

**Interesterified Fats** – Interesterification hardens oils, in a process similar to hydrogenation.

- Does not produce trans fats and will result in a fat rich in stearic acid.
- Produces molecules that do not exist in nature and chemical residues, hexanes, and other hazardous waste products full of free radicals that can cause cell damage.

**Butter** – Generally contains 80% fat (52 to 65% saturated fat), less than 20% water.

- Naturally made by churning the fatty portion of cow's milk until it turns butter.
- Contains the fat-soluble vitamins A, D, E & K & other essential nutrients.
- Has a good ratio of omega-3 to omega-6 essential fatty acids.

**Margarine** – Contain 80% fat and < 20% water from milk fat and/or vegetable oil.

- Heavily processed from refined unsaturated vegetable oils like safflower oil, along with emulsifiers and various artificial ingredients.
- Hydrogenation or Interesterification gives it a harder consistency and extends shelf life.
- Typical soft tub margarine contains 10% to 20% of saturated fat.

**Spreads** – Generally less than 60% fat, up to 40% water generally made from vegetable oil.

- Manufactured by heavy chemical processing with stabilizers, emulsifiers, thickeners and preservatives and are combined with a hard oil, such as palm oil high in saturates.
- Vitamins, Stanols and Sterols are often added as a selling point.
- Most margarines & spreads are high in omega-6s, which are pro-inflammatory.

## The Bottom Line:

We know that trans and hydrogenated fats are bad for our health, but new research suggests that saturated fat is not only important, but can actually be good for us. Most margarines and spreads are heavily processed and are high in pro-inflammatory omega-6's, whereas butter has a much better nutritional profile. So, when eating fats it's yes to Omega 3, sometimes for Omega 6, a little for Saturates and NO to the man-made and unnatural fats.



# FOOD *in* FOCUS

## FATS

**Welcome to Vacherin's food in focus.**

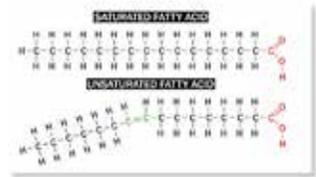
Each month our nutritionist Gary Baverstock will provide some basic science and will help to demystify certain foods in our diet.

## Fats

- There are many types of dietary fats (lipids) present in foods.
- Lipids are a group of naturally occurring molecules that include fats, waxes, sterols, fat-soluble vitamins (A, D, E & K), mono & diglycerides, phospholipids & triglycerides (the most abundant, which make up 90–95% of fats found in our foods).
- The main biological functions of lipids include storing energy, signalling and acting as structural components of cell membranes – such as saturated fats.
- Play an important role in regulating a range of metabolic and physiological processes.
- Certain fats, such as omega 3, have therapeutic anti-inflammatory effects, which can help prevent or reverse a number of chronic diseases.

## Classification of Fatty Acids

- Fats are a wide group of compounds whose basis is in organic acids called fatty acids i.e. made from long chains of carbon (C) and hydrogen (H) with one end comprising of a carboxylic acid group (Carbon, Oxygen & Hydrogen – COOH).



## The structure of Saturated and Unsaturated Fatty Acids

**Saturated Fatty Acids (SFAs)** – are those of varying length in which the carbon-carbon bonds are fully saturated with H atoms (see diagram)

- This makes it solid at room temperature – less useful for widespread use in the body.
- Stearic acid and Palmitic acid are the most common SFAs.
- Eating too much SFAs, except virgin coconut oils can raise blood cholesterol levels.
- **Dietary Sources** – beef, pork, lamb, cheese, butter, lard, palm oil, coconut oil etc.

**Mono-Unsaturated Fatty Acids (MUFAs)** – contain one double C bond (as seen), which creates a ‘bent’ fatty acid that ensures it is liquid at room temperature and pliable.

- Many health benefits in the body like helping to reduce LDL cholesterol.
- Oleic acid (C18) is the most common in foods and in the human body.
- **Dietary Sources** – olive oil, peanut oil, canola oil, almonds, avocados etc.

**Polyunsaturated Fatty Acids (PUFAs)** – contain at least 2 double C bonds.

- Two families, with different positions of first double bond (i.e. at Omega 3 or Omega 6):
- Alpha-linolenic acid (Omega-3) is an anti-inflammatory oil and is highly beneficial for the body: Sources – walnuts, flax seeds, hemp seed oil and canola oil.
- Linoleic acid (Omega-6) is a pro-inflammatory oil, which is important but less beneficial: Sources – some nuts, seed oils, poultry, cereals etc. Enough in diet.
- Long-chain PUFAs – Omega 3s found in fish oils (EPA and DHA) and Omega 6 PUFA arachidonic acid (AA) from dairy, foods and meats.
- The chemical structure of these fats make them very useful for organs like the brain.
- **Dietary Sources** – salmon, herring, mackerel, sardines, anchovies and fresh tuna

**Phospholipids** – make up a relatively small proportion of dietary lipids.

- A major component of cell membranes, creating the phospholipid bilayer.
- The most abundant (phosphatidyl-choline), also known as lecithin – choline is a precursor to acetylcholine, which is involved in memory and muscle function.
- **Dietary Sources** – Phospholipids occur in virtually all animal and vegetable foods.

**Sterols** – cholesterol produced by the liver in response to low cellular levels.

- Used in the formation and maintenance of cell membranes and sex hormones (progesterone, testosterone, estradiol, cortisol).
- Production of bile salts, which help to digest food.
- Conversion into vitamin D in the skin when exposed to sunlight.

**Hydrogenated Fats** – Hydrogenation adds additional pairs of H to fatty acids.

- It converts liquid vegetable oils into solid or semi-solid fats, like those in margarines.
- It reduces the double and triple bonds producing saturated fats.
- They are damaging to cardiovascular health.
- **Dietary Sources** – See Trans Fats

**Trans Fatty Acids** – Formed through partial hydrogenation of MUFA & PUFAs that are altered by either chemical processing or frying veg oils at high temperatures.

- They are present in a variety of processed and fried foods and are toxic, and are also damaging to cardiovascular health.
- **Dietary Sources** – crisps, French fries, fried foods, doughnuts, and partially hydrogenated oils in margarines, shortenings, cakes and biscuits.