

well balanced
SOYBEAN OIL



Vitamin E +

Phytosterols +

Functionality +

QUALISOY™ +

The Marketing Edge +

Versatile & Affordable +

Nutritionally Balanced +

Omega-3 & Omega-6 Fatty Acids +

6TH EDITION

THE MARKETING EDGE

Soy has earned a positive reputation for the many health benefits it may offer consumers, including the prevention of some cancers and coronary heart disease. In fact, the food and Drug Administration (FDA) awarded a health claim for soy's cholesterol lowering properties in 1999. Soy protein's reputation appears to have had a "halo effect" on soybean oil, too.

According to USB's 2008 *Consumer Attitudes about Nutrition* survey, soybean oil was among the top three oils ranked "very healthy" by consumers, along with olive and flaxseed oils.

Manufacturers of packaged goods have recognized the health cache that soy carries as a marketing opportunity. Instead of listing "vegetable oil" on the ingredient label, some have begun to prominently feature soybean oil on their packaging.

+ Soybean oil is **one of two oils** consumers say they use most often.

VERSATILE & AFFORDABLE

For decades, food manufacturers have selected soybean oil for its versatility and competitive pricing. The neutral flavor and well-balanced fatty acid profile of soybean oil make it a desirable ingredient for a variety of applications ranging from baked goods to salad dressings.

	SATURATED FATTY ACID	OLEIC ACID	LINOLEIC ACID [6]	LINOLENIC ACID [3]	OSI [110°C]
Soybean Oil	14	24	54	7	5-6
Low-Linolenic Soybean Oil	14	26	56	≤3	5-8
Mid-Oleic Soybean Oil	14	50-70	8-33	≤3	6-20
High-Oleic Soybean Oil availability 2009-2010	11	>70	~6	≤3	20-50+
Corn Oil	13	28	57	-1	7-8
Sunflower Oil	13	19	67	~0.7	4-5
Canola Oil	7	61	22	9	6-8
Palm Oil	50	39	10	-0.3	15-20
Cottonseed Oil	26	19	54	~0.7	5-8
Olive Oil	13	80	6	~0.6	n/a



LOW-LINOLENIC SOYBEAN OIL— THE FUTURE IS NOW

THE FIRST ENHANCED OIL TO EMERGE OUT OF THE RESEARCH PIPELINE

Today, several low-linolenic soybean oil options are available in the marketplace, each containing less than three percent linolenic oil. Low-linolenic soybeans that currently meet QUALISOY™ quality standards include a VISTIVE™ offering from Monsanto; Pioneer® brand low-linolenic soybeans; and Iowa State University's Ultra Low-Linolenic Soybeans.

The resulting oils include Advantage Low-Linolenic Soybean Oil processed by Cargill; VISTIVE low-linolenic soybean oils processed by Archer Daniels Midland Company, Ag Processing Inc. (AGP), CHS Inc. and Zeeland Farms; TREUS™ Low-Linolenic Soybean Oil, developed in partnership by Bunge and DuPont; and Asoya Ultra Low-Linolenic Soybean Oil.

INCREASED OLEIC IN THE PIPELINE

For improved oxidative stability with superior flavor stability, researchers are developing soybeans with increased levels of oleic fatty acid. Products requiring high heat during processing will benefit from this oil because of

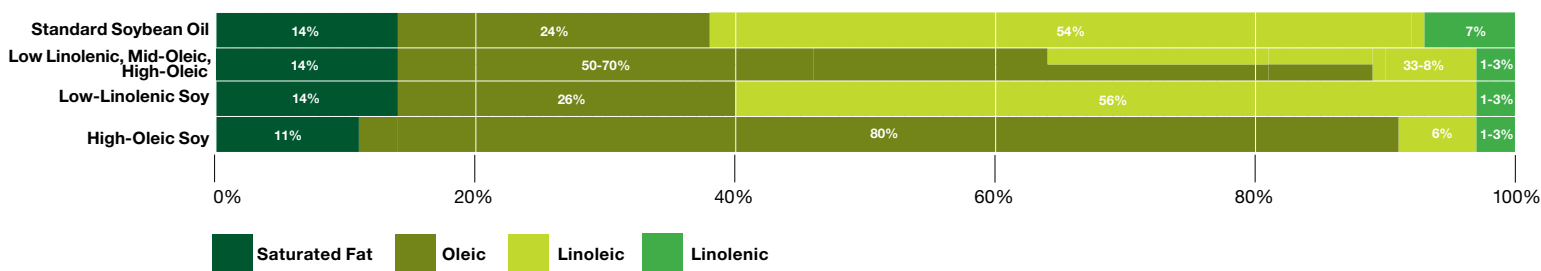
a superior resistance to flavor breakdown. Most varieties of increased oleic will also have a reduced linolenic acid content.

Applications for mid-oleic soy oil (50-70%) include usage as a spray oil for crackers, coating oil for baked goods and as a blending component for formulating numerous types of margarines and shortenings. High-oleic oil (>70%) will further extend usage of soybean oil in bakery applications beyond the applications supported by mid-oleic. However, bakeries can expect competition from the frying industry for supply of this high-performance oil.

