Trans Fat Survival Solution

The Complete Guide to Understanding and Eliminating the Deadliest Fat from Your Diet

By Morton Keogh

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Table of Contents

Part-I: Introduction

1. Trans Fat – An Overview

The right fats and oils can improve the healthiness of our diet. So, it is very important for us to know what types of oil or fat are necessary. High consumption of trans fats, saturated fats and cholesterol increase lipid levels in the blood. This, in turn, increases that person's risk of coronary heart disease or other serious medical consequences.

Trans fat is one type of fat that does us more harm than good.

History

Nobel laureate Paul Sabatier in the 1890s worked towards developing the chemistry of hydrogenation to advance the oil hydrogenation, margarine, and synthetic methanol industries. In 1901, German chemist Wilhelm Normann, found the way to hydrogenate the liquid oils. The year 1909 saw Procter & Gamble acquire the US rights to the Normann patent. Subsequently, Procter & Gamble began marketing the first hydrogenated shortening, Crisco®.

Trans Fatty Acids (TFA)

Trans Fatty Acids (TFA) are a cause of health concern for everyone in the world today. TFA have 'trans'; double bonds within the fatty acid molecule. This imparts the oil with a higher melting point and more solid form. As a result, the food acquires perfect solidity, texture and a longer shelf life.

Around 90 percent of the trans fatty acids in a person's diet today comes from a vegetable or plant-derived primary food source in the form of processed, or fast food.

Snacks like crackers, cookies, potato chips etc. contain around 25-50 percent of their total fat as TFA. Cakes, doughnuts, French fries, fast-food products, etc. are rich in TFA.

Effects of Trans Fats on Human Health and Cardiovascular Disease Risk

The trans fats that we consume through fast foods and other processed food are major causes for coronary heart diseases. A study carried out on 80,082 women over 14 years, showed that the chances of developing coronary heart disease doubled with every 2 percent increase in the energy intake from trans fatty acids. This finding is disturbing by itself but, when compared on an equal intake basis, the risks were even higher.

For example, a 5 percent energy intake in saturated fats increased the risk by 17 percent while a 2 percent greater intake of energy from trans fatty acids increased the risk factor by 93 percent.

Studies have also revealed that trans fats increase the total LDL (Low-Density Lipoprotein) cholesterols and increases the risk of cardiovascular disease. The trans fatty acids also reduce the HDL (High-Density Lipoprotein) cholesterol level.

The lowering of the HDL means a higher risk of cardiovascular diseases.

High trans fatty acids intake may interfere with conversion and metabolism of omega-3 fatty acids too. Omega-3 fatty acids are important for proper functioning of the brain and the eyes.

There is enough evidence to prove that trans fatty acid intake during pregnancy has a highly damaging effect in development and growth of the infants.

American Heart Association Recommendation

The American Heart Association (AHA) recommends strongly to all consumers that they read the nutrition labels before making a purchase of any food product. You should limit consumption of saturated fat to as low as 7 percent of your energy intake and further limit the intake of trans fats to less than 1 percent of energy. Also, please keep the cholesterol intake to less than 300 mg per day.

This ebook discusses the whole subject of trans fats and the potential ill effects on our health.

Part-II: Understanding Trans Fat

2. What is Trans Fat?

There are four types of fats that are found in food:

1) Monounsaturated Fat

2) Polyunsaturated Fat

3) Saturated Fat

4) Trans Fat

Monounsaturated fats, along with the **polyunsaturated fats** are "the healthy fats."

Trans fatty acids are commonly termed as **trans fats** and are the worst kind of fats for our health.

Most trans fats that we consume are industrially created. Partial hydrogenation is an industrial process which transforms good oil into bad oil. Unlike other fats, trans fat is not beneficial for health. Trans fats that come from partial hydrogenated oils are believed to be more of a health risk. Those trans fats should be completely eliminated from our diet.

Partially hydrogenated oil is used as cooking oils for frying in restaurants and is also found in baked products like cookies, cakes, crackers and bread.

Many commercially packed goods and commercially fried foods tend to contain trans fat. In fact, any food product that contains 'partially–hydrogenated vegetable oils,' 'hydrogenated vegetable oils,' or 'shortening' contains trans fat. Trans fat is also easily noticeable in fast-food, snack food, fried food and baked goods.

Researchers have recommendations related to the trans fatty acids. First, trans fatty acids are not essential and provide no known benefit to human

health. Second, both saturated and trans fats increase levels of LDL cholesterol, also known as bad cholesterol, and lowers the level of HDL cholesterol which is a good cholesterol. This increases the risk of Coronary Heart Disease (CHD).

Fully Hydrogenated Oil

Fully hydrogenated oil contains Stearic acid which is converted into oleic acid, a kind of a monounsaturated that does not raise LDL cholesterol when consumed.

Check food labels so that you can minimize the intake of saturated and trans fat. According to the Nutrition Facts Panel, from January 1, 2006, the content of trans fats has to be listed on all the packaged food products.

Trans Fat in Our Food

In the United States, the manufacturers need to list trans fat content on the nutrition label. In other countries, similar steps have been taken by the manufacturers.

However, as of this writing, the USA suppliers are allowed to list Zero trans fats, but still have trace trans fats in the food. Anytime that you see Zero trans fats, still look at the label, then look for the saturated fats, look to see total fats. There may be a small hidden percentage of trans fats that are “under the radar.”

In the USA, if the partially hydrogenated fat is replaced with natural hydrogenated vegetable oil, then almost 30,000 premature coronary related deaths per year might be prevented.

3. The Chemistry of Trans Fats

Trans fat is a fat that includes a trans fatty acid group. Depending on number of the hydrogen atoms in the acids, the fatty acids are categorized as saturated or unsaturated acids. A molecule is saturated if it contains the maximum number of hydrogen atoms. Otherwise, it is unsaturated.

The druggists use the term triglyceride (also known as neutral fat) instead of fat. Triglyceride is a molecule that contains three glycerides (fatty acids), linked through a single molecule of glycerol. The fatty acids comprise long carbon chains with hydrogen atoms connected to their sides (usually two hydrogen atoms on every carbon atom in the chain).

A saturated fatty acid is one in which every carbon atom is attached to two hydrogen atoms. In unsaturated fatty acid, one or more pairs of the carbon atoms along the chain have only one hydrogen atom each. The two carbon atoms of the pair are joined by a double bond instead of a single bond.

Carbon atoms support fatty acid molecules, where each atom is attached with hydrogen atoms.

Carbon atoms are tetravalent and contain four atoms or group of a specified kind, constituting four covalent bonds with other atoms. In saturated fatty acid, each carbon atom is linked to its two neighbor carbon atoms and two hydrogen atoms. In unsaturated fatty acids, the carbon atoms that are absent in a hydrogen atom are joined with double bonds instead of single bonds so that each carbon atom contributes in four bonds.

In unsaturated fatty acids, the hydrogen atoms are placed on the same side of the double bonds of the carbon chain. This configuration of atoms is called ‘cis configuration’, meaning ‘on the same side.’

Depending on the conformation of the double bond, the same molecule, having the same number of atoms, with a double bond in the same place, can be either a trans or a cis fatty acid. Elaidic acid and oleic acid are the

two examples of unsaturated fatty acids with a chemical formula C18H34O2. Elaidic acid is the main trans fat found in hydrogenated vegetable oils, while oleic acid is a fatty acid found in vegetable oils and animals.

Elaidic acid, a kind of trans fatty acid, has a much higher melting point of 46.5 degree Celsius compared to oleic acid with a melting point of 13.5 degree Celsius. Elaidic acid has different physical and chemical properties as well as different bond configuration.

In food production, we should aim at decreasing the number of double bonds and increasing the amount of hydrogen in the fatty acid. By doing this, we can change the consistency of the fatty acid and make it less likely to become rancid.

There are various methods, or techniques, to measure trans fat. One of them is chromatography. Mid-infrared spectroscopy and gas chromatography are the other methods by which trans fat levels can be measured.

4. Hidden Trans Fats in Foods

Presence in Food

Trans fats can be found naturally in the milk and the body fat of the ruminant (cud chewing) animals like cows and sheep. Conjugated Linoleic Acid (CLA also called cis, cis, -9, 12-octadecadienoic acid) and vaccenic acid (molecular name C18 H34 O2), found in natural trans fat, originates in the stomach of these animals.

Earlier, the animal-based fats were the only fats that were consumed. However, today, the largest amount of trans fat is produced by the processed food industry as a side effect of partially hydrogenating unsaturated plant fats. Partially hydrogenated oils are noticed in the fast food, fried food, snack food and commercial baked products such as cakes, cookies and crackers.

Semi-solid fats are required for baking and, since the hydrogenated oils can be used instead of animal fats, bakers prefer to use partial hydrogenated oils. As such, oil also reduces the rancidity and increases the shelf life of the product. Decreasing the refrigeration requirement is another reason that food manufacturers use partially hydrogenated oils.

Trans fats in human milk depends on the maternal consumption of trans fat and the amount of trans fats in the bloodstream of the breastfed infants, which varies with the amounts found in the milk.

In restaurants, trans fats are mainly found in shortenings that are used for deep-frying. Trans fat levels in products varies on a large scale as fast food chains use different fats in different locations. For example, it was found that McDonald's French-fries served in New York had twice as much trans fat as in those served in Hungary.

