

# Fat Overview

## Polyunsaturated Fats

This is the bad stuff  
Classified as vegetable oils  
Really seed oils  
Canola, Corn, Soybean, etc.  
Mostly Omega 6 - inflammatory  
Unstable when heated  
Break down when exposed to light  
Oxidize when exposed to air  
Extracted with solvents (see attached)  
Readily produce free radicals (ROS)  
Nutritional nightmare  
Eliminate from diet immediately  
**Health Effect - Negative**  
(see attached info pamphlet)

## Monounsaturated Fats

These fats are ok  
Oils pressed from the flesh  
Extra Virgin Olive & Avocado Oils  
Not essential, but can be beneficial  
Some Omega 3 fatty acids  
Predominately Omega 9 fatty acids  
Still fairly unstable  
Need to be protected from light  
Heat produces instability  
Conventional brands beware  
May be using solvents to extract  
Look for: Cold-pressed and Organic  
Raw Nuts & Seeds (not all are equal)  
Nuts & Seeds should be refrigerated  
Use occasionally and sparingly  
**Health Effect - Neutral**

## Saturated Fats

These fats are the best choice  
Saturated fat is stable  
Saturated fat tolerates heat very well  
Doesn't increase free radical formation  
Grass-fed = Omega 3  
Omega 3 = Anti-inflammatory  
Meat & Fat for Grass-fed Animals  
[Eat wild-caught cold-water fish](#)  
SATURATED FAT SOURCES  
Grass-fed Butter  
Grass-fed Tallow  
Wild-raised Lard  
[Coconut oil](#)  
Unrefined Red Palm Oil  
Use regularly

### Health Effect - Positive

#### BENEFITS

Calcium Absorption  
Hormonal Balance  
Mood Regulation  
Body Warmth  
Cell Membrane Strength  
Supportive to the Heart  
Protect the Liver  
Essential to Brain and Nerves  
Vital for Lung Health (surfactant)  
Vital to Kidney Function  
Proven Anti-Inflammatory

**Important Note:** The fats from grain-fed animals should be considered unhealthy. Their diets, being predominately corn and soy, will negatively affect their Omega 3 to Omega 6 ratios. Do your best to eat animals that are raised eating foods that are in agreement with their digestive apparatus and without the use of drugs and hormones.

## How Industrial Fats & Oils are Made

- Manufacturers start with the cheapest seeds (usually soy or canola), extracting the oil at very high temperatures and pressures; the last fraction of oil is removed with hexane, a toxic solvent.
- At this point, the oils are a brown, smelly, rancid gunk. They are subjected to steam for cleaning. This destroys all the vitamins and natural antioxidants, but pesticides and solvents remain.
- Additional refining involves more heating, addition of chemicals, drying, degumming, deodorization and the addition of dangerous industrial antioxidants. In all, the fragile liquid oils are heated five times before they are bottled.
- To make hardened fats manufacturers use a process called partial hydrogenation. The oils are mixed with a finely ground nickel catalyst and then put in a reactor where at high temperatures and pressures, they are flooded with hydrogen gas. The molecular structure is rearranged—what goes into the reactor is a liquid oil, what comes out is a smelly, lumpy, gray semi-solid.
- Soap-like emulsifiers are mixed in to remove all the lumps; the oil is steam cleaned (again!) to remove the horrible odor; the oil is then bleached to get rid of the gray color; synthetic vitamins and artificial flavors are mixed in; the mixture is packaged in blocks or tubs and promoted to the public as a health food.

### THE FUTURE OF TRANS FATS

In 2013 the FDA determined that *trans* fats were no longer “Generally Recognized as Safe (GRAS),” and the Institute of Medicine determined there is no safe level of *trans* fat consumption. The industry must phase out *trans* fats by 2018. They will be largely replaced by other industrial products, such as “interesterified fats.” No clinical trials exist on metabolism of interesterified fats, just as there were none on the *trans* fats.

“Partially hydrogenated” oil on a food label indicates the presence of *trans* fats. Companies must list *trans* fats on food labels only if there is more than half a gram per “serving,” so many labels indicate zero *trans* fats even though they may be present in considerable quantities.

## Good Fats, Bad Fats

The GOOD FATS are traditional fats and oils that mankind has used for thousands of years. These are mostly saturated animal fats. Saturated fats are actually very healthy, needed for proper growth, fertility, healthy babies, cell function, hormone production and optimal function of the heart, lungs and kidneys. They also provide important vitamins A, D and K2.

