## Introduction to fats and oils

Fats and oils are a major component of foods. Managing fat intake is important for controlling blood sugar levels. More importantly, fats and oils have been linked to serious diseases of the heart and blood vessels. Therefore, it is important to understand what makes up fats/oils and how they affect the body and blood sugar levels.

The building blocks of fats and oils are called fatty acids. These fatty acids are made up of atoms such as carbon, hydrogen, oxygen as well as carboxyl group (-COOH) which are bound together by bonds. The arrangement of these building blocks determines the types of fats and oils and if they will be good for the health or not.

- Types of fats and oils
    - **Saturated fats:** Saturated fats are made up of fatty acids that have single bond between the carbon atoms. This makes it easy for them to form a single line and pack together easily and in a very neat fashion. That is why it is easy for them to stay packed together to form solids at room temperature. Imagine tiny square blocks packed together to form a wall. As a rule of thumb, saturated fats/oils are solid at room temperature. There are both animal and plant sources of saturated fats. Animal sources include meat, milk, cheese, lard, butter etc. Plant sources include palm oil, palm kernel oil, coconut oil, butter, shea butter, cocoa butter.
    - **Hydrogenated/trans-fats:** Trans fats are another group of fats that are formed by adding hydrogen to vegetable oil to make it more solid at room temperature. It also makes the oils to last longer and taste better. This is called hydrogenation and it is done through an industrial process that leaves a product that is very unhealthy to the body. Examples of trans fats are; stick margarine and partially hydrogenated vegetable oils. Because they last longer and taste better than vegetable oils, trans fats are used in processed foods like cake, biscuits, pizza, ice creams, French fries
    - **Unsaturated fats:** Unsaturated fats are made up of unsaturated fatty acids which have double or triple bonds between the carbon atoms. So it makes them form chains that are bent or kinked. These chains cannot pack together in a straight line and in a neat fashion. They cannot form a solid block. As a rule of thumb, unsaturated fats do not form solids at room temperature. There are different types of unsaturated fats/oils. These are mono-unsaturated fats, poly-unsaturated fats and omega-3-fats.
        - **Mono-unsaturated fats:** they have fatty acids with one unsaturated double carbon bond. They are liquid at room temperature. Examples are olive oil, canola, avocado, melon/pumpkin, sesame oil etc
        - **Poly-unsaturated:** they have fatty acids with more than one unsaturated double carbon bond. They are also liquid at room temperate. They are found in fish oils, soy oil, flax seed, walnut, groundnut/peanut etc
        - **Omega 3 fatty acids:** These are a group of unsaturated fats that cannot be produced by the body. They have to be consumed from foods. Interestingly, only very few foods contain omega-3-fatty acids. They are mostly found in fish and plant sources such as flaxseed and walnuts. The main omega-3-

fatty acids are; Eicosapentaenoic acid (EPA), docosahexaenoic acid (DHA) and Alpha-linolenic acid (ALA)

- **Cholesterol:** Cholesterol is produced in the body by the liver and plays many useful functions in producing hormones and maintaining cell structure. However, cholesterol can be found in many foods including meat, eggs, fish etc. Eating large amounts of food with dietary cholesterol also clogs the heart and blood vessels.