As hydrogenated vegetable fats provides most dietary trans fat and act as a cheap bulking agent giving a long shelf life and a lavish 'mouth feel', these trans fats are present in a large range of foods. They can be found in

food products that are marketed to children like ice cream, puddings and pudding mix, ready-made pies, pizza, cakes and cake mixes, biscuits, potato chips, doughnuts, fritters, gravy and sauce mixes, margarine, confectionery, and vegetable shortenings, etc.

You can make your own trans fat by reheating cooking oil repeatedly. Trans fats are also found in meat and dairy products since they also occur naturally in the stomach of animals like cows, goats and sheep. Compared to synthetic trans fat found in hydrogenated vegetable oils, these natural trans fats are not harmful to human health.

You can keep an account on consumption of trans fat by seeing a list of the ingredients mentioned on the product when buying it. You might consider not buying a food product if the items listed below are mentioned on it:

1) Hydrogenated vegetable oil

2) Partially hydrogenated vegetable oil

3) Vegetable shortening

4) Margarine

Cakes and Biscuits

The branded food products from suppliers like Cadbury, McVities, Fox and Border Biscuits also contain trans fats. Trans fats are everywhere in ready-made cakes, sweet biscuits, cake and cookie mixes.

Confectionery

The companies that produce products like Mars, Tracker, Twix, Milky Way, Picnic, Snickers, Time Out, Double Decker, Fuse, etc. also use hydrogenated vegetable oil in making their bars. The above-mentioned branded companies promise us and give us the healthy, dynamic, and fit images, which they themselves contradict by using HVOs in their various cereal bars.

Fast Food and Restaurants

To reduce your intake of the hydrogenated vegetable oil, it is advisable to ask the waiter whether the restaurant uses hydrogenated or partially hydrogenated vegetable oils for their cooking. Most of the fast-food centers use trans fats.

Naturally Occurring Trans Fats

Some trans fatty acids are present in milk, meat and other dairy products. These trans fatty acids occur naturally in the digestive systems of ruminant animals such as cows, goats and sheep. These natural trans fats occur in a very small quantity.

Since hydrogenated vegetable oils were introduced, the total intake of trans fats has increased by twenty five times, according to Fran McCullough, author of '*The Good Fat Cookbook*'.

The natural trans fats that occur in animal fats are said to be harmless and may even have a beneficial effect. In these natural Trans fatty acids, there are Trans isomers present which have CLA (Conjugated Linoleic Acid) which is beneficial to our health. Humans can metabolize Vaccenic acid (the main natural trans fatty acid) to CLA.

It is very difficult to differentiate between the good natural trans fats and the bad synthetic trans fats.

That leads us to conclude that the intake of synthetic trans fats only adds to the trans fat that is naturally there in the human diet. Even if we stop eating all the synthetic trans fat, we would still be eating some trans fat.

5. Types of Dietary Fats You Can Choose

It is essential to know about the food that we consume, especially the fats that a food contains. Fats can be characterized as saturated, monounsaturated, polyunsaturated and trans fats. It is not possible to consume food which is completely without fat. But, we can always choose healthier type of fats rather than having fats that are not good for our health.

Fat is essential for our body to function properly. Fat is a source of energy and helps in production of the cell membrane and several hormones, like compounds called eicosanoids (a group of substances derived from arachidonic acid). Dietary fat carries fat-soluble vitamins like vitamin A, D, E, and K from our food to our body.

Fats are also helpful in maintaining healthy hair and skin. There's no doubt that fats are very important and helpful for our body but, at the same time, too much fat could be unhealthy.

If the fats are taken in large amounts, they add excess calories which leads to weight gain and obesity. That can, in turn, lead to serious diseases like cancer, heart disease and osteoarthritis, etc.

Fats, like saturated fat or trans fat, can increase our blood cholesterol level, leading to a higher risk of coronary artery disease.

So, one should choose the best options of fats like unsaturated fats, which can be either monounsaturated, or polyunsaturated fats. When other fats replace these fats, they may lower the risk of heart disease by decreasing the total and Low-Density Lipoprotein (LDL) cholesterol levels in our blood.

Omega 3 fatty acid (a type of polyunsaturated fat) is very useful for our heart as it may decrease the risk of coronary artery disease. It may also guard against irregular heartbeats and help in lowering blood pressure levels.

Monounsaturated fat remains liquid at room temperature and may start to solidify in the refrigerator, whereas polyunsaturated fat is usually liquid at room temperature and in the refrigerator. The best food sources of monounsaturated fat are peanut, olive and canola oils. Most nuts and avocados also have high amounts of monounsaturated fat. Vegetable oils, such as corn, safflower, soy, sunflower and cottonseed oils are high in polyunsaturated fats. Omega-3 fatty acids are polyunsaturated fats and are mostly found in seafood.

Saturated and trans fats can be termed as less healthy fats because they can increase our risk of heart disease by increasing LDL cholesterol.

Saturated fat is usually solid or waxy at room temperature and is found in animal products like whole milk, butter, poultry and red meat.

Trans fat (also known as trans-fatty acid) comes from adding hydrogen to vegetable oil through a process called hydrogenation. It is mostly found in fried foods and baked goods.

According to the US Department of Agriculture (USDA) and the Department of Health and Human Services (HHS), the fat should not make up more than thirty-five percent of our daily calories and most of these fat calories should come from monounsaturated and polyunsaturated sources.

By making the right choice of food products, you can enjoy the best types of fat. For example, you can use olive oil in place of butter and vegetable oil in salad dressings and marinades.

6. What Should You Eat and What to Avoid?

In today's world, where people are health conscious and want to remain healthy and maintain themselves, the question for them is, "What should they eat and what should they not eat?" It is of great interest. At times, when we try to follow nutritional advice, it becomes confusing and we may wonder whether we should actually eat that particular food or not.

1. Cholesterol plays an important role in the structuring and functioning of all our cells. However, we should remember that it is also the main substance in fatty deposits that can build up in our arteries. The main source of cholesterol comes from consumption of animal foods like dairy products, butter, meat, eggs, poultry and seafood. It is advisable that the intake of cholesterol should be less than 300 milligrams a day.

2. Carbohydrates are of two types – Complex and Simple carbohydrates - and their main function is to provide energy to our body. Legumes, grains and starchy vegetables provide us with complex carbohydrates whereas foods that are sweet in taste like fruits, milk and foods made with sugar are sources of simple carbohydrates. It is often recommended that the intake of carbohydrates should be at least 130 grams daily.

3. Fat helps our body to absorb many important vitamins that help to maintain the structure and functioning of the cell membranes. It also helps to preserving our immune system. It is an intense source of energy compared to carbohydrates and proteins. Too high a consumption of certain types of fat, like saturated fat and trans fat, can increase our blood cholesterol levels and lead to a higher risk of coronary artery disease. Nuts, canola, peanut and olive oils are good sources of fats. You should limit fat to 20 percent to 35 percent of your daily calories.

4. Saturated fat is responsible for raising our blood cholesterol, increasing the risk of coronary artery disease in our body. It is commonly found in animal products like whole milk, butter, poultry and red meat. Palm,

coconut and other tropical oils also have high percentage of saturated fat in them. The daily intake of saturated fat should not be more than 10 percent of our total calories.

5. There are two types of fiber; soluble and insoluble. Insoluble fiber, such as vegetables, wheat bran and other whole grains helps in preventing constipation. Soluble fiber, on the other hand, helps to improve our cholesterol and blood sugar levels. Dried beans, oats and some fruits such as apples and oranges are some good sources of soluble fiber. Fiber is the part of plant foods that our body does not digest and absorb. The intake of fiber in women should be 21-25 grams a day and 30-38 grams a day for men.

6. Protein is found in almost all parts of our body. Our bones, skin, muscles and organ tissue all contain protein. It can also be found in our blood, hormones and enzymes. Protein is very important to human life. We get protein from plant foods and also from animal sources. Some of the richest sources of proteins are dairy products, legumes, nuts, seeds, poultry, seafood and meat. Proteins should be 10-35 percent of our total intake of daily calories.

To remain healthy and prevent diseases, like heart disease, you should avoid eating bad fats. You should buy less of food items where the ingredient list includes the words ‘shortening,’ ‘hydrogenated vegetable oil,’ or ‘partially hydrogenated vegetable oil.’ Such items contain trans fat. You should be very careful when purchasing any food product from the market. Even if the label says, “zero trans fat”, it may contain small amounts.

When visiting a restaurant, bakeries or other eateries, it is always good to ask whether partially hydrogenated oil is being used. The intake of saturated fat should be low. Polyunsaturated fat and monounsaturated fats are good fats.

7. Trans Fat Myths

The Myth: Trans fat in our food supply is too low to cause us any harm.

The Fact: Intake of trans fats in the food supply is very harmful.

Many studies and nutritionists suggest that even a very little amount of trans fat intake can cause many health problems. Restriction of the dietary trans fat will reduce or prevent the effects of many diseases and deaths. The death ratio is more from intake of trans fats than people dying in road accidents every year.

The US government, in its dietary guidelines of 2005, warned American people about consuming trans fatty acids. In June 2006, AHA (American Heart Association) advised people in its diet and lifestyle recommendation to cut down the daily intake of trans fat to 1% of total calories, which is equal to 2 to 2.5 gm fat per day.

Fat Intake in a Day

Some people, who are selective and diet conscious, consume very little fat or none. However, many binge on food that exceeds 15 gm trans fats per day.

- One large French fry order at McDonald's may contain 8 gm of trans fat.
- An apple pie may contain 4.5 gm of trans fat.
- A large order of Popcorn Chicken from KFC may contain 7 gm of trans fat.
- A typical three-piece KFC with drumstick, two thighs, potato wedges, and biscuits may contain 15 gm of trans fat.

