

# Soybean Oil Linked to Genetic and Neurological Damage

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✓ Fact Checked

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## STORY AT-A-GLANCE

- › Whether partially hydrogenated, organic or genetically modified to be low in linoleic acid, soybean oil can cause dysfunction at a cellular level
- › Recent research warns soybean oil can cause neurological and metabolic changes associated with autism, Alzheimer's, anxiety, depression, obesity, insulin resistance, Type 2 diabetes and fatty liver disease
- › The animal study compared the health effects of diets high in conventional soybean oil, GE soybean oil low in linoleic acid and coconut oil. Both types of soybean oil had pronounced effects on the brain
- › The soybean diets caused dysfunction in about 100 different genes in the hypothalamus, including one that is responsible for producing oxytocin, which has beneficial effects on your heart
- › Potential health hazards of soybean oil include the harmful health effects of unfermented soy, the potential hazards of GE soy, the harm associated with glyphosate-contaminated food, and high amounts of processed omega-6 skewing your omega-3 to omega-6 ratio

Far worse than the biologic damage caused by refined sugar is the molecular havoc caused by processed vegetable oils. Soybean oil in particular has a questionable safety profile for several reasons, and processed foods are positively loaded with it.

Whether partially hydrogenated, organic or genetically modified to be low in linoleic acid, soybean oil can cause dysfunction at a cellular level. Unfortunately, many health authorities have insisted omega-6-rich vegetable oils like soybean oil are healthier than saturated animal fats such as butter and lard, and this myth has been a tough one to dismantle, despite the evidence against it.

An estimated 94% of the soybeans grown in the U.S. are genetically engineered (GE) to tolerate herbicides,<sup>1</sup> primarily glyphosate (the active ingredient in Monsanto/Bayer's Roundup), which

cannot be washed off. As a result, most soybean-based products are contaminated with glyphosate, which compounds their toxicity.

## Soybean Oil Linked to Genetic and Neurological Damage

Most recently, research<sup>2,3,4,5</sup> published in the journal Endocrinology warns soybean oil – the most widely consumed cooking oil in America – can cause neurological and metabolic changes associated with:

Autism	Alzheimer's disease
Anxiety	Depression
Obesity	Insulin resistance
Type 2 diabetes	Fatty liver disease

The study, done on mice, compared the health effects of diets high in conventional soybean oil, GE soybean oil low in linoleic acid and coconut oil. As reported by Neuroscience News:<sup>6</sup>

*"The same UCR research team found in 2015 that soybean oil induces obesity, diabetes, insulin resistance, and fatty liver in mice. Then in a 2017 study, the same group learned that if soybean oil is engineered to be low in linoleic acid, it induces less obesity and insulin resistance.*

*However, in the study released this month, researchers did not find any difference between the modified and unmodified soybean oil's effects on the brain. Specifically, the scientists found pronounced effects of the oil on the hypothalamus, where a number of critical processes take place."*

Your hypothalamus<sup>7</sup> is a key regulator of homeostasis and metabolism in your body, and also plays a role in your stress response and hormone regulation.

According to the authors, the soybean diets (both conventional and GE), caused dysfunction in about 100 different genes in the hypothalamus, including one that is responsible for producing oxytocin, colloquially known as "the love hormone," which has beneficial effects on your heart.

Other dysregulated genes included ones associated with "inflammation, neuroendocrine, neurochemical and insulin signaling." The coconut oil diet had "negligible effect."

The fact that GE soybean oil that is designed to be low in omega-6 linoleic acid had similar effects as conventional high-linolenic acid soybean oil effects suggests linoleic acid isn't the problem, as previously suspected. The study also ruled out another suspected soybean chemical, stigmasterol, as coconut oil enriched in stigmasterol had no ill effects.

The team will continue their investigation in an effort to identify the real culprit behind these genetic effects. In the meantime, co-author Poonamjot Deol, an assistant project scientist at the University of California Riverside, urges people to "reduce consumption of soybean oil."

