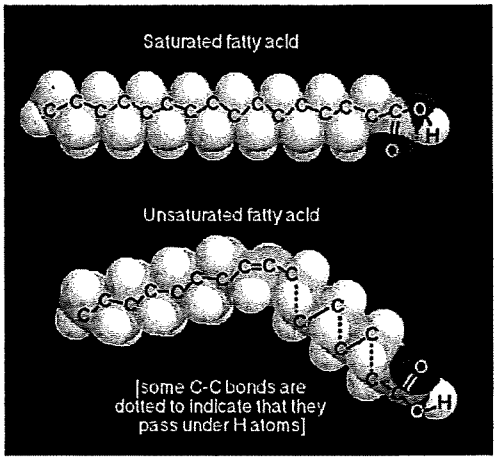
Fats an overview

Fats - eat lean
Anyone living in the UK who has not heard that eating a high fat diet is bad for you, must have been living in a box for the entire of their adult life. Approx 30% of our calories should come from fats in our diet.

Why is fat important in our diet?
- If provides a concentrated source of energy. 1 g of fat provides approx 9 calories (kcals) of energy
- It carries fat soluble vitamins A, D, E and K
- It contains essential fatty acids, required for many important body functions

The fats of life
There are two main types of fats: saturated and unsaturated. Unsaturated fats can be further broken down into Polyunsaturates and Monounsaturates. One group of Polyunsaturates are known as essential fats, in that our bodies need them to enable vital bodily functions. These fats are referred to as essential because they cannot be manufactured by our bodies, and therefore must be gained from our diet.

Saturated fat
Usually hard at room temperature and comes from animals (except for palm oil which is a saturated fat derived from coconut). Examples are butter, ha rd margarine (and some soft margarines which are especially hydrogenated for spreading) lard and all animal fats. An excess of saturated fat in a diet is linked to high cholesterol and coronary heart disease, as well as being a major contributor to overweight. When our fats are derived mainly from Saturated fat the effect will be to **increase harmful LDL Cholesterol.**



Unsaturated fats
Usually liquid at room temperature and comes from vegetables. Unsaturated fats break down further to mono-unsaturated and poly-unsaturated.

Polyunsaturated fats: found in cornflower oil, Sunflower oil, Soya oil and fish oil and some but not all margarines and spreads. Polyunsaturated fats are also the main fats found in fish and seafood. When our fats are derived mainly from Polyunsaturated fats the effect will be to **Lower total cholesterol (HDL & LDL).**

Monounsaturated fats: found in olive, rapeseed and sesame oil, and also in avocados. Some margarines and spreads are made from Monounsaturates. Monounsaturated fats do not lower blood cholesterol levels as much as polyunsaturates, but they are better at maintaining levels of "good" HDL Cholesterol. When our fats are derived mainly from Monounsaturated Fats the effect will be to **lower the harmful LDL & maintain levels of HDL ('good' cholesterol).**

How much fat?
The amount of fat that we should aim to eat in our diets should provide approximately 30% of the entire calorie content of the food that we eat. During weight loss, we should aim to decrease this to no more than 25% of total calories.

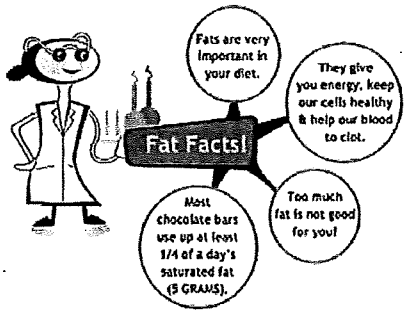
At present most people in the UK take in approximately 42% of calories in fat. Remember that our bodies are very efficient at absorbing fat, and 95% of all fat that we eat is absorbed.

Over 60% of our fat intake comes from dairy products, meats and margarine or butter. Up to 50% of these fats are higher in saturated fat (derived from animals) and these are the fats that we need to concentrate on lowering.