This is not only a problem of McDonalds, or other fast-food chains, but also of many quality restaurants. The AHA advised food manufacturers and restaurants to replace partially hydrogenated oil with low saturated fat alternatives.

The Myth: Trans fat-free shortenings for baking are not readily available.

The Fact: There are alternatives to trans fat-free baking shortenings.

Palm oil is one other alternative for shortening, but it is not a healthy alternative. Palm and canola oil blends well as a lower saturated fat alternative. The American Institute of Baking has advice about healthy alternatives.

The Myth: It is difficult to restrict the use of the partially hydrogenated oils.

The Fact: It is not difficult at all.

Jason Deli proved that it is possible to restrict use of the partially hydrogenated oil. He eliminated the use of the partially hydrogenated oil from his chain of 156 restaurants and the lunch boxes of 1.6 million students.

The Myth: Trans fat-free oils are not good to taste.

The Fact: Trans fat-free oils are not tasteless.

Today, many restaurants in the USA are using fat-free oils. Many people have a liking for it and relish the food that these restaurants serve.

The Myth: Fat-free oils are expensive and increase the budget of restaurant owners.

The Fact: Trans fat-free oil does not increase the cost of restaurant owners.

The fry-life of trans fat-free oil are just as long as partially hydrogenated oils. Therefore, no restaurant owner needs to worry about the food having a low fry-life. The difference in price may just amount to some cents and one should not risk others' lives to save a few cents.

Part-III: Trans Fat and Your Heart

8. Associating Trans Fat with Heart Disease

Natural fats are complex mixtures of triglycerides which, along with cholesterol, join with protein to form lipoprotein. They travel through the bloodstream, carrying nutrients to various parts of the body. There are two types of lipoproteins namely the low-density lipoprotein and the high-density lipoprotein.

The main health risk comes from consumption of trans fats as they increase the chances of various heart diseases. According to the *England Journal of Medicine*, a study published in 2006 stated that there is a substantial and authentic connection between trans fats consumption and heart disease.

A study from 900 coronary events spanning fourteen years of follow-up showed double risk for every two percent increase in trans fat calories consumed. By contrast, it takes around fifteen percent or more increase in saturated fat intake to produce a similar effect. Consuming non-trans unsaturated fats in place of carbohydrates reduces the chances of coronary heart disease rather than increase it. Further, five percent replacement of food energy from saturated fat with non-trans unsaturated fat reduces the risk by forty-three percent.

The Low-Density Lipoprotein (LDL) consists of more than seventy-five percent cholesterol. In fact, there is more cholesterol in the form of LDL circulating in our body. The LDL comprises a smaller amount of protein than the other lipoproteins.

A certain level of LDL in the bloodstream is normal. However, when the number of LDL rises, it then becomes a cause for major health concerns. The excess LDL forms a plaque in the walls of the arteries and contributes towards formation of atherosclerosis. This is the primary cause of coronary heart disease. This is also the reason why LDL is the ‘bad cholesterol’.

However, many case histories indicate that the cholesterol that one associates with LDL may be a catalyst for coronary heart disease. However, it has come to light that decreasing cholesterol levels in the blood can lower the risk of heart disease.

Several studies on diet further reveal that saturated fats cause the increase in the total cholesterol and LDL cholesterol. In addition, trans fats are responsible for various heart diseases. Not only does trans fat increase the LDL cholesterol, it reduces the amount of HDL cholesterol too.

However, there isn't adequate study or research to show the mechanism by which trans fats increase the LDL cholesterol, nor is there enough study to show the mechanism of trans fat decreasing HDL cholesterol.

But, the studies that have been made so far on the health impact of fats, suggest that trans fats and saturated fats are the source of the primary effects for heart disease. The reduction of saturated or trans fats may reduce the risk of heart disease.

Part-IV: Other Health Risks

9. Hidden Dangers of Trans Fat

As we know, trans fat is not a good fat and we should avoid consuming it.

It has been found that the negative consequences of trans fat can extend beyond the cardiovascular fat.

Cancer: The American Cancer Society has not determined the association between trans fats and cancer. Neither is there a scientific opinion that consumption of trans fat increases the risk of cancer. But, a possible link between trans fat and prostate cancer has recently been found.

Diabetes: It is assumed that the risk of type 2 diabetes increases with trans fat eating, but it has not been confirmed. For example, one study found that risk is higher for those people who eat the highest quartile of trans fat. Another study found that there is no diabetes risk once other factors, such as total fat intake and BMI (Body Mass Index), were considered.

Obesity: It has been found that trans fat may add to weight gain and abdominal fat, regardless of a similar caloric intake. To prove this, an experiment was carried out where it was revealed that monkeys fed with a trans fat diet put on 7.2 percent of their body weight, compared to 1.8 percent for monkeys on a monounsaturated fat diet.

Liver Dysfunction: Trans fats are metabolized in a different way by the liver than other fats and interfere with delta 6 desaturase (an enzyme which helps in converting necessary fatty acids to arachidonic acid and prostaglandins).

Fertility: It has been found that two percent increase in the intake of energy from trans unsaturated fats, as opposed to that from carbohydrates, was associated with a 73 percent greater risk of ovulatory infertility.

The trans fats produced during hydrogenation are worse than the animal saturated fats and saturated tropical oils.

Many people lose their lives by consuming trans fat, as they confuse the human body and its various metabolic paths and they end up in the wrong places doing the wrong things.

Other Bad Effects of Trans Fats

- Trans fats raise LDL and lowers HDL levels.
- It promotes formation of arterial plaque, which may lead to high blood pressure, heart disease and stroke.
- Makes over-indulgers more susceptible to cancer, obesity, multiple sclerosis (a chronic progressive nervous disorder concerning loss of myelin sheath) and diverticulitis (inflammation of a diverticulum in the digestive tract).
- Decreases reaction of human cells to insulin, an aspect in both adult-onset type-2 diabetes, and obesity.
- The birth weight of a newborn is reduced when trans fats are consumed by pregnant women and they pass into the tissues of the unborn babies.
- The cream level and the amount of essential fatty acids is reduced when consumed by lactating mothers.
- Weakens the immune system
- Action of enzymes that destroys toxic and carcinogenic chemicals is inhibited.

10. Trans Fat and Cholesterol

The human body's cells make cholesterol from dietary intake. The cholesterol flows in the bloodstreams to other cells or for elimination by the body. It is the building block of the cells, vitamins and hormones in the body.

How to Keep a Check on Cholesterol

According to health experts, you should try to limit cholesterol to 300 mgs or less per day. However, you have to keep in mind that having too much saturated fats and trans fats in the diet may lead to high blood cholesterol. Therefore, eat a diet that comprises of fruits, vegetables and grain products and has fiber in it. This will not only help you maintain a healthy body weight, but it will also help you control the blood cholesterol.

How are Trans Fat and Cholesterol Related?

There are two types of cholesterol:

1. Low-Density Lipoprotein (LDL), this is the bad cholesterol. When this cholesterol increases, it builds up in the walls of the arteries and makes them narrow and hard.

2. High-Density Lipoprotein (HDL), this is the good cholesterol which picks up the excess cholesterol and propels it back to the liver. This also means that there is lower risk of heart disease.

Trans fat has an unhealthy effect on our cholesterol level. Trans fats increases the LDL (Low-Density Lipoprotein) and decreases the HDL (High-Density Lipoprotein).

It is a reason for major concern and a high risk factor, when the LDL cholesterol rises too high. A high-rise in the LDL cholesterol can cause atherosclerosis. Atherosclerosis is a condition where fatty acids, also known as plaque, deposit on the artery walls. The plaque reduces the blood flow through the arteries and causes severe trouble. If your arteries

are affected, you may complain of chest pain and other coronary artery (the artery that supplies blood to the heart) disease symptoms.

The plaques may tear, rupture or form blood clots and block the flow of the blood by breaking or plugging an artery. If the flow of blood to the artery stops, you will have a heart attack; on the other hand, if the flow of blood stops to the brain then you have a stroke.

What is the ideal LDL and HDL target?

Measurement of cholesterol is in milligrams per deciliter or mg/dL. Let us take a look at what is the appropriate LDL and HDL target:

LDL targets

1. 160 mg/dL is a high amount.

2. 130 mg/dL and lower than this is a remarkably good target for healthy people.

3. 100 mg/dL is the target check, if you have other heart disease.

4. 70 mg/dL must be your target if you have heart disease.

HDL targets

1. 40 to 50 mg/dL is a normal measurement for a healthy man.

2. 50 to 60 mg/dL is normal measurement for a healthy woman.

3. 40 mg/dL and lower is a condition of risk for men and women both.

The lower the HDL value the greater is the risk of heart disease.

11. Trans Fats, Diabetes and Obesity

Diabetes and obesity are major culprits for the devastating life state of many wealthy and poorer countries of the world today. Improper eating habits and the unhealthy way of life are responsible for some diseases. Increased intake of sugar and refined carbohydrates are a main cause for this.

The question that comes to mind is, is Trans fat also responsible?

The evidence is indeed growing. The probable cause is absorption of trans fats into cell membranes and impairment of their function. The cell fats, in return, reduce their response to hormones such as insulin. A poor response to insulin leads to obesity, since the body is unable to convert the fat reserves to usable energy. The need to increase the physical energy rises and that promotes eating more, rather than encouraging the proper utilization of the stored fat. This results in unnecessary fat accumulation in the body, rising weight and more related health problems.