## Unfermented Soy Linked to Many Health Problems

The idea that unfermented soy in general and soybean oil in particular, are healthy is refuted by thousands of studies linking unfermented soy to a wide range of health problems. In her book, "The Whole Soy Story," Dr. Kaayla Daniel details research implicating unfermented soy in the development of:<sup>8</sup>

Malnutrition	Digestive distress
Immune system breakdown	Thyroid dysfunction
Cognitive decline	Reproductive disorders
Infertility	Cancer
Heart disease	Food allergies

Fermented organic soy, on the other hand, has a number of important health benefits, and are the only soy products I recommend eating. Healthy options include:

- Tempeh – A fermented soybean cake with a firm texture and nutty, mushroom-like flavor.
- Miso – A fermented soybean paste with a salty, buttery texture (commonly used in miso soup).
- Natto – Fermented soybeans with a sticky texture and strong, cheese-like flavor.

- Soy sauce — Traditionally made by fermenting soybeans, salt and enzymes; beware that many varieties on the market today are made artificially, using a chemical process.



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## Problematic Components in Soy

While the featured Endocrinology study was unable to identify the exact soy compound responsible for the genetic damage, there are many plant chemicals found in soy that are capable of causing problems, including:

**Phytoestrogens (isoflavones) genistein and daidzein**, which mimic and sometimes block the hormone estrogen — Isoflavones resemblance to human estrogen is why some recommend using soy therapeutically to treat symptoms of menopause.

However, most of us tend to be exposed to too many estrogen compounds and have a lower testosterone level than ideal, so I believe it's important to limit your exposure to feminizing phytoestrogens.

Even more importantly, there's evidence<sup>9</sup> isoflavones may disturb endocrine function, contribute to infertility and promote breast cancer, which is definitely a significant concern. As noted in a 2017 scientific review on dietary phytoestrogens:<sup>10</sup>

*"Phytoestrogens are plant-derived dietary compounds with structural similarity to 17- $\beta$ -oestradiol (E2), the primary female sex hormone. This structural similarity to E2 enables phytoestrogens to cause (anti)oestrogenic effects by binding to the oestrogen receptors ...*

*Various beneficial health effects have been ascribed to phytoestrogens ... In contrast to these beneficial health claims, the (anti)oestrogenic properties of phytoestrogens have also raised concerns since they might act as endocrine disruptors ... [G]iven the data on potential adverse health effects, the current evidence on these beneficial health effects is not so obvious that they clearly outweigh the possible health risks.*

*Furthermore, the data currently available are not sufficient to support a more refined (semi) quantitative risk-benefit analysis. This implies that a definite conclusion on possible beneficial health effects of phytoestrogens cannot be made."*

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**Phytates**, which block your body's uptake of minerals — Phytic acid binds to metal ions, preventing the absorption of certain minerals, including calcium, magnesium, iron and zinc<sup>11</sup> — all of which are co-factors for optimal biochemistry in your body.

This is particularly problematic for vegetarians, because eating meat reduces the mineral-blocking effects of these phytates. Sometimes phytic acid can be beneficial, especially in postmenopausal women and adult men, both of whom are prone to excessive iron, a potent oxidant capable of causing significant biological stress.

However, phytic acid does not selectively inhibit iron absorption; it inhibits all minerals. This is very important to remember, as many already suffer from mineral deficiencies from inadequate diets.

The soybean has one of the highest phytate levels of any grain or legume, and the phytates in soy are highly resistant to normal phytate-reducing techniques such as long, slow cooking. Only a long period of fermentation will significantly reduce the phytate content of soybeans.

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**Enzyme inhibitors**, which hinder protein digestion.