- Butter and ghee for cooking and spreading
- Cream and whole milk
- Egg yolks
- Lard (pig fat) and bacon grease for cooking
- Tallow (beef fat) for frying
- Duck fat and goose fat (good sources of K2)
- Coconut oil
- Palm oil
- Olive oil for salad dressings
- Sesame oil (cold pressed) in small amounts
- Cod liver oil in small amounts for vitamins A and D

Anything that contains industrial fats and oils is a BAD FAT:

- Cooking oils
- Margarine
- Spreads
- Shortening
- Artificial whipped cream
- Non-dairy creamers
- Snack foods (chips, pretzels, cookies)
- Cake frosting
- Fried foods
- Commercial mayonnaise
- Dips
- Commercial salad dressings
- Commercial nut butters and spreads
- All fast food, including pizza
- Most restaurant food

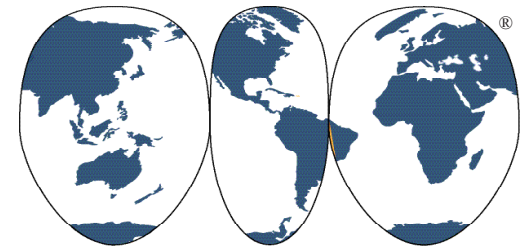
### SOURCES AND FURTHER INFORMATION

[www.westonaprice.org/know-your-fats/](http://www.westonaprice.org/know-your-fats/)

*Nourishing Fats* by Sally Fallon Morell

# The Dangers of Industrial Fats & Oils

Liquid Polyunsaturated Oils & Solid Partially Hydrogenated *Trans* Fats



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## What are Industrial Fats & Oils?

Industrial fats and oils—also called vegetable oils—came on the market with the invention of the stainless steel roller press in the 1890s. This technology allowed manufacturers to squeeze oil out of hard seeds. Prior to that time, the only plant-based oils came from oily fruits like the olive, coconut and palm fruit, and very oily seeds like flax seed and sesame seeds, which could be extracted using a slow-moving stone press.

The first seeds that manufacturers used to produce vegetable oil were cottonseeds—a waste product of the cotton industry. The manufacturer—Proctor and Gamble—used very clever marketing strategies to advertise the liquid oils for cooking and salad dressings and the industrially hardened (partially hydrogenated) shortenings (such as Crisco) for cooking and baking. They promoted the idea that their cottonseed oil products were safer and healthier than traditional fats and oils like butter, lard, tallow and coconut oil.

Soon manufacturers learned to extract oil from corn, soybeans, safflower and other seeds. Today, 80 percent of all vegetable oil comes from soybeans. They are the basic ingredient in cooking oils, margarine, spreads and shortenings used in the home, and in cookies, pastries, chips, bars, snack foods and commercial fried food.

Since vegetable oils contain no cholesterol (only animal foods contain cholesterol) and are very low in saturated fat, the vegetable oil industry created the false impression that foods containing cholesterol and saturated fat were bad for us, but the vegetable oils were good.

Unfortunately, it is becoming increasingly evident that the industrial fats and oils—whether liquid or solid—cause many health problems in adults and children. Moreover, the traditional fats, especially animal fats, are critical for good health, for fertility and for having healthy children. While there are many unhealthy ingredients in the modern diet, those that have the most serious adverse effects are the industrial fats and oils.

## Dangers of Liquid Vegetable Oils

Liquid polyunsaturated vegetable oils cause uncontrolled reactions in the body.

**CANCER:** Polyunsaturated liquid vegetables oils are very fragile. They easily become rancid, breaking down into compounds called free radicals and aldehydes. These compounds are highly carcinogenic, and especially cause cancer in the presence of carcinogens like industrial chemicals and pesticides.

**HEART DISEASE:** Although liquid vegetables oils may lower cholesterol levels temporarily, they cause heart disease in other ways; rancid oil molecules initiate damage in the arteries that can lead to plaque build up. They also increase uric acid levels in the blood, a marker that is strongly associated with heart disease.

**PREMATURE AGING:** Highly reactive vegetable oils cause damage all over the body that can lead to premature aging, especially excessive wrinkling of the skin.

