

# Facts about Fats and Oils<sup>1</sup>

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Fats and oils are important for good health. Although fats and oils are not considered a food group, it is recommended that we consume them in small amounts. Fats provide energy and essential fatty acids and enable your body to absorb fat-soluble vitamins (A, D, E, K). Oils are needed in the diet in small amounts because they are a major source of vitamin E, which has antioxidant properties. Linolenic acid, an omega-3 fatty acid, and linoleic acid, an omega-6 fatty acid, are essential for health.

## Types of Fats

There are many different types of dietary fats and oils. These include saturated, monounsaturated, polyunsaturated, and trans fats. All fats and oils contain a mixture of saturated and unsaturated fats but in different amounts. In general, solid fats contain a greater proportion of saturated fats than liquid oils.

**Saturated fats** are found naturally in foods such as beef, lamb, pork, and cheese. Lard (pork fat), butter, and cream also contain higher amounts of saturated fat. The current Dietary Guidelines for Americans includes a recommendation for limiting intake of saturated fats to less than 10% of your total energy intake (USDA and USDHHS 2020) to decrease the risk of cardiovascular disease (e.g., a heart attack). This should be achieved by replacing saturated fats with polyunsaturated and monounsaturated fats. However, the association of saturated fat with heart disease is controversial because the type of saturated fat is also an

important consideration (Chowdhury et al. 2014; Dawczynski et al. 2015; Praagman et al. 2016). Saturated fat from dairy sources may not increase the risk of heart disease (Praagman et al. 2016). One study also suggests that total saturated fat intake may not be associated with an increased risk of death from cardiovascular disease, coronary heart disease, or stroke (de Souza et al. 2015).

**Monounsaturated fats** are found in high levels in olive oil and in oils from high-oleic-acid varieties of canola, soybean, sunflower, and safflower. Beef tallow, lard, peanut oil, and palm oil contain moderate levels of monounsaturated fats. Soybean, canola, and corn oils, as well as cocoa butter, also contain monounsaturated fats. Although higher intakes of monounsaturated fats are encouraged for heart health, recent evidence suggests that the source of the monounsaturated fat is also important (Schwingshackl and Hoffmann 2014). Olive oil may provide a greater benefit because a higher intake of olive oil is associated with a reduced risk of cardiovascular events (e.g., a heart attack) and stroke (Schwingshackl and Hoffmann 2014).

**Polyunsaturated fats** are found in higher amounts in safflower, soybean, sunflower, corn, and cottonseed oils. Walnuts, sunflower seeds, and fish are other good sources of polyunsaturated fats. Polyunsaturated fats include omega-3 fatty acids and omega-6 fatty acids. Fatty fish such as salmon, tuna, and sardines are good sources of long-chain, omega-3 fatty acids. Although it is recommended that you consume polyunsaturated fats instead of saturated

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fats (USDA and USDHHS 2020), most vegetable oils may not provide a strong heart health benefit (Chowdhury et al. 2014). However, eating fatty fish, which provide long-chain omega-3 fatty acids, reduces the risk of heart disease (Kromhout 2012) and stroke (Chowdhury et al. 2012).

**Trans fats** are found naturally in small amounts within certain animal fats. Most trans fat in our diet has been from industry-produced, partially hydrogenated vegetable oils. Hydrogenation is the process of converting a vegetable oil into a more saturated, more solid fat. Since the 1950s, trans fats were widely used to manufacture baked goods such as biscuits, doughnuts, pastries, cakes, cookies, and pie crusts. Fried foods, snack foods like popcorn and crackers, stick margarines and vegetable shortenings have also contained trans fats. Trans fats raise blood cholesterol levels and increase the risk of heart disease (Chowdhury et al. 2014; Mozaffarian, Aro, and Willett 2009). There is no safe level of intake of trans fat. Partially hydrogenated oils containing trans fats are no longer Generally Recognized as Safe (GRAS) and have been eliminated from the food supply (FDA 2018). Naturally occurring trans fats found in low levels in dairy products do not seem to raise cholesterol to the same levels as the trans fats in partially hydrogenated oils (Gayet-Boyer et al. 2014).

## Animal and Plant Sources of Fat

Fats and oils can be categorized by whether they come from an animal or a plant (vegetable) source. Animal fats, such as butter and lard, are primary sources of saturated fats and tend to be solid at room temperature. Fish oils are an exception, as they are liquid at room temperature. Vegetable fats and oils usually contain more unsaturated fats than animal fats. They tend to be liquid at room temperature unless they have been hydrogenated. Because hydrogenated fats are derived from vegetable oils, these fats are also grouped under plant sources. Examples include vegetable shortenings and stick margarine.

## Daily Recommended Amount

The USDA recommends consuming small amounts of oils, about 5 teaspoons per day for most adults (USDA and USDHHS 2015). The USDA MyPlate website provides a table of recommended oil allowances and how much oil and fat are present in common foods (USDA n.d.). See <http://www.choosemyplate.gov/oils>. Although essential for health, oils are a rich source of energy. Solid fats and oils contain about 40 calories per teaspoon, making it important to limit the amount consumed to avoid unwanted weight gain.