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**Hemagglutinins**,<sup>12</sup> which cause red blood cells to clump together and inhibit oxygen takeup and growth.<sup>13</sup>

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**Omega-6 fat** (linolenic acid), which is pro-inflammatory — The massive overconsumption of highly refined vegetable oils such as soybean oil is largely due to the wrongful demonization of saturated fats. This has had the effect of turning the average American's omega-3 to omega-6 ratio upside down, which is a major driver of chronic inflammation, which in turn is an underlying factor in virtually all chronic diseases.

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**"Antinutrients" such as saponins, soyatoxin, lectins and oxalates** — While a small amount of antinutrients would not likely cause a problem, the amount of soy and soybean oil that many Americans are now eating is very high.

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**Goitrogens** — Goitrogens,<sup>14</sup> found in all unfermented soy whether it's organic or not, are substances that block the synthesis of thyroid hormones and interfere with iodine metabolism, thereby interfering with your thyroid function.

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## Another Major Hazard of GE Soybeans: Glyphosate

If you need yet another reason to reconsider your consumption of soybean oil, consider this: In addition to having an unhealthier nutritional profile than organic soybeans, Roundup Ready GE soy has been shown to contain high amounts of glyphosate.<sup>15</sup>

According to a 2014 study<sup>16,17</sup> published in Food Chemistry, which looked at the compositional differences between various types of soybeans, glyphosate readily accumulates in Roundup Ready soybeans, and GE soybeans contained a mean glyphosate residue level of 3.3 milligrams per kilo. The most contaminated samples contained as much as 8.8 mg of glyphosate per kilo.

Meanwhile, a 2010 study<sup>18</sup> in the journal Chemical Research in Toxicology found malformations in frog and chicken embryos occurred at 2.03 mg of glyphosate per kilo. The malformations primarily affected the face, skull, brain and spinal cord. According to this study:

*"Organic soybeans showed the healthiest nutritional profile with more sugars, such as glucose, fructose, sucrose and maltose, significantly more total protein, zinc and less fiber than both conventional and GM-soy.*

*Organic soybeans also contained less total saturated fat and total omega-6 fatty acids than both conventional and GM-soy. GM-soy contained high residues of glyphosate and AMPA ... Conventional and organic soybean batches contained none of these agrochemicals.*

*Using 35 different nutritional and elemental variables to characterize each soy sample, we were able to discriminate GM, conventional and organic soybeans without exception, demonstrating "substantial non-equivalence" in compositional characteristics for 'ready-to-market' soybeans."*

It's important to realize that once applied to crops, glyphosate actually becomes integrated into the cells of the plant, so it cannot be washed off. And, while the chemical industry is still defending the safety of glyphosate, mounting research suggests it can harm health in a number of different ways.

Importantly, the chemical has been shown to decimate beneficial gut bacteria. Glyphosate has also been shown to cause DNA damage<sup>19</sup> and to act as an endocrine disruptor.<sup>20</sup> For an overview of how glyphosate's impact affects your health, see "Roundup May Be Most Important Factor in Development of Chronic Disease."

## **Safeguard Your Health by Ditching Vegetable Oils**

To recap, there are several potential health hazards of soybean oil to consider, either alone or in combination:

1. The harmful health effects of unfermented soy
2. The potential hazards of GE soy
3. The harm associated with glyphosate contaminated food
4. High amounts of processed omega-6 skewing your omega-3 to omega-6 ratio

If you want to avoid dangerous fats of all kinds, your best bet is to eliminate processed foods from your diet. My comprehensive nutrition plan offers helpful guidance for this process.

When cooking, coconut oil, butter, lard and ghee are healthy options. Also be sure to swap out margarines and vegetable oil spreads for organic butter, preferably made from raw grass fed milk. Butter is a healthy whole food that has received an unwarranted bad rap.

Other healthy fats to include in your diet are avocados, raw dairy products, olive oil, olives, organic pastured eggs and raw nuts. To further balance your omega-3 to omega-6 ratio you may also need a high-quality source of animal-based omega-3 fat, such as krill oil, if you're not in the habit of eating small, fatty fish such as sardines, anchovies and mackerel, and/or wild caught Alaskan salmon.

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