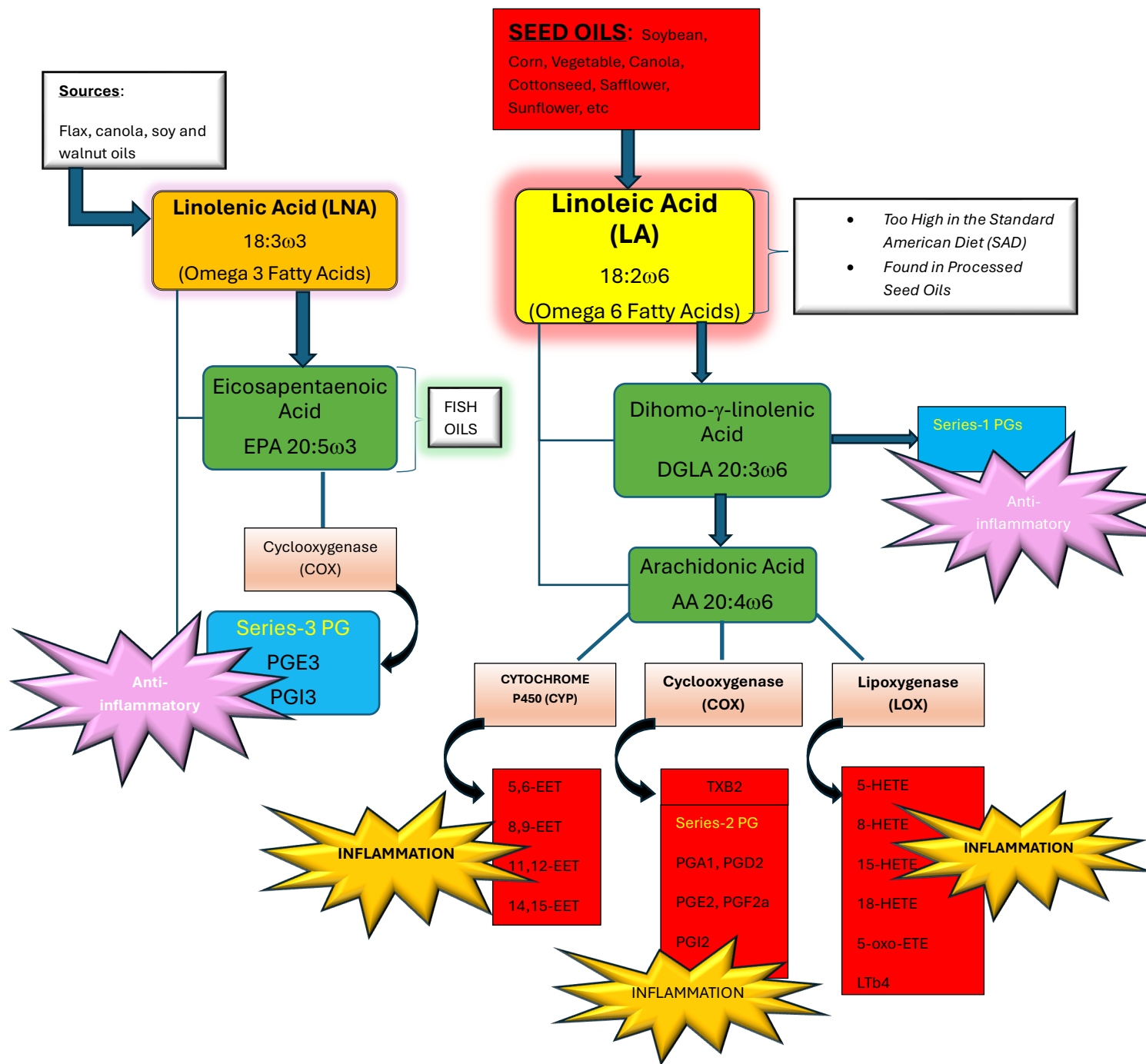


FIGURE 1: The above graphic represents a simplified diagram of the eicosanoid metabolic pathways from omega-3 and omega-6 fatty acids. For clarity I have shown how Seed Oils are the main source of $\omega 6$ polyunsaturated fatty acids which provide the building blocks which lead to inflammation. ***In a normal, balanced and healthy individual consuming an ancestral whole-foods diet, the $\omega 6$ and $\omega 3$ pathways create balance between inflammation and anti-inflammation. However, when adulterated foods containing processed seed oils are overconsumed, the balance is shifted toward inflammation (shown by the inflammatory eicosanoids in the red boxes)*** The fatty acid precursors LA ($\omega 6$) (yellow) and LNA ($\omega 3$) (orange), are converted into eicosapentaenoic acid (EPA, 20:5 $\omega 3$) and dihomo- γ -linolenic acid (DGLA, 20:3 $\omega 6$), respectively. DGLA is further converted into arachidonic acid (AA, 20:4 $\omega 6$). The EPA, DGLA, and AA (green) are then acted upon by the metabolic enzymes shown: cyclooxygenase ("COX"), lipoxygenase ("LOX"), and cytochrome P450 ("CYP"), and converted to numerous bioactive compounds involved in pro-inflammatory (red boxes) and anti-inflammatory (blue boxes) processes.

| COOKING OIL | % LINOLEIC ACID (LA) (RANGE IN PARENTHESES) |
|--------------------|------------------------------------------------|
| SAFFLOWER OIL | 70% |
| GRAPE SEED OIL | 70% |
| SUNFLOWER OIL | 68% |
| CORN OIL | 54% |
| COTTONSEED OIL | 52% |
| SOYBEAN OIL | 51% |
| RICE BRAN OIL | 33% |
| PEANUT OIL | 32% |
| CANOLA OIL | 19% |
| OLIVE OIL | 10% (3% - 27%) |
| AVOCADO OIL | 10% |
| LARD | 10% |
| PALM OIL | 10% |
| TALLOW (CAFO) | 3% |
| GHEE/BUTTER (CAFO) | 2% |
| COCONUT OIL | 2% |
| TALLOW (GRASS FED) | 1% |
| BUTTER (GRASS FED) | 1% |

FIGURE 2: % of Linoleic Acid (LA) found in various common cooking oils. *Those labeled in red have the highest percentage and should be avoided.* Orange and Yellow represent those with moderate amounts of LA. *Those in green have the least LA content and should be emphasized.*

