

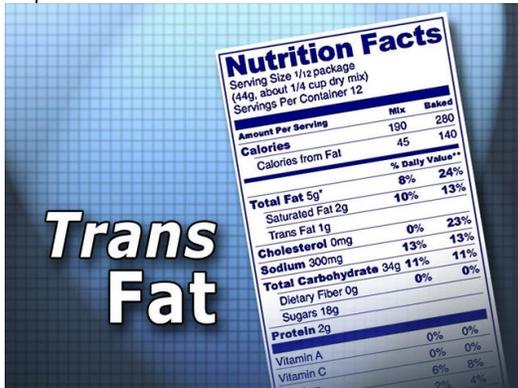
# Trans Fats



## An Overview

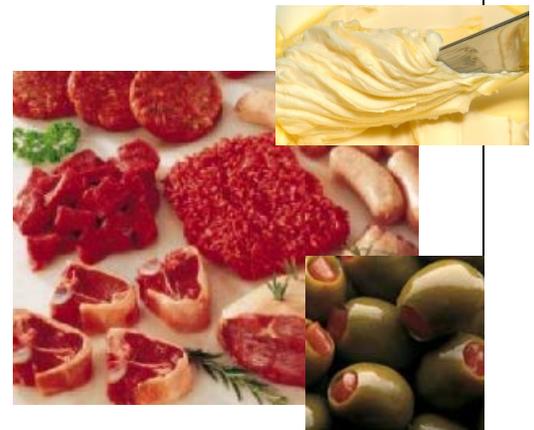
There is a link between **diet and disease**. Some fats correlate with the risk for heart disease while others have a protective effect. More important than the **quantity** of fat is the **type** (or mix) of fat. Frequently, the ratio of good fat to bad fat is very low.

Of the four main types of fats in the foods that we eat (**polyunsaturated, monounsaturated, saturated** and **trans** fats), polyunsaturated and monounsaturated are the preferred fats. Saturated fats and trans fats are those that we should consume the least. These fats are positively associated with the development of insulin resistance and heart disease.



## Dietary Fat

**Dietary fat** is an important source of concentrated energy. Dietary fat supplies important essential fatty acids and fat soluble vitamins A, D, E, K and carotenoids. In a typical diet, dietary fat supplies between 25 and 35 percent of calories. We all require dietary fat in order to survive. Fat has many important functions in the body. Fat is a source of energy and acts as an insulator. Some fatty acids are precursors of important hormones. Fatty acids are also important part of cell membranes, and they are necessary in making nerve coverings.



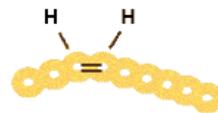
## Dietary Cholesterol

**Cholesterol** is a waxy, fat-like substance made in the intestines and the liver. It can be found in cell walls or membranes including the brain, nerves, muscle, skin, liver, intestines, and the heart. Cholesterol is used to produce many important hormones as well as vitamin D and bile acids which aid in the digestion of fat.

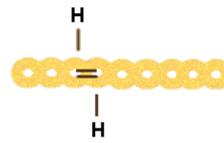
We need cholesterol, but it only takes a small amount of cholesterol in the blood to meet the needs of our body. Dietary cholesterol and **saturated- and trans fats** increase blood cholesterol levels. Excess dietary cholesterol causes a build up of cholesterol in the bloodstream. This leads to cholesterol deposits on the walls of the arteries and makes the vessel walls rigid and hard. When the vessel walls are rigid, this can cause hypertension or high blood pressure. Further cholesterol deposits lead to the narrowing that cause the signs and symptoms of heart disease.

## Trans Fat: Formation

Trans fats are unsaturated fats that are produced through a process known as partial hydrogenation. Through this transformation, the product is altered, and configurations of the double bonds are changed from cis to trans (hence their name). They are more stable. Adding trans fats to crackers and cookies will increase their shelf life. They are mainly found in processed foods and bakery products.



cis-double bond



Trans-double bond



## Trans Fat: The Risks



At present, there are no nutritional benefits from eating trans fats. Research has shown only negative effects from consuming trans fatty acids. Trans fatty acids increase the risk for:

- **Cardiovascular diseases**
- **Type 2 Diabetes**

## Cardiovascular Disease

The link between trans fat intake and risk for disease appears to be strongest for heart disease. Saturated fat and trans fats increase the level of Low Density Lipoprotein Cholesterol (LDL), also known as "bad cholesterol" in the blood. The excess LDL particles are deposited in the arteries leading to hardening of the arteries and heart disease over time. Trans fats decrease High Density Lipoprotein Cholesterol (HDL), also known as "good cholesterol" thereby increasing heart disease risk.