A recent scientific publication reported that trans fats are indeed responsible for type 2 diabetes. Research carried out by Harvard University, looked into the relationship between fat consumption and type 2 diabetes. Around 84,204 women in the age group of 34-59, who did not suffer from diabetes, cardiovascular diseases or cancer, were part of the study. Over 14 years, 2,507 of them had developed the type 2 form of diabetes. There was no correlation between the type 2 form of diabetes and the intake of fat, whether saturated or monounsaturated fat. On the other hand, a 5 percent increase of polyunsaturated fat in diet reduced the risk by 37 percent, whereas there was a reported 39 percent increase in risk with trans fats in the diet.

Trans Fat and Obesity

Trans fat does not just makes you fatter with the same number of calories, but also increases the fat around your belly. This is because Trans fats puts

new fat around the belly and seems to also move fat from other parts of the body towards the belly.

In a research study, 51 male monkeys were fed a Western-style, calorie controlled diet which contained 35% fat. Another group got a lot of trans fat and the remaining monkeys were given unsaturated fats such as olive oil. Theoretically, the monkeys should not have gained any weight, but they did. Incidentally, they put a lot of fat on around the belly. Trans fat consumption therefore increases weight. Even 5 percent weight loss may bring about a great change in the diabetes level.

Trans Fat and Diabetes

The concern for type 2 diabetes due to trans fats is increasing by the day. There are more studies still required to be carried out to reach a conclusion. A study indicated that the risk was more for those in the highest quartile of consumption of trans fats, whereas another study did not find that risk if the BMI and total fat intake was under control.

'Ineffective insulin' is no different from normal insulin. Its problem lies in the failure of our cell population to react to it and not in any biochemical change in the insulin itself. It is pertinent to note that diabetes is a disease that influences almost every cell in our body. The biochemistry of our cellular metabolism changes from the normal state.

Diabetes leads to the failure of the body to metabolize fats, oils and carbohydrates. As a result, there is ineffectiveness of insulin and a failure to metabolize carbohydrates. There are not enough insulin receptors in the cell membrane. On the other hand, the healthy plasma membrane is relatively fluid and slippery due to Cis type w=3 unsaturated fatty acids. When there is deficiency of Cis fatty acids due to lack of it in our diet, then trans fatty acids and medium-chain saturated fatty acids substitute them in the cell membrane. They make the cell membrane stiff and stickier, which slows down the movement of glucose. The mobility of GLUT4 is affected, the biochemistry of the cell is distorted and the number of insulin receptors

reduces on the surface of the cell. However, more study is required in this field, researching the exact relationship between fat metabolism and diabetes.

There have been reports that claim that medical science blames the Trans fats for the failure of the plasma cell membrane to facilitate the GLUT 4 transporter, to cease flow of glucose to the cell. The reports further ask that, if we did not consume trans fat and only eat short and medium chain saturated fats, would we not get type 2 diabetes? The answer appears to be yes - we still would. In fact, the presenters of the report claim that the body uses the trans fats or saturated fats in cell membrane repair only when the Cis w=3 fats are not available in the body constantly. The consequences are in the appearance of the trans fats and saturated fats in excess in the membranes, leading to stiffening of the membrane and manifestation of type 2 diabetes.

12. Trans Fats, Pregnancy, Breast Feeding and Babies

Trans fats from hydrogenated vegetable oil reach the growing fetus through the placenta of a pregnant woman. This generally results in low birth weight and it may lead to preeclampsia for the mother.

The damage may not just be limited to the birth but might continue to harm the mother and child, even after the birth. Trans fats displace the essential fatty acid from the mother's milk, which is most important for growth and development of the baby's brain and nervous system.

How Much Trans Fat is in Mothers' Milk?

A study by the Nutrition Research Division of Health Canada of 198 Canadian mothers, found that the human milk fat content had an average of 7.2 percent trans fats. The range of the Trans fats presence was between 0.1 to 17.2 percent. On analysis, these Trans fats seemed to be from hydrogenated vegetable oils.

In a similar study of 51 Hong Kong Chinese women, an average of 0.88 percent of trans fats was present in their milk. This clearly indicates a lower intake of dietary hydrogenated oil.

A similar test was carried out in lactating rats to see the effect of trans fats. Rats on a 10% Trans fats diet produced milk that contained 6 percent trans fats, where as the rats on 25 percent trans fats diet produced milk with 16 percent trans fat milk.

In another part, the newborn and the maternal rats were fed large doses of trans fats. The result was trans fats accumulation in the heart, liver and kidney in place of natural cis-fatty acid. Moreover, the over-consumption of Trans fat also affected the metabolism of essential fatty acid in the newborn rats.

This study and research seems to be a clear indication that lactating mothers should reduce their intake of trans fats.

Trans fats and Newborn Babies

Trans fats may affect the fetus because everything that a pregnant woman consumes goes to the blood and then goes to the fetus. Trans fatty acids may prevent infants from absorbing the vital polyunsaturated fatty like the Docosahexaenoic Acid (DHA), an omega-3 fatty acid, essential for development of an infant's brain. This DHA is very important in the first few months of the infant's life and for other fetal development. Trans fatty acids may hamper the DHA in the race against tissue incorporation and hinder the essential fatty acid metabolism.

However, if a person stops eating Trans fats from a given date, it will still take about two years for the leftovers to be cleared by the body tissues. Therefore, women who are planning a baby should avoid dietary trans fats.

A German study found a correlation between dietary trans-fatty acids by mothers and low birth weight in infants. Another study also says that babies born with high-level of Trans fats have low-levels of omega 3 fatty acids.

Trans Fats and Breast-feeding Mothers

Research by Sheila M. Innis and D. Janette King suggests trans fatty acids in human milk have an inverse association with concentration of cis n-6 and n-3 fatty acids, and not with n-6 and n-3 fatty acids in plasma lipids of breast-fed infants. Other research also says that trans fats consumed by lactating mothers reduces the fat content of the milk.

Omega-3 and Omega-6 are vital fatty acids that are necessary for the fetus and the infant tissues development. These especially are essential for the brain and the nervous system of the infant. The effect on Omega-3 may hamper development of parts of the brain, which could result in lower learning ability and also affect the mood, perception and the visual ability of the child.

Therefore, if you are planning for a baby, you must be ready for the responsibilities as well.

Why not take the responsibility of giving your baby a healthy future too; eat healthy and live healthy!

13. Trans Fats, Alzheimer Disease and Cognitive Decline

A study of Neurology in 2003 showed that consumption of both trans fats and saturated fats increased the chances of Alzheimer disease. This disease is a serious form of dementia in which people of middle and older ages gradually lose their memory, identity, personality and, ultimately, their lives.

A study conducted by Martha Clare Morris et al, for "*Dietary Fats and the Risk of Incident Alzheimer Disease*", was based on a random sample of 815 people of 65 years and above in age that the Alzheimer's disease had not affected. The study showed a suggestion of a strong relationship between dietary consumption of fats and development of Alzheimer's disease. There was an increased rate of risk of Alzheimer's disease on consumption of trans fats and saturated fats.

On the other hand, the consumption of polyunsaturated and monounsaturated fats from vegetable appeared to reduce the risk.

The strongest indications were about Trans fats. Around 80 percent of people consuming trans fats had the chance of developing the Alzheimer's disease four times higher than the remaining 20 percent. In the case of saturated fats, there was a similar, but weaker effect. The top 80 percent had a 2.5 times higher chance of developing the Alzheimer's disease.

With the consumption of omega-6 polyunsaturated fat and monounsaturated fats of vegetable origin, the 20 percent with the least consumption of unsaturated vegetable fats had stronger chances of developing the Alzheimer's disease than the 20 percent with the greatest intake. The risk in this condition was 5 percent more.

So, a person with high intake of dietary trans fat and a low intake of polyunsaturated fat was found to have nine times more risk of developing Alzheimer's disease.

A further study also carried out by Martha Clare Morris et al, found similar effects in cognitive ability in the people over the age of 65. The study revealed that the increased intake of Trans fats and saturated fats led to a decline in cognitive function over six years.

Association of the trans fats consumption and decline of cognitive functions became stronger in an analysis which eliminated persons whose fat intake changed in recent years or whose baseline cognitive scores were the lowest 15 percent. The study further into 'dietary intake of fatty acids and fish in relation to cognitive performance at middle age,' found that the omega-3 oils have a similar role as omega-6, in maintenance of cognitive function among the middle-aged and above people.

However, some studies say that high monounsaturated fatty acids intake protects against cognitive decline related with age. It shows the beneficial effect of dietary monounsaturates. It assumes that, as people grow older, their brain chemistry needs a larger quantity of monounsaturated fats as it may help to prevent degeneration.

14. Trans Fats Cause Essential Fatty Acids Deficiency

Essential fatty acids are those necessary fats that the human body cannot manufacture and that can come only through our diet. Omega-3 and Omega-6 are two types of polyunsaturated fatty acids that are essential for the human body.

Deficiency of Omega-3 in Our Diets

The modern western diet is full of omega-6 (linoleic acid) but is deficient of omega-3. The best source of omega-3 is cold water oily fish, such as herring and mackerel. However, these foods are diminishing from our diet today.

There is a short chain of omega-3 in walnuts, leafy vegetables, flaxseeds, and wheat germ. However, our brains and nerve cells need only long-chain forms for healthy functioning. Without the sufficient amount of other vitamins and minerals, conversion of omega-3 small chains to omega-3 long chains is difficult.