**IMMUNE FUNCTION:** Polyunsaturated oils interfere with the immune response.

**LIVER DAMAGE:** Polyunsaturated vegetable oils depress the liver's ability to detoxify.

**DEPRESS LEARNING ABILITY:** In children, consumption of liquid vegetable oils can depress learning ability.

**REPRODUCTIVE ORGANS AND LUNGS:** Liquid vegetable oils can be especially damaging to the reproductive organs and the lungs. The lungs need saturated fat to function properly.

**POOR GROWTH IN CHILDREN:** Children need animal fats like butter to grow strong and tall. Vegetable oils do not supply needed fat-soluble vitamins as animal fats do.

**WEIGHT GAIN AND OBESITY:** When the body processes polyunsaturated oils, more fat ends up in the fat cells and isn't easily released for energy, signaling the body to find more energy. This makes us feel hungry more frequently, often craving more junk food containing polyunsaturated oils.

## Dangers of *Trans* Fats

Hardened industrial fats contain *trans* fats, which inhibit reactions in the body, including enzymes and receptors.

**CANCER:** Consumption of *trans* fats is associated with increased rates of cancer in many studies; *trans* fats interfere with enzymes the body uses to protect itself against cancer.

**DIABETES:** *Trans* fatty acids interfere with the insulin receptors in the cell membranes, thus triggering type II diabetes.

**HEART DISEASE:** *Trans* fats raise the levels of atherogenic lipoprotein-a (Lp(a)) in humans.

**IMMUNE FUNCTION:** *Trans* fats interfere with both B and T cell functions, thus reducing the immune response.

**FERTILITY AND REPRODUCTION:** *Trans* fats interfere with enzymes needed to produce sex hormones; they decrease the levels of testosterone in male animals and increase the level of abnormal sperm.

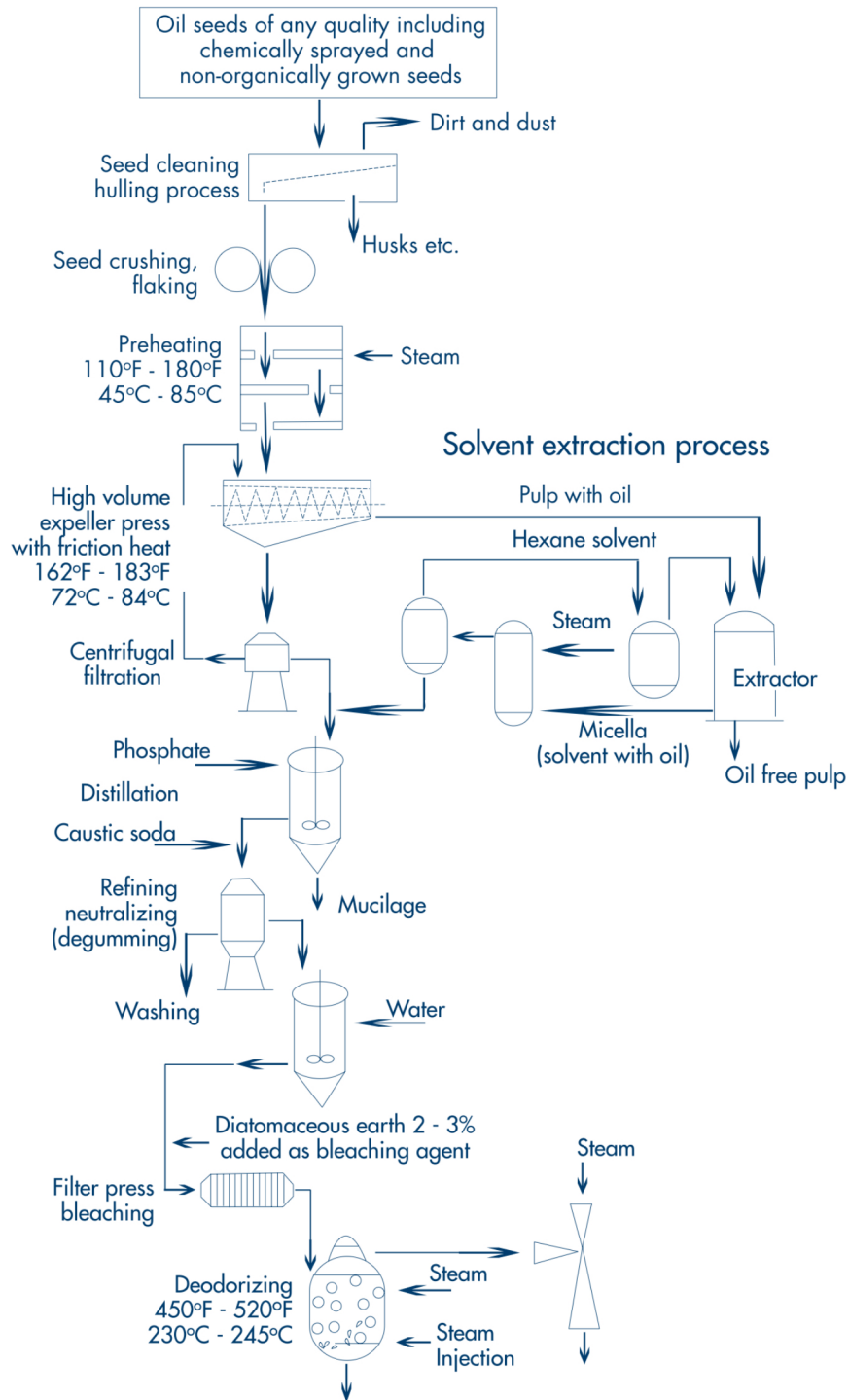
**LACTATION:** In animals and humans, consumption of *trans* fats lowers the overall fat content in mother's milk, thus compromising the nourishment to the infant. In addition, *trans* fats can cross the mammary gland into mother's milk and interfere with neurological and visual development of the infant.

