

Soybean oil

Soybean oil is widely used oil and is commonly called 'vegetable oil'. Soybean oil is a very healthy food ingredient despite the bad publicity regarding fats and oils in general. Soybean oil is very popular because it is cheap, healthful and has a high smoke point. Soybean oil does not contain much saturated fat. Like all other oils from vegetable origin, soybean oil contains no cholesterol. Saturated fat and cholesterol cause heart diseases and mainly found in products from animal origin such as milk, cheese and meat products. Soybean oil contains natural antioxidants which remain in the oil even after extraction. These antioxidants help to prevent the oxidative rancidity.

Food use of soybean oil

Soybean oil is also used by the food industry in a variety of food products including salad dressings, sandwich spreads, margarine, bread, mayonnaise, non-dairy coffee creamers and snack foods. The high smoke point of soybean oil allows it to be used as frying oil. Soybean oil is often hydrogenated to increase its shelf life or to produce a more solid product. In this process, unhealthy trans fats are produced which may raise blood cholesterol levels and increase the risk of heart disease. Food manufacturers are now trying to remove trans fats from their product. For this purpose, scientists are breeding new varieties of soybeans containing oil that does not need to be hydrogenated.

Non-food use of soybean oil

Soybean oil is not only used in food products but is also used as renewable raw material to produce a variety of non-food products including bio diesel, inks, plasticizers, crayons, paints and [soy candles](#).

Storage of soybean oil

Soybean oil has normally a shelf life of 1 year but its better to store the soybean oil only a few months at room temperature. Soybean oil should be stored in a dry and dark place. It should be stored away from heat and if you want to keep soybean oil for longer periods it should be kept refrigerated.

Soybean oil production

The production of commercial soybean oil is complicated. The mechanical production of soybean oil with hydraulic presses is not much used because it's expensive and gives lower yields. Soybean oil is normally produced by extraction with solvents. The production consists of following steps:

Cleaning of soybeans

The soybeans are first cleaned, dried and dehulled prior to oil extraction. The soybean hulls needs to be removed because they absorb oil and give a lower yield. This de-hulling is done by cracking the soybeans and a mechanical separation of the hulls and cracked soybeans. Magnets are used to separate any iron from the soybeans. The soybeans are also heated to about 75°C to coagulate the soy proteins to make the oil extraction easier.

Extraction of soybean oil

First the soybeans are cut in flakes which are put in a percolation extractors and immersed with a solvent, normally hexane. Counterflow is used as extraction system because it gives the highest yield. After removing the hexane, the extracted flakes only contain about 1% of soybean oil and is used as livestock meal or to produce food products such as soy protein. The hexane is separated from the soybean oil in evaporators. The evaporated hexane is

recovered and returned to the extraction process. The hexane free crude soybean oil is then further purified.

Purification of soybean oil

The crude soybean oil still contains many oil-insoluble and oil-soluble impurities that needs to be removed. The oil-insoluble material are removed with filtration and the soluble materials is removed with different processes including degumming (removing of phosphatides), alkali refining (washing with alkaline solution to remove free fatty acids, colorants, insoluble matter and gums) and bleaching (with activated earth or activated carbon to remove colour and other impurities).

Hydrogenation of soybean oil (optional)

This process will increase the stability of the soybean oil and will make it less liquid. However, this process will create more saturated fats and will reduce the favourable unsaturated fats. In addition, trans fats are produced which can cause hearth problems. Hydrogenated soybean oil is used in foods that require more solid fat such as margarines.

Nutritional values of soybean oil

Soybean oil is low in saturated fat and high in monounsaturated fat and polyunsaturated fat. Soybean oil also contains the essential fatty acids linoleic and linolenic. Linoleic and linolenic acids are required for human health. Soybean oil is also rich in omega-3 fatty acids. Omega-3 fatty acids are believed to reduce the risk for heart diseases and may prevent osteoporosis. Soybean oil also contains phytosterols which could lower LDL cholesterol. Soybean oil does not contain cholesterol.

Values per 100 g soybean oil

Water	89.0	g
Energy	884	kcal
Energy	3699	kJ
Protein	0.0	g
Fat (total lipid)	100	g
Fatty acids, saturated	14.4	g
Fatty acids, mono-unsaturated	23.3	g
Fatty acids, poly-unsaturated	57.9	g
Linoleic acid	54.2	g
Oleic acid	20.4	g
Linolenic acid	7.7	g
Palmitic acid	9.6	g
Stearic acid	3.5	g
Carbohydrates	0.0	g
Fiber	0.0	g
Sodium, Na	0.0	mg
Cholesterol	0.0	mg
Vitamin E	17.0	mg

[Source: USDA Nutrient Database for Standard Reference, Food Composition and Nutritional Tables