The Role of Trans Fats in Diets

Consumption of trans fats further delays the work of delta-6 (desaturase enzyme) which, along with elongation enzymes, converts short-chain omega-3 into long-chain.

However, there may be another hindrance by the trans fats that has not been confirmed yet. The body cannot distinguish between trans fats and omega-3. Therefore, when you consume trans fats, there will be deposition of twisted molecules in the hormones and the cell walls.

Deficiency of Omega-3 and Related Diseases

If you consume enough omega-3 a day but, at the same time, you consume Trans fats, your body will be deficient of properly formed long chain omega-3. Low levels of EPA and DHA are significant factors with

heart disease and strokes. They also make arthritis and allergies worsen. They promote insulin resistance, which may lead to a diabetic condition and may act as a catalyst to cancer. There are other shocking indications about the lack of omega-3, especially EPA leading to mental illness, such as clinical depression, postnatal depression and hyperactivity in children.

The Ratio of Omega-3 and Omega-6

With times, our food cycle has changed a lot. Our diet has shifted from the fundamentally adequate required ratio of omega-3 and omega-6. With modernization of the world, the necessary fatty acids have also started vanishing from our modern diet.

With the discovery of high-speed rollers, the wheat may be stripped of vital ingredients, leaving only the starch. The chemicals and other processes made extraction of oils from seeds much easier. These processes brought a dramatic change in the human diet. Processed foods may cause an imbalance in the essential fatty acids from our diet and concentrate one of the two. While the experts say it is not necessary to return to the traditional old habits of eating, balancing our diet is essential.

Trans fats are high in omega-6, and the major portion of our intake is trans fats today. The probability that people are consuming too much omega-6 compared to omega-3 is, in itself, a major point of concern.

Part-V: Unveiling the Secret of Food Labels

15. Nutrition Facts on Labels - What to Look For, What is the Right Serving?

When considering the Nutrition facts label, the first place to start is the right serving size and the number. There is a standard size that almost all packed food products follow. This is an easier approach to comparing similar foods.

Check out the serving size and the number of servings in the particular package. Then ask yourself, how many servings do I consume - one serving, ½ serving, or more? For example, if one serving of pasta and cheese equal to one cup, then the entire package could be two cups or more. That means the calories; the other nutrient numbers and the daily value percentage are also more.

What Should My Diet Consist of?

Check the nutrition label for vitamin A, vitamin C, calcium, and iron and dietary fiber.

Most American diets are deficient of fiber, vitamin A, vitamin C, calcium, and iron. Food that is rich with the ingredients mentioned above will increase your health and reduce your risk of many diseases. For example, the right amount of calcium in your diet will lessen your chances of osteoporosis, a condition that makes the bones gradually more brittle.

A diet that is high in dietary fiber promotes a healthy bowel function. On the other hand, a diet rich in fruits, vegetables, grains high in soluble fiber, low in saturated fat and cholesterol may help to prevent heart diseases.

Checking the Calorie Count

Calories are the measure of how much energy you can derive from a particular serving of the food. Many people consume more calories than their body actually requires. Find out many calories your body does need for your height weight and other specifications. If a nutritional facts label in

the package mentions 250 calories per serving, and you consume the entire packet, you might just be consuming around 500 calories or 750 calories. So, you must not forget that this 500 or 750 calories also probably has a large portion of fats.

Here is a general guide to calories you can refer to:

1) 40-calories or below it is considered as low.

2) 100-calories is supposed to be a moderate range.

3) 400-calories or more is high.

What is an Ideal Nutritional Value?

Eat different types of fruits. But, try to avoid having fruit juices. Include more dark green leafy vegetables in your diet; for example, broccoli or kale. Try to have more carrots, beans, pumpkins, lentils, etc.

Go for the low fat or fat-free milk. It is time that you take yogurt as the substitute for ice cream. Include at least 3 ounces of whole grain cereals in your diet everyday. Substitute lean meat and poultry for other meats in your diet.

16. Understanding the 'Daily Value'

Understanding Footnotes on Nutrition Facts Labels

DV's, or daily values, are the recommended levels of diet intake. If you note the * on the Nutrition Facts label in a package, it indicates that you should refer to the nutrition label.

This portion of the label has details about the food contents which tells you about the percentage DVs based on the 2,000-calorie diet.

For each nutrient, there is a daily value, a percentage DV and a piece of dietary advice. If you stick to this dietary advice, you may be safer as per recommendation of the health experts' upper or lower limits of nutrients list.

Upper and Lower Limits of Daily Value

Upper Limit means 'Eat Less Than'. The nutrients with upper limits list high on the chart, which means you must eat less than the Daily Value nutrient listed per day. For example, the DV for saturated fat is 20 gm. This means that the amount is 100 percent DV for this nutrient. Therefore, the dietary advice here would be eating less than 20 gm, or the 100 percent DV, for the day.

Lower Limit means 'Eat At least'. If you check the fiber list in the nutrient label, you may find an amount mentioned, for example 25 gm, which is 100 percent DV. It means that the recommendation is you eat at least 25 gm of dietary fiber per day.

Percent Daily Value

Like most people, you too may not be aware of how many calories you are consuming in a day. However, you can still use the percentageDV as the reference frame to check whether you consume more or less than the required calories. The percentageDV is based on the Daily Value for the key nutrients for a 2000-calorie daily diet.

The **percentageDV** helps you to find out if the serving for the food is high or low in nutrient value. However, you do not need to apply your mathematical skills here to do some calculations, because the label in the package does all the work for you.

The label clearly mentions the number of grams and milligrams by putting them on the same scale (0-100%DV). Each nutrient scales on 100 percent of the daily requirement of that nutrient per day as per the 2,000-calorie diet. This way, you can differentiate between a high and a low diet.

A Quick Guide to PercentageDV

1) 5%DV or less than that in your diet is low.

2) 20% DV or more than that in your diet is high.

Using the percentageDV Correctly

Comparisons: It is easy to make comparisons with percentage DV. You can make easy comparisons between one product and brand to a similar brand or product. However, be sure to match serving size per serving size. Mostly, the weight of each product will be similar.

Claims on Nutrient Content: You can easily differentiate between one claim and another. For example, 'reduced fat' and 'nonfat' or 'light'. You just need to compare the percentageDVs for the total fat contained in each food product.

Dietary Trade-Offs: The percentageDV can help you make dietary trade-offs with other foods, too. Just remember a healthy diet may mean that you give up the food of your choice completely. If the food you like is high in fat, then try to balance it with foods that are low in fats the rest of the day. However, the most important thing that I would like to suggest here is to check the intake of your favorite food and try to keep below 100 percentDV.

Nutrients with a percentageDV but No Weight Listed: Find out the percentage DV for calcium on food packages. A food mentioning 20 percent

DV means a lot of calcium to your daily total, while 5 percent DV or less is low.

Food experts advise that adults should consume 1,000 mg of calcium on average, daily. However, others, mostly adolescent girls, must consume 1,300 mg and postmenopausal women should consume 1,200 mg of calcium daily.

Be sure to check the label for calcium because you cannot just survive on assumptions.

The PercentageDV for Trans fats, Sugar and Proteins

It is essential for you to note that the trans fats, sugar, and protein do not list on percentageDV on the package labels. But, there should be a mention of percentageDV if the food claims to contain protein.

17. Tips to Spot Trans Fat in Foods

The foundation for your diet lies in the kind of food you choose and it all starts at the grocery store.

It is a big challenge to stand in the aisle of the store and decide the healthiest source among the array of foods. There is no number that will magically shoot up and identify the amount of trans fats you need to have in your diet. Just remember that the more fast food or packaged food you eat, the more trans fat you are consuming each day.

To reduce your tension to some extent, here are a few expert tips that may help you to learn about the food labels and making the right choice of products by correctly identifying the trans fats in foods.

The Right Way of Identifying Trans Fats

Try to decipher the label content as doing so you will solve half of your problems. Read the Nutrition Facts panel that is generally on the back of the pack.

Let us see what each line means:

1. If it reads fortified, enriched, added, extra or plus, this signifies that the nutrients, like minerals and fiber, are replaced by vitamins through processing. So, you should look for products that read 100% whole-wheat and high fiber, low sugar cereals, etc.

2. One trick that some food manufacturers play is by separating the components of the food. They just give a full description of the first component and hide the second part of the food ingredient. The second ingredients are often hydrogenated fat which may appears later in the product listing.

3. The food industry can often fool you by highlighting 'ONLY VEGETABLE OIL USED.' This can mean vegetable oil or hydrogenated oil. Also, avoid phrases like 'CHOLESTEROL FREE VEGETABLE OIL'. This is misleading as

vegetable oil can raise your body cholesterol if is hydrogenated or partially hydrogenated.

4. Fruit drink signifies that there is little or no real fruit at all in the fruit drink. The drink may be full of sugar. Look for labels in the products that read '100% fruit juice'.

5. Always look for products that read 'whole' before the grain. This would ensure that you are getting 100% whole-grain product. If the label reads 'Made with wheat, rye, or multigrain' this will mean that the product does not have substantial amount of whole grain in it.

6. Natural: If the label signifies that the finished product has some sort of chance of resembling anything natural, then read carefully.

The source could be natural but there may be doubts with the final product. Go for products that read, '100% Natural' and 'No Preservatives' and 'Certified Organically Grown.'

7. Trust the labels that read, 'Certified Organically Grown.' Labelling terms like 'organically grown', 'pesticide-free' and 'no artificial ingredients' are just promotional phrases to convince the customer. Take the time and read that label carefully for your health's sake.