## Type 2 Diabetes

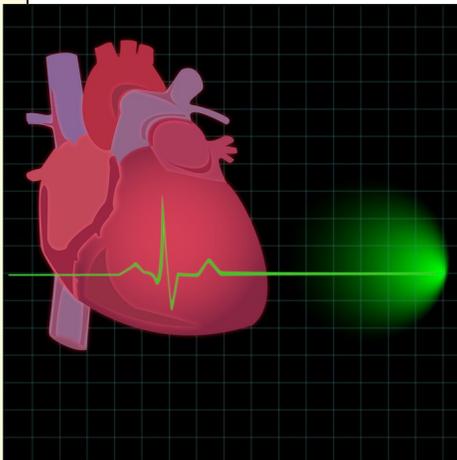
Prior to the development of Type 2 Diabetes, individuals develop a pre-diabetic condition known as insulin resistance. Cells are unable to take up glucose because they no longer respond to insulin's action and glucose builds up in the bloodstream. Individuals have high insulin and glucose levels in this insulin resistant state. Research shows that a high intake of saturated fats and trans fats promote insulin resistance.

## Studies on Cardiovascular Disease

In a large Nurse's Health Study by the Harvard Medical School, the intake of trans fat was significantly correlated with an increased risk for heart disease. In a study of more than 70,000 women, those who had the highest intake of trans fats had 1.33 times higher risk for coronary heart disease (CHD) than those with the lowest intake.

In nearly 700 men who did not have CHD, the relative risk for the disease was two times greater in those that had the highest trans fat intake compared to those that had the lowest intake.

In male smokers that did not have CVD, those that had the highest trans fat intake had 1.39 times higher risk for developing CVD than for men with the lowest trans fat intake. In addition, nonfatal myocardial infarction (MI or "heart attack") and fatal CHD among men with the highest intake was about 1.5 times of those with the lowest intake.





## Food Sources of Unhealthy Fats

Fats that increase Blood Cholesterol	Sources	Examples
Dietary Cholesterol	Foods from animals	Meats, egg yolks, dairy products, organ meats such as liver, heart, etc are the major sources.* Fish, seafood and poultry have less cholesterol.
Saturated Fats	Foods from animals	Whole milk, cream, and ice cream; whole-milk cheeses and butter; lard; and meats.*
	Certain plant oils	Palm, palm kernel and coconut oils; and cocoa butter.*
Trans Fats	Partially hydrogenated vegetable oils	Most commercially prepared desserts (cookies, cakes, pastries donuts); and most fried foods from restaurants, including quick service restaurants (fried onion rings, French fries, burgers, etc).*

\*To maintain a healthy heart, work to reduce or eliminate these foods from the diet\*



## To Increase the Intake of Healthy Fats:

- **Choose lean meats more often than high fat meats.** Choose chicken and fish over sausage or beef when possible. This minimizes the intake of saturated fat and reduces calories.
- **Watch portion sizes and keep meat portions at about the size of the palm of your hand.** Add several vegetables and a starch for a healthy meal.
- **Always choose low- or non-fat dairy choices.** The low and non-fat versions contain the same nutrients (calcium) as the high-fat versions with the extra fat and calories.
- **Choose margarine** (especially soft, light and trans-free versions) **and use corn, canola, olive, safflower, soybean and sunflower oils** more often (avoid stick margarine, butter, solid shortening, lard, or fatback). The recommended choices are lower in saturated fat and cholesterol.
- **Limit high-fat desserts.**
- **Always choose baked, grilled, or roasted** options over those that are deep-fried.

## Dietary Guidelines for Americans (2005)

To decrease their risk of elevated LDL cholesterol in the blood, most Americans need to decrease their intake of saturated fat and trans fats, and many need to decrease their dietary intake of cholesterol. Because men tend to have higher intakes of dietary cholesterol, it is especially important for them to meet this recommendation.

- Consume less than 10 percent of calories from saturated fats and less than 300 mg/day of cholesterol, and keep trans fat intake as low as possible.
- Keep total fat intake between 20 and 35 percent of calories with most fats coming from sources of polyunsaturated and monounsaturated fats such as fish, nuts and vegetable oils.

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#### Authors

Heli J. Roy, PhD, RD  
Shanna Lundy, MS  
Beth Kalicki

#### Division of Education

Phillip Brantley, PhD, Director

#### Pennington Biomedical Research Center

Claude Bouchard, PhD, Executive Director



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