- Select the leanest meat that you can afford, and always trim the fat off meat cuts
- Always drain and discard the fats from joints, don't use as stock or for gravy
- Be aware of the food labels on processed foods that you eat regularly
- Start to use less margarines and spreads – scrape don't spread

Why do we like fat rich foods?

Our taste for fat comes from our ancestors, whose lives typically revolved around the availability of food in relation to the seasons. When food was plentiful in the summer months pre-modern man would gorge himself to fatten up for the leaner winter months, rather like many animals still do today, following a kill dominant carnivorous animals will automatically always go for the liver and offal, or organs such as the heart and kidneys which are surrounded by fat, subsequently they are very calorie dense and the prize of the kill.



As fat has the benefit of having over twice the calories of other fuels, and is more readily stored as fat reserves, then this would always tend to be the food of choice where seasonal variations in food availability are the norm. Homo sapiens have for one million years been subject to varying availability of foods, and so it is no surprise that our instincts are to drive us towards calorie dense foods of which fat is at the top of the list.

Fat is more satisfying

When fat rich food enters the stomach, it is churned into an emulsion, which allows the digestive enzymes in the duodenum to act more readily on fats once they are delivered. However large quantities of fat can overwhelm the digestive system and so at the bottom of the stomach a control valve known as the pyloric sphincter regulates the flow of fat to the duodenum allowing for gradual absorption. Therefore fat rich foods stay in the stomach much longer, and tend to leave a feeling of fullness (satiating effect) over a much longer period of time.

Study the fats around your kitchen (Cooking oils, margarines, spreads) and try to work out which group of fats they are from, and how much of each fat type they have.
This week try to select the leanest cuts that you can afford, and always trim away excess fat (remove the skin from poultry before cooking where possible). Be aware of the food labels on processed foods that you eat regularly. Check out the fat content of snacks that you eat regularly. Cut down on crisps, chocolate, cakes, biscuits and other high fat snacks or choose low fat versions.

Cholesterol

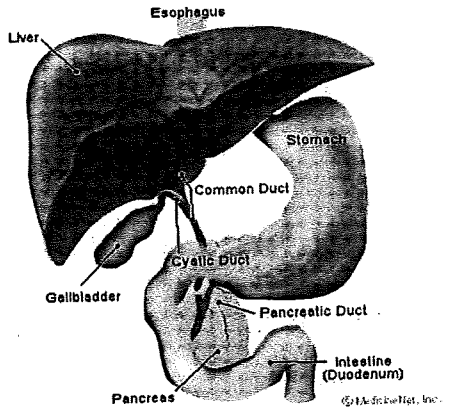
What is it?
Cholesterol is a fatty or waxy substance, which is mainly made in the liver from the saturated fats in food. Bile contains high levels of cholesterol, which is necessary for fat absorption.
Cholesterol plays a vital role in the functioning of every cell wall throughout the body. It is also the material that the body uses to make the hormones oestrogen and testosterone and other vital chemicals and vitamins such as Vitamin D.

Cholesterol is transported around the body in the blood stream, attached to what are known as lipoproteins. As their name would suggest, they are a combination of fats and proteins. It is this process of transportation around the vascular system that can lead to problems of fatty deposits on arterial walls (atherosclerosis) particularly where high blood cholesterol levels (Hypercholesterolaemia) are present.

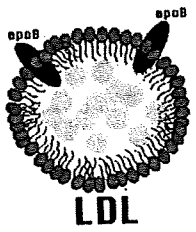
There are two main forms of lipoproteins.
- Low density lipoproteins (LDL), which carry cholesterol from the liver to the cells.
- High density lipoproteins (HDL), which return excess cholesterol to the liver.

How cholesterol is carried around the body

Production of cholesterol is increased by a high saturated fat diet and inherited factors.

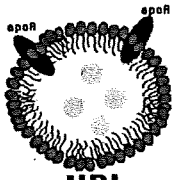


If there is a high level of cholesterol in the blood the artery wall takes up too much LDL. The risks of this happening are greater if you smoke or have high blood pressure, as this will damage the walls of the arteries.