8. 'Sugar-free' or 'fat-free' means that they are lower in calories. This could mean that the manufacturer has made some unhealthy compensation of the ingredients, which may not taste so good. But, this product may not have fewer calories.

9. One practice you must sincerely follow while picking up the right food is going through the ingredient-listing column. The present day Nutrition Facts label does not help identify the trans fats.

10. In the ingredient list, check to see if the hydrogenated oil lists in the first 3 or 4 ingredients. If it mentions them, then there is a lot of hydrogenated oil present in the product. This means that you should avoid that food.

11. When a label reads 0 gm trans fat per serving, you have to be careful that the food may contain around 0.49 gm of it per serving.

12. You must know that certain foods have trans fats in them; for example, cakes, cookies, crackers, pies, French fries, chips, candy, shortenings, etc.

13. Fruits and vegetables are foods that are naturally trans fat free.

18. Public Response and Regulation

Canada

One of the largest consumers of trans fats in the world is Canada. It has been required by Health Canada that food labels list the amount of trans fat in the nutrition facts section for most foods.

Denmark

The first country to introduce laws against the sale of foods containing trans fats was Denmark. A movement in March 2003 had effectively banned partially hydrogenated oils. Denmark is the only country where it is possible to eat far less than 1 gm of industrially-produced trans fats daily.

European Union

A scientific group was asked to produce an opinion on trans fats by the European Food Safety organization.

United Kingdom

By the end of the year 2007, the major retailers in U.K including Asda, Co-op, Boots, Iceland, Marks and Spencer, Tesco, Sainsbury's, and Waitrose aim to end adding trans fatty acids to their own products.

United States of America

Until 2006, one could not make out the presence or quantity of trans fats in food products. You could only come to know about the presence from the list of ingredients mentioned from the partially hydrogenated ingredients.

On July 11, 2003, the Food and Drug Administration (FDA) issued a regulation requiring manufacturers to list trans fat on the Nutrition Facts panel of foods and some dietary supplements. Some of the companies have volunteered to accept this new labeling rule but it became mandatory for others from January 1, 2006 while the companies had requested for the extension to be January 1, 2008.

According to this regulation, trans fat levels should be less than 0.5 grams per serving.

In May 2005, Tiburon, California was the first American city where all restaurants had volunteered to cook with trans fat-free oils.

In New York, heart disease being the primary cause of resident deaths, the city started a campaign to reduce the consumption of trans fats. When it was found that the voluntary program was unsuccessful, New York City's Board of Health asked for public comments on a proposal to ban artificial trans fats in the restaurants.

On December 19, 2006, State representative Peter Koutoujian filed the first state level legislation that restaurants preparing foods with trans fat should be banned.

Food Industry Response

There are major food chains which have volunteered them to remove or reduce trans fats in their products. However, some food chains that are not willing to do so have been targeted with legal action.

In May 2003, Kraft Foods agreed to find an alternate for the trans fat in the Oreo after a US nonprofit corporation, BanTransFats.com Inc, filed a lawsuit against the food manufacturer, in an attempt to force Kraft to remove trans fats from the Oreo cookie.

The Center for Science in the Public Interest sued KFC over its use of trans fats in fried foods. On October 30, 2006, KFC announced that it would swap the partially hydrogenated soybean oil it currently uses. However, its biscuits will still contain trans fat.

In June 2006, Wendy's announced plans to eliminate trans fats from 6,300 restaurants starting in the United States and Canada.

In January 2007, McDonald's announced they will begin phasing out the trans fats in their fries after years of testing and delays.

The Walt Disney Company will also begin to get rid of trans fats in meals at US theme parks by the end of 2007. By 2008, it intends to stop the use of trans fats in licensed or promotional products.

The US Government Position

The US Department of Agriculture (USDA), along with the U.S Department of Health and Human Services (HHS), issued Dietary Guidelines for Americans.

In March 2003, Denmark's Food Minister said that they consider public health above the industry's interests and they issued new regulations limiting the amount of trans fat in processed foods.

The American Heart Association position

In June 2006, the American Heart Association (AHA) issued its "2006 Diet and Lifestyle Recommendations." It recommended that our daily intake of trans fat should be limited to 1 percent of total calories, which equals roughly 2 to 2.5 grams of trans fat per day. They highly recommended that food manufacturers and restaurants should replace partially hydrogenated oils with low saturated fat alternatives.

Legal advisors and the county counsel of LA said to the public health officers say that, under their current State laws, it was not possible to ban trans fat. Nor can the restaurants be compelled to display nutritional information on their menus.

After this opinion, the Board of Supervisors had asked the department for a study on means to implement a trans fat ban.

Part-VI: Coping with Trans Fat

19. Choosing Healthier Foods

Developing a healthy eating habit is not a difficult task. It just needs a proper start. You need to remember to ensure variety which not only makes food interesting; it benefits the body with different nutritional contribution.

Here is a guide to help you in choosing healthier food.

Be a Smart Shopper

1. The first point for a smart shopper is to read labels. The Nutrition Facts panel in the food package can help you select foods that are low in saturated fat, trans fats and cholesterol. Check the nutrition label that shows vitamin A, vitamin C, calcium, iron and dietary fiber. In fact, these days, manufacturers do not always include all the detail on the Nutrition Facts panel.

2. Never go on a shopping spree on an empty stomach or you will end up selecting all the wrong stuff. If your children accompany you to the grocery store, give them a satisfying snack before you go. Never detour from your plan; stick to your shopping list.

3. When you purchase processed foods, choose the lower fat versions.

4. Add color to your diet; include lots of green, yellow and orange fruits and vegetables. They could be broccoli, carrots, cantaloupe, oranges or other citrus fruits. These foods have antioxidants and other necessary nutrients that will help you fight cancer and other diseases.

On the other hand, avoid added food dyes, unless from natural sources.

Follow the Pyramid Guideline

The perfect pyramid guideline makes you fill your food cart with a healthier diet. Plan your week's menu beforehand and fill your pantry with all the

required ingredients, this will save you from last minute runs to the grocery store. Change your menu every day.

Many people tend to eat the same kind of food everyday. Variety is the spice of life, so why not try variety on your plate too?

Make Fish a Part of Your Diet

Eat at least a portion of oily fish each week because fish is an excellent source of proteins and contain essential vitamins and minerals. They are also a rich source of omega-3 fatty acids, which are essential for a healthy heart. Salmon, trout, mackerel, herring, tuna, eel, etc., are rich sources of omega-3. You must not have much shark, swordfish, and marlin in a week as these may contain high levels of mercury.

Trans Fat-Free Tips

Here are some tips that you can use on an everyday basis to keep a check on your daily saturated fat, trans fat and cholesterol intake.

1. Choose foods that are low in saturated fat, trans fat and cholesterol. Keep in mind that, for fat and cholesterol, 5 percent of the Daily Value or less is “low” and 20 percent or more is “high". When it comes to trans fat, there is no Daily Value percentage.
2. Always go for alternative fats. Replace the saturated and trans fats with mono-unsaturated and poly-unsaturated fats. When consumed in moderation, these fats do not raise your cholesterol nor your LDL cholesterol level. Soybean oil, corn oil, sunflower oil and nuts are sources of polyunsaturated oil while olive oil and canola oil are sources of monounsaturated fat.
3. Prefer fish to meat as fish has lower saturated fat than meat. Fish such as mackerel, sardines and salmon are rich in omega-3 fatty acids, which is necessary for a healthy heart.
4. Select lean meat and poultry without the skin on. Avoid deep-fried lean meat such as beef or pork with visible fat.

5. When you are eating out or ordering your food in, make it a point to find out the kind of fat that was used for cooking.

6. Choose your food from those that are low in saturated fat or are fat-free. Have plenty of vegetables, whole grain food and fruits.

What Steps Can Parents Take?

1. Try new fruits and vegetables in your diet; plan some new kind of recipe where the food is not only healthy but interesting too.

2. Learn the art of identifying high fat and trans fat foods. They list under the fat category of the Nutrition Facts panel. Naturally low fat foods are fruits and vegetables, beans, whole-grains, chicken, turkey, fish, some cereals and bread. Smartly and innovatively, cook up some surprise so that your children ask for more.

3. Finally, you have to remember that you are accountable for the health of your children. It is your responsibility to provide quality food to them as children only eat whatever you provide or whatever food is available to them.

20. Alternatives to Trans Fats

Trans fats are not the only way to delicious foods, there are healthy alternatives that are equally delicious and are healthier than trans fat. However, our mission is, in part, convincing you that there are healthier and tastier substitutes. And, after all, nothing is more important than good health.

It is true that using alternatives to trans fats may mean paying some extra money. Nevertheless, I believe that a little extra from our pockets will not matter much where our health is concerned. The more people that stop purchasing the products that contain high levels of “trans fats” and other unhealthy foods to eat, the more the industry will respond positively to our buying habits.

There are shortenings and margarines prepared without Trans fatty acids. In fact, most of the food industry giants are health conscious and provide their customers with healthy alternatives. Ruby Tuesday and Frito-Lay, to name just two, have already quit the partially hydrogenated oils.

The fats from ruminant origin, mostly butter, cheese, beef, fat, mutton fat, have natural fats which come mostly from bacterial fermentation. These naturally occurring Trans fats have an altogether different isomeric profile than the ones that have an industrial origin. That is the reason they do not endanger health.

Here are a few healthy alternatives for trans fats:

Butter

The readily available alternative to margarine for your toast is butter. It is a healthy and nutritional alternative and a high quality food. In the recent past, there have been many health scares about saturated fats from animal origin. In addition, all those people who had switched to margarine have all been consuming some unhealthy components in their diet.