**DEVELOPMENT AND GROWTH:** *Trans* fats can cross the placenta, creating many problems for the developing fetus including low birth weight and interference with brain development.

**OBESITY:** Women who consume *trans* fatty acids have a greater likelihood for obesity than women who do not consume *trans* fats, even though caloric intake is the same.

# How Oils Are Manufactured

## Refined Oils



### REFINED OILS

Little nutritional value.  
Nutrients either altered or removed. Contains poisonous trans fatty acids, free radicals and other toxic substances.

## How Margarine and Shortenings are Made

- ♦ Manufacturers start with the cheapest seed oils, extracted at high temperatures and pressures from corn, cottonseed, soybeans, safflower seeds and canola.
- ♦ The last fraction of oil is removed with hexane, a toxic solvent.
- ♦ The oils, already rancid from the extraction process, are steam cleaned. This destroys all the vitamins and antioxidants, but pesticides and solvents remain.
- ♦ The oils are mixed with a finely ground nickel catalyst.
- ♦ The oils are then put in a reactor where at high temperatures and pressures they are flooded with hydrogen gas. The molecular structure is rearranged—what goes into the reactor is a liquid oil, what comes out is a smelly, lumpy, grey semi-solid.
- ♦ Soap-like emulsifiers are mixed in to remove all the lumps.
- ♦ The oil is steam cleaned (again!) to remove the odor of chemicals.
- ♦ The oil is then bleached to get rid of the grey color.
- ♦ Synthetic vitamins and artificial flavors are mixed in.
- ♦ A natural yellow color is added to margarine—synthetic coloring is not allowed!
- ♦ The mixture is packaged in blocks or tubs and promoted to the public as a health food.
- ♦ Even low-*trans* and soft spreads go through many of these processes; and they contain many harmful fillers and additives.

## *Trans* Fats vs. Saturated Fats

Dietitians and government spokespersons are finally admitting that *trans* fats have many harmful effects; unfortunately, they continue to insist that *trans* fats are “just as bad” as saturated fats (the kind found in butter, meat fat and the tropical oils), implying that saturated fats are very harmful. In fact, saturated fats play many important roles in the body chemistry and have the opposite effect of *trans* fats.

- ♦ *Trans* fats raise Lp(a) (indicating they cause heart disease), while saturated fats lower Lp(a).
- ♦ *Trans* fats interfere with immune function, while saturated fats enhance immune function.
- ♦ *Trans* fats promote inflammation; saturated fats reduce inflammation.
- ♦ *Trans* fats inhibit the body’s use of omega-3 fatty acids and the production of long-chain omega-3 fatty acids, while saturated fats enhance the body’s use of omega-3 fatty acids and the production of the long-chain versions.
- ♦ Foods containing *trans* fats are associated with increased asthma; saturated fats are needed for the proper functioning of the lungs.
- ♦ *Trans* fats contribute to weight gain, while some types of saturated fats (the medium-chain triglycerides) boost metabolism and help with weight loss.
- ♦ *Trans* fats are associated with increased cancer and decreased fertility. Sources of saturated fat, such as butter and meat fats, contain many nutrients that fight against cancer and promote fertility.