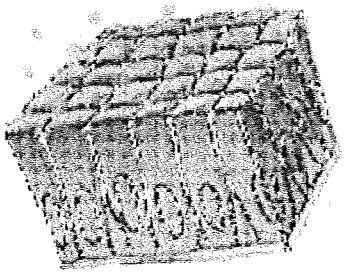


LDL

The Liver packages the cholesterol in LDL vesicles so it can be transported around the body and delivered to the tissues. The HDL vesicles collect any stray cholesterol in the blood stream and return it to the liver to be repackaged.



HDL

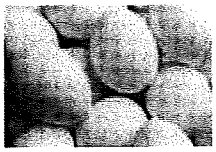


The cells, which need cholesterol, Regulate the amount of cholesterol removed from the blood circulation. In people with familial hyper-cholesterolaemia, the cholesterol is removed at a much slower rate.

Atheroma develops when LDL cholesterol in the blood undergoes a chemical process known as 'oxidation' and is taken up by cells in the coronary artery walls where the narrowing process begins. This can be caused through many reasons, however the most commonly known is the damage caused to LDL cholesterol by free radicals circulating in the blood stream, introduced normally from poor diet, smoking, alcohol etc.

HDL cholesterol removes cholesterol from the circulation, and appears to protect against coronary heart disease. It is important to note that HDL is effective at removing undamaged LDL, but not so effective at removing damaged atheroma forming oxidised LDL. The ratio of HDL to LDL is therefore very important and the goal is to lower the level of LDL and a raise the level of HDL.

What causes high blood cholesterol?
Around 20% of our cholesterol is found in our foods (dietary cholesterol), such as eggs, which contains the most, though offal such as liver and kidneys do contain some cholesterol. Although there is no evidence to suggest that by eating eggs for instance, this will increase cholesterol levels. The most common cause of high blood cholesterol in people in the UK is too much fat in the diet; particularly saturated fat. Some people have high cholesterol levels as a result of an under-active thyroid gland, or chronic renal (kidney) failure, or alcohol abuse. Also, 1 in 500 people have high cholesterol levels because of the inherited disorder familial hyperlipidaemia.



Cholesterol Lowering Lifestyle Steps

Reduce Saturated Fat - The level of cholesterol in the blood tends to rise, with the amount of saturated fats eaten. However, it is the negative impact of a high saturated fat diet on the ability of HDL to effectively remove LDL that is significant. As part of a healthy diet, it is therefore important to reduce the total amount of fat eaten, and to eat unsaturated instead of saturated fats.

How can physical activity help improve cholesterol levels? - Physical activity increases the level of HDL cholesterol (the protective cholesterol), but does not affect LDL cholesterol. Regular daily physical activity - such as brisk walking, swimming or cycling – plays a major role in reducing cholesterol levels. The optimum level of activity is 30 minutes of moderate to vigorous activity every day, or a minimum of five days a week.

Fibre - Dietary fiber has a strong cholesterol lowering effect, particularly soluble fibre. Fibre found in Oats, barley, pulses, nuts & seeds, beets berries, prunes, rye, fruit & Veg Soluble fibre is thought to "soak up" LDL cholesterol, whilst it is in solution in the digestive tract and then removes it from the body.

Cholesterol friendly foods
Wholemeal foods, grains, pasta, rice, vegetables fruit, Soya beans and products, oat bran, and garlic have all been strongly linked with lowering cholesterol. Live yoghurt promotes vitamin K synthesis important in lowering LDL, Vitamin C is linked with lowering cholesterol, Omega 3 EFA's (fish oils) increase levels of HDL & reduce LDL and foods that act as anti-oxidants, fruits, vegetables, (phytochemicals) and bioflavonoids reduce the oxidation processes that act to make LDL cholesterol dangerous.

The British Hyperlipidaemia Association gives the following values for total cholesterol:

> 5.2 mmol/l	Optimum
5.2 – 6.2 mmol/l	Borderline high
> 6.2 mmol/l	High

This week consider three changes that you could incorporate into your diet that could improve your cholesterol ratio of HDL to total cholesterol.