Another important consideration when looking at the dangers of consuming seed oils is the fact that most seed oils come from genetically modified crops. The most common plants used to make seed oils happen to comprise the top genetically modified crops including soybean, corn, cottonseed and rapeseed. Genetic modification involves extracting bacterial or other foreign DNA and inserting it into the DNA of the plant to create a plant with a new, more desirable genetic trait. For example, scientists developed a way to implant bacterial DNA into common food crops to make them resistant to the herbicide RoundUp. This allows farmers to spray over their crops with this herbicide to kill weeds without killing the crop. Scientists do this by isolating a specific gene responsible for this trait and then implanting it into the corn DNA, creating an entirely unique plant. This modification then enables the farmer to spray their crops with herbicides like RoundUp (glyphosate) without fear of damaging the plant (the herbicide will kill the weeds but not the corn for example). Unfortunately, now these crops become contaminated with harsh chemicals like glyphosate which finds its way into our food supply and water. I can speak to this personally having performed laboratory testing for years which showed high levels of chemicals like glyphosate in my patients.

Over the last decade or so there has been mounting research supporting how pesticides and even herbicides like RoundUp are linked to cancers, disruption of the microbiome of the gut,

autoimmune and other degenerative conditions. Consider the following which was published in Forbes:

“Monsanto has settled over 100,000 RoundUp lawsuits, paying out about \$11 billion as of May 2022. There are still 30,000 lawsuits pending. This includes 4,000 cases in multidistrict litigation (MDL) in California. In June 2022, the 9th circuit filed a decision in a RoundUp case. In the court’s opinion the 9th Circuit urged the Environmental Protection Agency (EPA) to reconsider its conclusion that RoundUp does not cause substantial harm to people or the environment. Also in that month, the Supreme Court dismissed an appeal by Bayer in another RoundUp case. In July 2022, the 11th Circuit ruled that Bayer had failed to adequately warn about the risk of cancer from RoundUp.”¹²

Furthermore, to date few studies have been conducted on the long-term safety of consuming genetically modified foods making it even easier to understand why these foods should be avoided at all costs.