## All About *Trans* Fats



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## What are *Trans* Fatty Acids?

*Trans* fatty acids are a type of fat molecule produced by a process called “partial hydrogenation,” which rearranges the hydrogen atoms in liquid unsaturated fatty acids to produce an unnatural fat, which like saturated fat, is solid at room temperature.

Natural saturated fatty acids are straight molecules that pack together easily so they tend to be solid at room temperature. In a saturated fatty acid such as stearic acid, each carbon atom is joined to two hydrogen atoms. The hydrogen atoms are arranged in pairs, thus creating stable electron clouds. Each one of our cell membranes is composed of billions of fatty acids; chemical reactions occur in the cell membranes at sites where two hydrogen molecules form electron clouds.

Natural unsaturated fatty acids, such as oleic acid, tend to be liquid at room temperature. They have two or more hydrogen atoms missing where the carbons are double bonded together, but the remaining hydrogen atoms at the double bond are paired on the same side—called the *cis* configuration—forming electron clouds where reactions can take place in the cell membrane.

During the process of partial hydrogenation, one of the hydrogen atoms in a pair is moved to the other side of the molecule, forming a *trans* fatty acid, such as elaidic acid—*trans* means “across.” This causes the molecules to straighten out so that they pack together easily and form a solid fat at room temperature. This is the kind of fat that manufacturers use for frying and to make cookies, crackers and other baked goods; it is less expensive for manufacturers to use partially hydrogenated vegetable oils for these purposes than natural saturated fats like butter, lard, tallow, palm oil and coconut oil.

Unfortunately, when these *trans* fatty acids are incorporated into the cell membrane, they are missing the hydrogen pairs needed for chemical reactions to occur. The result is dysfunction and chaos on the cellular level.

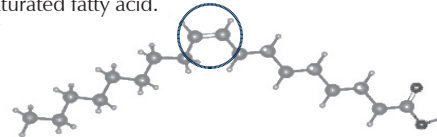
## How to Avoid *Trans* Fat

Until recently, *trans* fats were used in most processed foods, such as commercial baked goods, crackers, bread, chips, pretzels, snack foods and salad dressings. Having learned how dangerous *trans* fats can be, many manufacturers have reduced the amounts in processed foods—often by substituting liquid vegetable oils, which can be just as dangerous. And *trans* fats are still in the food supply, not only in some processed foods but also in the shortening most restaurants use for frying. Any food item containing “partially hydrogenated” oil contains *trans* fats. Small amounts of *trans* fats occurring in deodorized vegetable oils (such as canola oil) and mono- and di-glycerides are not labeled.

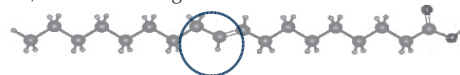
The only way to avoid dangerous processed fats and oils is to avoid processed foods. Instead, prepare your own foods using traditional fats such as butter, lard, tallow, goose fat, duck fat, palm oil and coconut oil for cooking and baking; and olive oil for salad dressing. Use butter instead of margarine or spreads. (Even “low-*trans*” spreads should be avoided as they are made from highly processed seed oils and contain many additives.)



STEARIC ACID, a naturally saturated fatty acid.



OLEIC ACID, a monounsaturated fatty acid with two hydrogens forming a pair at the double bond, in the *cis* configuration.



TRANS ELAIDIC ACID, one of the common man-made *trans* fatty acids, with two hydrogens across from each other at the double bond.

### SOURCES AND FURTHER INFORMATION

*Trans Fatty Acids in the Food Supply* by Mary G. Enig, PhD,  
*Know Your Fats* by Mary G. Enig, PhD,  
Bethesda Press (301) 680-8600.

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**DEVELOPMENT AND GROWTH:** *Trans* fats can cross the placenta, creating many problems for the developing fetus including low birth weight; they also interfere with the formation of long-chain polyunsaturated fatty acids needed for growth and development, especially development of the brain.

**OBESITY:** Women who consume *trans* fatty acids weigh more than women who do not consume *trans* fats, even though caloric intake is the same.