If you are checking your calorie count, then limiting your butter intake will make sense, as butter is a rich source of energy. However, do not forget that our body needs fats as an essential part of our diet and butter is definitely a good choice.

Butter contains some lauric acid, which is also present in coconut oil and mother's milk. This is a health-promoting fat.

Butterfat

Butterfat is the result of surplus EU butter. The water and the protein are removed to reach this form. It is a semi-hard fat and a good substitute for hydrogenated oil. A few well-known companies use this butterfat in their product as healthy alternatives. Nestlé is one of them. Nestlé uses butterfat in the Kit-Kat bars for filling the cream.

Coconut and Palm Oils

Coconut and palm oils are saturated vegetable fats, derivatives from the fruit of tropical trees. These are saturated fats and that is the reason that people often misinterpret them as unhealthy.

The saturated fats in palm oil have the quality to act like unsaturated vegetable fats, in terms of cholesterol levels and health qualities. However, coconut oil is a healthy alternative too. It is one of the healthiest existing fats.

Let us take a quick look at all the health-promoting qualities of coconut:

1. Coconut oil has a quality that makes it active against some bacteria and fungi, the pathogenic viruses.

2. It is a good source of lauric acid, the medium chain saturated fatty acid found in mother's milk. This fatty acid boosts the immune system.

3. Coconut oil consists of medium chain fatty acids, which does not convert to body fats. The body burns these fatty acids for energy.

4. They have a property that helps to protect the body against heart disease and cancer.

5. Coconut oil as a culinary oil is less fattening as it has the lowest energy content.

6. It has the property to help you to guard against wrinkles and premature aging.

7. Coconut oil has lots of antioxidants and anti-inflammatory qualities.

Fully Hydrogenated Oil

A fully hydrogenated vegetable oil is an oil which is converted into a fully saturated form. The presence of stearic acid in fully hydrogenated vegetable oil means that it assumes a solid form at room temperature. It does not contain trans fat, as only unsaturated fat can be trans. This is the reason it is comparatively harmless.

But, keep in mind that 'hydrogenated vegetable oil' does not itself mean it is fully hydrogenated.

The fully hydrogenated oil's texture, hardness and looks are like candle wax. Nevertheless, this is not the right choice of product for the food industry. However, a solution to this is to mix fully hydrogenated vegetable oil with completely unhydrogenated vegetable oil. This lends it a fluid, mechanical property. Neither of the two contains trans fat, and the result is the final product minus trans fat.

Traditional Liquid Vegetable Oils

The traditional sources for oil; canola or rapeseed, corn or soy are in fact very healthy alternatives to hydrogenated vegetable oil. In Italy and Spain, people use olive oil on their bread instead of butter. In Spain and Italy, using olive oil as salad dressing and frying is very common these days. In fact, it tastes good.

Some liquid vegetable oils themselves contain around 5 percent of trans fats; for example Soya, Rapeseed and Canola oils. This is due to the trans isomerization of alpha linolenic acid, in high temperature refining and other processes. These traditional liquid oils are a good choice for domestic culinary practices.

However, they do not cater to the need of the food industry. Food industries prefer long shelf lives, which comes from the chemical stability granted by the hydrogenated unsaturated vegetable oil. Hydrogenation is a process that stabilizes certain fatty acids present in vegetable oils that are capable of becoming rancid.

Animal Fat

Humans have been eating animal fats a very long time, our bodies have gotten used to them by now. This is an efficient way of taking in energy, provided we burn this energy through proper exercise and maintain proper body temperature.

Lard is mostly equal amounts of monounsaturated and saturated fatty acids, and it has a low amount of myristic acid. This is mainly associated with the cardiovascular disease. The higher the liquid content of the poultry fats, the higher chances of having saturated fat.

The hard animal fats; the beef and venison fat for example, contain a high portion of long chain saturates of stearic acid. These are neutral to cholesterol. All animal fats have palmitic acid, a saturated fat that raises the cholesterol level, but our bodies can convert the surplus carbohydrate in our diets to palmitic acid as storable energy. Therefore, robbing our body of palmitic acid will do little to lower the palmitic level, provided we eat a carbohydrate-rich diet.

Animal fats are rich in cholesterol, the infamous reason for causing heart disease. However, you must know that dietary cholesterol mildly correlates with blood serum cholesterol, which does not relate to tissue cholesterol or

the cholesterol plaque in the inner surface of the arteries, which is actually dangerous.

The arterial cholesterol plaque actually forms from oxidization, mostly due to the free radicals and in fact, saturated fats provide some protection against free radicals.

One more advantage of animal fats is their chemical stability, so their use in frying does not bring any significant deterioration in quality.

Liquid Oils from Advanced Oilseeds

If the food industry is dissatisfied due to the quality of the liquid oil from the advanced oil seeds, there are ways to help them. There is ample research about changing plants and seeds through selective breeding.

In the USA, soy oil is widely used and the soy breeders try their level best to produce seed with low linolenic acid content. There has been oil produced through selective breeding that satisfies the need of the food industry. Also, this oil has stability and a better shelf life without hydrogenation.

It also contains fatty acid that is beneficial to human health. This oil has good reviews and gives food an uplift of taste. It keeps fried food light and crispy, and has a good taste too.

21. Suggested Menu for Every Meal

Here are few tips to help you choose the right menu for a healthier you.

Base Your Meals on Starchy Foods

Starchy foods such as breads, cereals, rice, pasta and potatoes must be about a third of the food we eat. Eat wholegrain varieties instead of bland foods whenever you can as whole grains contain fiber, calcium, iron and vitamin B.

They will make us feel full for longer. Contrary to the popular belief, starchy foods are not thought to be fattening.

Eat Lots of Fruits and Vegetables

Try to include at least five portions of vegetables and fruits in your daily meals.

Your diet could be something like:

- ✓ a glass of fresh juice and half a banana along with your cereal at breakfast
- ✓ include lots of salad in your lunch
- ✓ Fruit, such as a pear or an apple, for your afternoon snack
- ✓ Your evening meal can include peas and other green vegetables

Consume More Fish

Our diet must include a portion of oily fish each week. Fish is a very good source of proteins and contains many vitamins and minerals.

Salmon, trout, mackerel, herring, tuna, sardines and eel are rich in omega-3 fatty acids. Omega-3 fatty acid is essential for a healthy heart. It is recommended that women should consume at least two portions of oily fish per week, where adult males should be consuming at the most four portion of fish in their weekly meals.

Reduce your intake of saturated fat and sugar

There are two kinds of fats:

Saturated fat: Having more of these can increase the cholesterol in the blood, which may lead to heart disease. Eat less meat pies, sausages, hard cheese, cakes and cream.

Unsaturated fat: Intake of unsaturated fat is better than having saturated fat as this lowers the blood cholesterol.

Sugar Intake in Our Diet

You must restrict the intake of excess sugar from cakes, sweets, biscuits, and fizzy drinks. Having too much of this stuff will cause tooth decay, especially if you have them between meals. Moreover, they are high in calories that can add to your weight.

The label of the food package always mentions the sugar content. If the label describes sucrose, glucose, fructose, maltose, corn syrup, honey or anything ending with an “ose” then you can be sure that this product is high in added sugar.

The Right Level of Sugar:

1) 10 gm sugar or more per 100 gm is a lot of sugar.

2) 2 gm sugar or less per 100 gm is low sugar.

Your salt intake should be no more than 6 gm a day

Keep a check on your daily salt intake. Too much salt daily can raise your blood pressure. People with high blood pressure are more likely to have heart disease or suffer a stroke.

Adults and children over 11 must consume no more than 6 gm of salt a day. Younger children should consume even less. We may eat too much salt without realizing it. For example, 75 percent of our salt intake probably comes from the processed food that we consume, such as cereals, soups, breads, biscuits, and ready-made meals.

Be Active and Maintain a Healthy Weight

Being underweight or overweight is not good. Overweight means higher susceptibility to diseases of the heart, high blood pressure or diabetes and being underweight may also be a health hazard. If you are concerned about your weight, consult your General Practitioner or a dietician.

If you are looking to lose weight, here are a few points for you:

1) Eat only as much as you need.

2) Eat a low-fat and low-sugar diet.

3) Eat plenty of fruits, vegetables, and whole grains.

4) Be active and indulge in some physical activities each day.

5) You need not join a gym to shed your extra weight. A brisk walk twice a day will do wonders.

Drink Plenty of Water

We must drink around 6 to 8 glasses (1.2 liters) of water or other fluids in a day to prevent dehydration. However, when the weather is hot or when we are very active, we may need more than this. Nevertheless, do not drink carbonated or caffeinated drinks.

Alcohol consumption must be limited as alcohol is high in calories. It does put on weight but heavy drinking tends to damage the liver. Women should have no more than 2 to 3 units per day. Men are advised not to exceed 3 to 4 units per day. It is said that a glass of beer per day may be good for you, as is wine. Any more than that, you are risking your destiny because of alcoholism, high blood sugar, misjudgment and other things that alcohol can do to you.

Do Not Skip Breakfast

Breakfast is the major source of the energy that we need to face the day. Your breakfast should include an assortment of vitamins and minerals. Many people believe that skipping breakfast will help them lose weight but

the potential disadvantages are great. Missing meals means missing essential nutrients. Researchers say that eating breakfast can actually help weight control. The reason behind this is, just because we skip breakfast, we tend to feel hungry before lunch and binge on high fat foods like chips, biscuits, etc.