The potential dangers of seed oils can be summarized and categorized into several areas:

- a. Inflammation and Chronic Diseases: High levels of ω 6 fatty acids can increase the production of pro-inflammatory eicosanoids (See Figure 1), contributing to chronic inflammation. Chronic inflammation is linked to numerous health conditions, including cardiovascular disease, type 2 diabetes, obesity, arthritis, and certain cancers. The journal *Open Heart* found that ω 6 polyunsaturated fat linoleic acid is likely a major dietary culprit for coronary heart disease, especially when consumed in the form of industrial seed oils commonly referred to as ‘vegetable oils’.¹³
- b. Oxidative Stress: PUFAs are highly susceptible to oxidation, especially when exposed to heat, light, and air. Oxidized fats produce free radicals and lipid peroxides, which can damage cells and tissues, leading to oxidative stress. Oxidative stress is implicated in aging, neurodegenerative diseases, and other chronic illnesses.
- c. Trans Fats: Partially hydrogenated seed oils contain trans fats, which have been shown to raise LDL (bad) cholesterol levels and lower HDL (good) cholesterol levels. This imbalance increases the risk of heart disease, stroke, and other cardiovascular problems. Although trans fats have been banned or restricted in many countries, they may still be present in many processed foods.
- d. Obesity and Metabolic Syndrome: Seed oils are calorie-dense and often found in processed foods, which can contribute to overeating and weight gain. Furthermore, the high ω 6 content can disrupt lipid metabolism and insulin sensitivity, increasing the risk

¹² <https://www.forbes.com/advisor/legal/product-liability/roundup-lawsuit-update/#:~:text=alternative%20active%20ingredients.”- ,Roundup%20Cancer%20Lawsuits,are%20not%20class%2Daction%20suits.>

¹³ DiNicolantonio, James J. Omega-6 vegetable oils as a driver of coronary heart disease: the oxidized linoleic acid hypothesis. *Open Heart* Vol 5, Issue 2.

of metabolic syndrome—a cluster of conditions including high blood pressure, elevated blood sugar levels, excess body fat around the waist, and abnormal cholesterol levels.

- e. Endocrine Disruption: Some studies suggest that seed oils may interfere with hormonal balance. For instance, PUFAs can influence the production and function of hormones like insulin, leptin, and thyroid hormones, potentially leading to metabolic and reproductive issues.

The dangers of seed oils remain a contentious issue among scientists, nutritionists, and health enthusiasts. Proponents argue that seed oils provide essential fatty acids and are a healthier alternative to saturated fats. They cite dubious, outdated studies, often funded by industry and biased, showing that replacing saturated fats with PUFAs can reduce the risk of heart disease.

Critics, on the other hand, highlight the potential negative health effects discussed above. Citing ancestral diets, copious research in the last few decades, and some common sense, they advocate for a return to traditional fats like butter, lard, and coconut oil, which have been consumed for centuries without the modern health issues associated with seed oils. Some also emphasize the importance of balance and moderation, suggesting that the key lies in reducing the overall consumption of processed foods and improving the $\omega 6$ to $\omega 3$ ratio in the diet.

In conclusion, the history and rise of seed oils in the human diet reflect broader changes in agricultural practices and food production. While seed oils are often touted for certain nutritional benefits, their high $\omega 6$ content and the potential for oxidative damage and trans fat formation pose significant health risks. As highlighted in this article, balancing the intake of $\omega 6$ and $\omega 3$ fatty acids, choosing minimally processed oils, and prioritizing whole foods over processed options can help mitigate these dangers.

As a result, I always advise my patients to read labels, and to limit the foods they consume with any of the seed oils mentioned in this article. One of the most prominent food categories this affects are breads and bread products. Modern breads (weather rolls, buns, or just bread for sandwiches) are almost universally made with seed oils, including partially hydrogenated oils. Other common foods laden with seed oils are chips, sauces, dressings, and most package and processed foods. Therefore it is very important to read your labels and know what you are putting into your body. When in doubt, refer to my chart in this article showing you the safest oils/fats to cook with and consume. I hope you will use the information in this article to choose more wholesome, traditional foods which are synonymous with abundant health the way our Creator intended.