

A Touch of Life

Health and Wellness Program

Fatty Acids

Week 5

FATTY ACIDS

The body cannot live without fatty acids. It depends on fatty acids to carry out many of the tasks needed on a daily basis. Fatty acids are instrumental in the production of hormones, cholesterol, mobilizing joints, maintaining the pressure in the eye, body tissue respiration, maintaining the balance of the immune system, dilating and distributing the pressure in the blood vessels, neurotransmission of the nervous system, maintenance of proper kidney function, preventing and protecting against cardiovascular disease, diabetes, cancer, autoimmune diseases, skin diseases, and chronic disease.

Fats whether oils, lards or waxes are members of the lipid family. Humans consume lipids (grease or fat) from animals, plants or microbial cells that are soluble in either ether or chloroform and not in water. Animal fat is saturated fat, where vegetable oil is a liquid polyunsaturated fat. Both are hydrocarbons comprised of hydrogen, carbon, oxygen, which are related to the petroleum atoms.

The hydrocarbon chain, which makes up the fatty acids, has three compounds known as Glycerol. These glycerols develop into a triglyceride or natural fat, which are broken down during digestion into free flowing fatty acids and at that point are able to be absorbed by the small intestine into the blood stream. After entering the blood, these triglycerides either work effectively to aid the body in maintaining health as healthy fats or they accumulate in the blood vessels obstructing the walls of the vessels and causing unhealthy conditions.

Fats are consumed as triglycerides, phospholipids, and sterols. Ninety-five percent of all the fat humans consume today are either saturated or unsaturated triglycerides. To determine whether a fatty acid is saturated or polyunsaturated depends on the amount of hydrogen atoms within the fat chain. When all of the atoms in the fat chain link are filled with hydrogen it is a saturated fat, on the other hand, the less hydrogen atoms in a fatty acid chain there are make it a polyunsaturated fatty acid.

Triglycerides are stored in the fatty tissues (adipose) and meet the bodies' needs for energy in between meals. When triglycerides are not immediately used after a meal they are converted to fat and stored in the adipose tissue at which point they can become excessive and turn into hypertriglyceridemia (insulin resistance and high levels of triglycerides in the blood). Triglycerides need the enzyme lipase to properly digest into the system and build the body. If for any reason the small intestine is unable to digest the triglyceride then it will show up in the blood stream in the form of low density lipoproteins (bad cholesterol).

Fats that are used or stored can also come from carbohydrates, which are first used for energy and then triglycerides. In many cases the accumulation of

triglycerides in the adipose tissues is the refined carbohydrates and simple sugars consumed. Whenever there is an accumulation of fat in the adipose tissues it is the onset of several disease including diabetes mellitus, high cholesterol, coronary artery disease, cardiovascular disease, hypertension and other disease.

Ninety percent of the 60 to 150 grams of lipids (fats) an adult consumes a day are triglycerides and the remainder is comprised of cholesterol, cholesteryl esters, phospholipids, and free fatty acids.

Most of the time when we hear about cholesterol it is negative because of its connection to cardiovascular disease, obesity and other unhealthy conditions. Cholesterol is a natural composition of all our body cell membranes, which means bile and strol hormone-like. It is steroid lipid internally manufactured by the liver (1,000 MG a day) or from foods consumed and transported throughout the circulating blood of all animals. When fatty acids are ingested they are converted to diglycerides and then to monoglycerides in order to be absorbed as free fatty acids. When absorbed the free fatty acids connect to and are transported by a special protein that becomes a lipoprotein. We know these lipoproteins as very low-density lipoproteins (VDL), low-density lipoproteins (LDL) or high-density lipoproteins (HDL). They are known for their cholesterol levels. The liver and gallbladder play a significant role in the ability of triglycerides digestion and absorption in the body because of the hormones they manufacture and secrete known as bile salts.

Cholesterol has its place not only in the blood plasma but 10% of the brains lipids are comprised of cholesterol. However, it can cause havoc when out of balance increasing the low-density lipoproteins (LDL) elevating cholesterol (bad) levels and endangering the body. Very low and low-density lipoproteins are what obstruct the arteries with plague resulting in heart attacks, strokes, hypertension and other degenerative diseases. On the other hand, high-density lipoproteins increase the flow of blood taking cholesterol back to the liver to be synthesized.

Cholesterol is a major part of the American's eating habit to the point where the average adult male consumes 337 milligrams and adult female consume 217 milligrams according to the American Heart Association. They also recommend that the daily intake of cholesterol is below 160 milligrams a day. It is suggested that persons who have cardiovascular disease or other vascular health conditions should not exceed 100 milligrams of cholesterol a day. LDL is mainly the product of saturated fatty acids that are consumed from meats, lards, butters, and margarines. Low-density lipoproteins can also come from eating foods with large amounts of carbohydrate in the form of refined sugars. According to the American Heart association your cholesterol level should be

There is a difference between Low Density Lipoproteins and High Density Lipoproteins (HDL). The protein to lipid ratio is higher in High Density Lipoproteins, which is good cholesterol that protects the heart, the arteries, and wards off potential heart attacks. As a matter of fact, many doctors think HDL's carry cholesterol away from the heart and back to the liver. Very Low Density and Low Density Proteins are comprised of more lipids than proteins, increasing their fat content.

Trans fatty acids are hydrogenated which interferer with the metabolic process and also impairs the livers and gallbladders ability to synthesize, secrete bile salts and convert high density lipoproteins into free fatty acid in order to be absorbed by the small intestine.

The National Cholesterol Education Program guidelines for triglycerides are:

Normal	Less than 150 mg/dL
Borderline-high	150 to 199 mg/dL
High	200 to 499 mg/dL
Very high	500 mg/dL or higher

These are based on fasting plasma triglyceride levels.

Phospholipids have a structure similar to triglycerides; however, they are different in they constituent because they are the primary matrix of the cell membrane, balancing the water and lipid interchange within the cell membrane.

Lecithin, which is a phosphatidyl choline, plays a major role in the balancing of phospholipids presents in cells. When a person eats healthy their liver will produce lecithin, which is the building block of cellular membranes. It is the primary substance that maintains the homeostasis of the cells. The brain and the brain stem comprise more lecithin then any other body part. Lecithin is also a fat emulsifier and has the ability to reduce cholesterol levels in the blood and blood vessels. It can also be taken as a supplement and is found in liquid and pill form in all health food stores and some major grocery stores. It is processed from either egg yokes or soybeans.