## Cooking with Oils

Oils are often used in cooking. Some oils are more sensitive to high temperatures than others. The temperature at which an oil begins to break down is called the smoke point. Cooking at a temperature that is higher than the smoke point of the oil can result in undesirable flavors caused by breakdown products (e.g., aldehydes, ketones). Peanut and sesame oils have high smoke points and therefore are good choices for frying (Bockisch 1998). Flaxseed and walnut oil have low smoke points and are better suited for foods that do not require heating, such as salad dressings (Bockisch 1998). The exposure of oils to high temperatures, and the reuse of frying oils, produces substances that may adversely affect health (Dobarganes and Marquez-Ruiz 2015).

Unrefined oils have been purified to a lesser degree than refined oils. Unrefined oils have a more noticeable color, aroma, and flavor. These oils also have a shorter shelf life than refined oils. In general, unrefined oils are suited for foods such as salad dressings or for lower-temperature cooking, whereas most common refined oils are suited for higher-temperature cooking or frying (Bockisch 1998).

Solid fats are generally more stable than oils due to their higher saturated fat content and lower polyunsaturated fat content. Saturated fats are less likely to become rancid and produce undesirable odors and flavors. Storing oils properly is important because oils may become rancid. Oils should be stored in a cool, dark place. Refrigeration after opening is recommended. Make sure to regularly check your oil and discard it if it has developed an “off” odor, usually described as “painty” or “fishy.”

## Types of Oils

**Canola oil** is derived from the seeds of the canola plant. Canola oil is considered a healthy oil due to its low saturated fat and high monounsaturated fat (oleic acid) contents. Canola oil has a mild, neutral flavor and higher smoke point, making it a flexible option for cooking and baking. It can be used to sauté and stir-fry foods. Canola oil with a very high level of monounsaturated fat (oleic acid) is available to the food industry for use as a frying oil.

**Coconut oil** is extracted from mature coconuts. Although known as an oil, it is a solid fat at room temperature due to its very high saturated fat content. It has a sweet, nutty flavor and is used in stews, curry and fish dishes, and baked goods. It can be used as a substitute for butter for someone following a vegan diet. Coconut oil has a low to medium smoke point (Bockisch 1998).

**Flaxseed oil** is extracted from flaxseed (linseed). Flaxseed oil contains a high amount of polyunsaturated fat, including linolenic acid, an essential fatty acid (Mridula, Barnwal, and Singh 2015). Flaxseed oil is not suitable for frying due to its low smoke point and its lack of oxidative and thermal stability (Boskisch 1998). Using flaxseed oil in salad dressings or for drizzling over pasta or rice dishes is recommended.

**Olive oil** is extracted from ripe olives by pressing. Most olive oil is sold in virgin (unrefined) form. Refined olive oil is used mainly as a food ingredient, e.g., margarine. Extra virgin olive oil is the highest quality olive oil. Olive oil is high in monounsaturated fat (oleic acid) and may help to reduce the risk of heart disease and stroke (Schwingshackl and Hoffmann 2014). It is a healthier option than butter or margarine, can be used in many foods such as spreads and marinades, and is great as a dip for bread or as a salad dressing. Virgin olive oil has a lower smoke point than other oils commonly used for high-temperature frying (Bockisch 1998), but it may be suitable for use at temperatures typically used for home cooking (Li et al. 2016).

**Peanut oil** is derived from peanuts and has a nutty flavor. It is high in monounsaturated fat (oleic acid) and contains vitamin E. Due to its high smoke point, peanut oil is used for deep-frying (Bockisch 1998). It is also used in stir-fries and many Asian dishes. Most peanut oil consumed in the United States has been refined, that is, the protein (which is responsible for the allergic reaction) has been removed (Crevel, Kerkhoff, and Koning 2000).

**Safflower oil** is extracted from the seed of the safflower plant. Safflower oil is high in polyunsaturated fat (linoleic acid) and is suitable for use as a salad dressing and cooking oil. Safflower oil, possessing a very high level of monounsaturated fat (oleic acid), is available to the food industry as a frying oil.

**Sesame oil** is derived from sesame seed. Sesame oil contains both monounsaturated and polyunsaturated fats. It has a strong, nutty flavor and a high smoke point (Bockisch 1998). It can be used in dressings, sauces, stir-fries, and for searing meats. Sesame oil is commonly used in Asian dishes.

**Soybean oil** is derived from soybean seed and is high in linoleic acid (an omega-6 fatty acid). Soybean oil has a low smoke point (Bockisch 1998), and thus it is not recommended for high-temperature frying. Soybean oil, possessing a high level of monounsaturated fat (oleic acid), is available to the food industry as a frying oil.

**Sunflower oil** is made from sunflower seed. Sunflower oil is high in polyunsaturated fat and is suitable for use as a salad dressing and cooking oil. Sunflower oil, which is very high in monounsaturated fat (oleic acid), is available to the food industry as a frying oil.

**Walnut oil** is derived from walnuts by pressing and can be consumed unrefined (Martinez et al. 2010). Walnut oil contains a high amount of linolenic acid, an omega-3 fatty acid. Walnut oil has a deep, nutty flavor and is best used in salad dressings and for drizzling rather than as a cooking oil due to its low smoke point. Walnut oil becomes rancid quickly, so it needs to be stored in the refrigerator.

In summary, consume oils and fats in moderation. Choosing an oil high in monounsaturated fat, such as olive oil, is a positive step toward health.

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