Chapter 25: What to Know

General Information

Lipids do not easily travel in the blood stream. They need to be grouped with other lipids in lipoproteins.

Lipoproteins are a combination of phospholipids, proteins, cholesterol, and cholesterol derivatives.

Digestion Pre Intestine

Fats are not broken down by enzymes in the mouth.

The stomach churns the fats into very small droplets.

This process takes time, so a person feels "full" for a longer time.

Stomach acids do **not** break the fats down.

Intestines

Enzymes are used to break the triacylglycerols into fatty acids, glycerol, monoacylglycerols, and diacylglycerols. In general the triacylglycerols are only partially broken down by the enzymes.

The enzymes are lipases and they originate in the pancreas.

Bile is needed in order for fats to be digested. Bile comes from the gall bladder,.

Bile emulsifies the fats and oils. The fats must be emulsified in order for the lipases to reach the triacylglycerols.

Water soluble fatty acids and glycerol are absorbed from the intestine into the blood stream.

The trip for insoluble lipids is not so simple. They must be wrapped up in soluble units and travel through the lymph system to the thoracic duct which is just below the collarbone.

The lipoproteins that carry these larger lipids are called chylomicrons.

Lipoproteins

Lipoproteins are grouped by composition and density

(chylomicrons, serum albumin, VLDL, IDL, LDL, HDL)

As already mentioned chylomicrons transport lipids that have been recently digested.

Serum albumin is a large protein that transports fatty acids.

The other 4 classes of lipoproteins are involved in transporting lipids to, or away from the liver.

Very-low-density lipoproteins (VLDL) – take triacylglycerols from the the liver to other parts of the body. (Very bad)

Low-density lipoproteins (LDL)- transportation of cholesterol from the liver to other parts of the body. (Bad)

Intermediate-density lipoproteins (IDL)- carry pieces of very low density lipoproteins back to the liver.

High-density lipoproteins (HDL)- transport cholesterol from dead or dying cells back to the liver. (Good)

HDL is generally called “good cholesterol”. LDL is generally called “bad cholesterol”.

HDL and LDL both contain cholesterol. The cholesterol in these is the same. What is different is the lipoprotein that they are held in.

High LDL is associated with heart disease, while high HDL is associated with lower risk of heart disease.

The ratio of total cholesterol to HDL is used to determine the heart attack risk.

High total cholesterol/HDL, greater than 5, is a cause for concern.