22. Fats and Their Substitutes

We need fat in our diet because fats help us in nutrient absorption, nerve transmission and other important body functions. However, many of us do not know where to draw the line when it comes to fat consumption and we may have to face serious consequences.

The solution is to give our body the right kind and the proper amount of fat substitutes.

What are Fat Substitutes?

The ingredients that act like a 'good' fat in our diet are fat substitutes. We can divide fat substitutes into three categories based on the nutrient source. They are:

1) Carbohydrate-based fat substitute. These use plant polysaccharides in the place of fats.
2) Proteins and micro-particulated proteins are also excellent in replacing fats.
3) There are fat-based fat replacers that act as natural barriers and block fat absorption.

How is the Fat Substitute Used?

Fat substitutes reduce the quantity of fat in foods and assist people take in less fat. Many fat replacers are there to substitute the fat or the fat analogs from the food, while some fat replacers partially replace the fat and impart a similar taste to the 'bad' fat.

There is evidence that people who include fat substitutes have reduced calorie intake and improved their nutrient profile compared to the people who have not used a fat-modified product.

Are Fat Substitutes Safe and Helpful?

Fat modified products or fat substitutes are a recent introduction and affect only a few foods. The US Food and Drug Administration (FDA) claim these fat substitutes are safe but more research is being done and there is no claim about long-term benefits and safety.

It is always best to stick with natural foods.

Other Substitutes for Fats

1) Avoid cooking with oil that is high in saturated fats or Trans fats. Instead, use oils that are low in saturated fats and high in mono and polyunsaturated fats, such as canola oil, olive oil and flax seed oil.

2) Minimize the use of or avoid packaged foods that are meant for commercial use. They may be high in trans fats. Read the label and look for trans fat-free foods.

The Bad Fats vs. Good Fats

The Bad Fats

Saturated Fats: They raise total blood cholesterol as well as the LDL cholesterol (the bad cholesterol).

Trans Fats: Trans fats are of industrial origin. They are hydrogenated vegetable oils, invented for food production processing and to give a longer shelf life. Trans fatty acids form as a result of hydrogenation and are found in many commercially packaged food.

You may even find trans fats in popcorn, macaroni and cheese (the cheese part of the package).

The Good Fats

Monounsaturated Fats: These fats have lower cholesterol and LDL cholesterol and increase the HDL cholesterol (the good cholesterol). Some examples are nuts, canola and olive oils.

Polyunsaturated Fats: These fats have lower total cholesterol and LDL cholesterol. The foods that are high in polyunsaturated fats are seafood like salmon and fish oil, soy, corn, sunflower and safflower. Omega 3 fatty acids also belong to polyunsaturated fats group. Studies show that replacing 'bad' fats in your diet and enhancing it with omega-3 fatty acids may prevent blood from clotting and help in lowering high blood pressure. There is more research going on about the benefits of omega-3 fatty acids, but they are believed to be useful in helping to prevent some effects of Alzheimer's disease. Maintain a proper balance of your food intake.

23. How to Be a Smart Shopper

Cooking healthy meals is a big challenge and so is “shopping smart”.

Good nutrition means making the right choices in the grocery store and using the right ingredients in your kitchen.

But, in this fast paced world, life is so hectic that there is hardly any time for people to read the food labels carefully or to find out about nutritious food. They may end up with a ‘best buy’, but that might not be the healthiest choice for them.

A little guidance will definitely help you find your way to a healthier deal.

Always Plan

The process of being smart starts way before you head to the shop. Before you go to the grocery store, it is advisable that you plan your meals for the week. Then, create a list that you need to purchase.

This may take a few minutes, but it will definitely save you time that you would need to make a last minute dash for a missing ingredient.

You can save more if you are extra careful. For example, you can use coupons; check the weekly grocery ads or any money saving schemes. You can easily incorporate the foods on sale into your meal planning. One point to keep in mind here is to never go shopping on an empty stomach. This will only increase your impulse purchases and may not be healthy for you or your family.

The Pyramid Guideline

Try to meet the pyramid guideline by filling your food cart with more of fruits, vegetables, fish, lean meat, poultry, nuts and beans.

Try out something new for your daily meal. Some people eat the same kind of meal everyday. Food will be more interesting if there is variety on the

plate. If you cook white potatoes every day, why not try out sweet potatoes someday? Sweet potatoes are rich in beta-carotene.

Be Supermarket Savvy

Here a checklist to help you be a smart shopper and make healthy food choices in the supermarket:

Produce: Spend an ample time in the produce section. This is the first and largest section in the most grocery stores. Try all the colorful fruits and vegetables. These colorful vegetables and fruits will add necessary vitamins and minerals to your diet.

Breads and Cereals: Select foods that are less processed and have at least 4 grams of fiber per serving. Prefer whole-wheat bread, brown rice, pastas, grain mixes and barley.

Meat, Fish, and Poultry: The American Heart Association recommends that there should be two servings of fish in a week. Salmon can be a good choice as this is favored by many people and rich in omega-3 fatty acids.

Dairy: Dairy products are rich in calcium and vitamin-D.

Frozen Foods: Frozen fruits and vegetables are a nice way of making up for a lack of some produce in the off-season or when prices are very high.

Canned and Dried Foods: Keeping a variety of canned vegetables and fruits at home. Always choose vegetables that are free of salts. You can also keep tuna packed in water, low-fat soups, canola and olive oils and assorted vinegars in your pantry.

Part-VII: Frequently Asked Questions

24. Trans Fat FAQ

Here are answers to some frequently asked questions on trans fats to help you understand the trans fats better.

What is Dietary Fat?

Dietary fats are a vital part of a healthy diet. They are found in foods. Dietary fats may contain both saturated and unsaturated fatty acids.

What are Trans Fats?

Trans fats are hydrogenated oils. They are unsaturated fatty acids, processed through hydrogenation into a solid or a stable liquid. That means they contain hydrogen and are unsaturated.

Why Did Trans Fats Become Useful?

Food products have to meet commercial requirements; to have firm texture and a longer shelf life. In addition, the use of hydrogenated oils gives the food product consistency, freshness, desirable texture and quality in some cases. So, trans fats are desirable in the food industry.

Why is Trans Fat Now an Issue?

Trans fats are responsible for some increases in blood cholesterol, heart disease and other health conditions. These adverse effects of trans fat in people's health led to a common view that eliminating this form of fatty acids altogether from the diet completely would be good for general health.

Which Products Contains Trans Fats?

Trans fats are present in different amounts in various foods. Most food prepared in partially hydrogenated oils, such as baked products and fried foods plus some margarine products contain trans fats. Trans fats may be present in a very minimal amounts in dairy products, too.

How Much Trans Fat is Okay for a Diet?

The American Heart Association (AHA) suggests that a person should consume no more than 1 percent trans fats. The AHA further suggests that the fat intake should be no more than 30 percent of calories and saturated fat to no more than 7 percent of calories.

How can I Reduce My Intake of Trans Fat?

Here are some points that you can keep in mind to help you reduce your trans fats intake from your everyday diet.

1) When you reduce total fat from your diet, this will reduce your intake of saturated fat, trans fats and cholesterol.

2) Reducing trans fats does not mean that you substitute food higher in saturated fats for it.

Food Choices to Reduce intake of Saturated Fats and Trans Fats

1) You can cook your food in liquid vegetable oils, as most liquid vegetable oils are naturally low in saturated fats and are trans fat-free. For example; soybean, canola, sunflower, corn and olive oil.

2) There are new fat processing technologies that took the challenge and have successfully produced trans fat free products. Additional products are likely to be available in the future.

3) You can try reduced fat, low fat, fat-free and trans fat-free versions of foods.

How to Avoid Trans Fat?

1) Avoid foods that are deep-fried, especially fast foods.

2) Avoid manufactured food; for example, biscuits, cakes and pies with hydrogenated fats in them.

3) If you use a fake butter spread on your bread, find one with NO trans fats. Butter is safe to use in moderation.

Healthy Substitutes for Trans Fats?

The edible oil industry has created healthy substitutes, through alternative processing techniques and genetic alteration of plants. There have been successful efforts to make canola and soybeans into user-friendly oils.

Is Trans Fats Part of the Obesity Problem?

Obesity is mainly due to the imbalance in calorie intake. Trans fats make you fatter and also increases the fat around your belly. This is because trans fats accumulate near the belly, but also encourage the movement of fat from other parts of the body to the belly.

The Role of Trans Fats in Diets

Our body requires essential fatty acids, which come to the body only through our diet. Omega-3 and omega-6 are two types of fatty acids that our body requires. However, an imbalance in the eating pattern in today's world has increased the intake of omega-6 fatty acids only. In addition, the omega-3 we take in are often just the short chains of omega-3, but our body requires long chain of omega-3 for the healthy functioning of brain and nerve cells.

Our body has the capability of converting these short chains of omega-3 to long chains, with the help of delta-6 (desaturase enzyme). Consumption of trans fats in our diet delays the work of delta-6 in converting the short chain of omega-6 into the long chains.

Effects of Trans Fats, Saturated Fats and Dietary Cholesterol on Blood Cholesterol?

Research by the National Academy of Sciences Institute of Medicine says that trans fat, saturated fat and dietary cholesterol all raise blood LDL (Low-Density Lipoprotein) cholesterol, which is a the 'bad' cholesterol. They also say that there is evidence to indicate that our intake of trans fat lowers HDL (High-Density Lipoprotein), the good cholesterol.

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