A NOTE ON LOW-LINOLENIC OIL & ALA CONSUMPTION

Liquid soybean oil is a major source of an omega-3 fatty acid called alpha-linolenic acid (ALA). This will not change with the introduction of low-linolenic soybean oils because this variety is not designed to replace traditional soybean oil. Rather, low-linolenic soy was developed as an alternative to partially hydrogenated soy oil which contains little if any ALA due to the nature of the hydrogenation process.

THE CHART BELOW SUMMARIZES THIS DATA:



Future trait improvements include a high-oleic (>70%) soybean oil, a high-stearic (approximately 25%) soybean oil, soybean oil with increased omega-3 fatty acids, and a low-saturate (<7%) soybean oil, to replace more cholesterol-raising solid fats.

For the latest innovations, please visit SoyConnection.com.



NUTRITIONALLY BALANCED

Liquid soybean oil is among the healthiest of all edible oils and has a very favorable fatty acid profile. It is low in saturated fat, high in polyunsaturated fat and contains monounsaturated fat. The Institute of Medicine's Dietary Reference Intakes (DRI) acknowledged that unsaturated fatty acids reduce blood cholesterol and lower the risk of heart disease when they replace saturated fats in the diet, and the report provided recommended intakes for both linoleic and alpha-linolenic acid (ALA).

OMEGA-3 & OMEGA-6 FATTY ACIDS

Soybean oil is one of the few non-fish sources of omega-3 polyunsaturated fatty acids, which have various physiological benefits including cardioprotective effects. While fish oil is the preferred source of omega-3s because of the bioavailability of eicosapentaenoic (EPA) and docosahexaenoic acid (DHA), the alpha-linolenic acid (ALA) in soybean oil is the principal source of omega-3s in the American diet. Researchers are currently developing soybeans with increased amounts of stearidonic acid (SDA), EPA and DHA omega-3 fatty acids to meet the growing demand for heart-healthy ingredients.

Omega-6 fatty acids, found naturally in soybean oil, may also decrease risk of heart disease, according to a science advisory published by the American Heart Association in January 2009. Containing about 50 percent omega-6 fatty acids, soybean oil is one of the most concentrated sources of this polyunsaturated fat.

VITAMIN E

Soybean oil is the primary commercial source of alpha-tocopherol, also known as vitamin E. Vitamin E is the body's primary lipid-soluble antioxidant defense against free radical induced cell damage, which has been linked to a number of cancers, heart disease, cataracts, premature aging and arthritis.

- + Of the major vegetable oils consumed in the United States, including corn, cottonseed, canola, palm, peanut, sunflower and soybean oil, **seventy-one percent** is soybean oil. And, soybean oil is the most widely produced edible oil in the world.

PHYTOSTEROLS

Soybean oil contains a number of phytosterols including β -sitosterol, campesterol and stigmasterol. In particular, β -sitosterol and its hydrogenated and esterified derivatives, known as sitostanol esters, have been shown to reduce serum cholesterol and LDL cholesterol by up to 10 percent without decreasing levels of the beneficial HDL cholesterol.

Soybean oil provides 327 mg of phytosterols per 100 grams and is a common source of phytosterol preparations. A number of margarines, spreads and salad dressing products containing β -sitosterol or sitostanol esters are being marketed as cholesterol-lowering products.



- + **Sixty-five percent** of Americans would be more likely to purchase products reformulated to eliminate trans fats, according to the United Soybean Board's 2008 *Consumer Attitudes about Nutrition* survey.



FUNCTIONALITY

The balanced fatty acid profile and neutral flavor make soybean oil a favorite for commercial salad dressings and light frying applications.

Hydrogenation is the process of adding hydrogen molecules directly to the poly- or monounsaturated fatty acid to convert the liquid oil to a solid state for stability and functionality. The process of hydrogenation creates trans fatty acids, which have been compared to saturated fats in terms of overall effects on serum lipid levels and cardiovascular function. Most health authorities do not recommend replacing trans fats with saturates, and instead advocate reducing the total amount of both types of fat in the diet.

The commercialization of low-linolenic soybean oil has replaced some of the partially hydrogenated soybean oil used in the food industry. Today, less than 50 percent of the soybean oil used for domestic food production requires hydrogenation.

To meet the food industry's demand for increased functionality and improved nutrition profiles, researchers are working to develop soybeans with enhanced compositional traits. The resulting oils will offer improved functionality and will reduce or eliminate the need for hydrogenation without adding additional saturated fat.

QUALISOY™

The United Soybean Board (USB) recognizes that the needs of the food industry and the demands of end users are constantly changing. Although soybean oil continues to be the number-one choice for food processors and manufacturers, USB is working with industry leaders and private and public seed breeders to develop soybean oil varieties that do not require hydrogenation while still delivering the superior functionality and flavor characteristics that the food industry has come to expect from soybean oil.





Dedicated to the future of edible oils: As consumer demand for soybean oil increases, the United Soybean Board (USB) is committed to ongoing research and continuous improvement of an already superior product. USB has established a core team of exceptional academic and industry professionals who are developing soybeans with enhanced compositional traits that will result in soybean oil varieties with improved functionality

and nutrition composition. A farmer-led organization comprised of 68 farmer-directors, USB oversees the investments of the soybean checkoff on behalf of all U.S. soybean farmers. For more information, please visit SoyConnection.com.

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