

## NUTRIENTS

Humans require 7 groups of nutrients:

- |                 |            |
|-----------------|------------|
| 1)protein       | 5)vitamins |
| 2)lipids        | 6)minerals |
| 3)carbohydrates | 7)water    |
| 4)nucleic acids |            |

Macronutrients – things we require in large quantities: 1, 2, 3, 4, (7)

Micronutrients – things we require in small quantities: 5, 6

**Essential Nutrients:** required in one's diet (can't make these).

- e.g.: certain amino acids, most vitamins

**Non-essential Nutrients:** not required in one's diet (can make them)

- e.g.: certain amino acids, cholesterol

# 1. Carbohydrates

**Function:** main energy sources (especially glucose)

**Structure:** contain C, H and O (1:2:1 ratio)

## **Simple Carbohydrates:**

A) Monosaccharide – single sugar

glucose – most common

fructose – found in fruits

galactose – found in milk

B) Disaccharides – two sugars

- formed when water is removed

- glucose + glucose = maltose

- glucose + galactose = lactose

- glucose + fructose = sucrose

**Complex Carbohydrates - Polysaccharides** (many sugars)

- Starch - storage form of sugars for plants

- Cellulose - main source of fibre  
- part of cell walls

- Glycogen - storage form of glucose in animals

## 2. Lipids

**Function:** - an energy source (secondary)

- a storage form of excess nutrients
- insulate and protect body parts
- required to make hormones and other chemicals
- component of cell membranes
- aids in absorption of vitamins

**Structure:** - contain C, H and O in different ratios from carbohydrates

**Types:** 1) fats, oils and waxes

2) phospholipids

3) steroids

- most common is a **triglyceride** (1 **glycerol** and 3 **fatty acids**)

### **SATURATED**

- Contains maximum # of hydrogen atoms
- Solid/semi-solid at room temperature (e.g.: butter, margarine, Crisco, lard)
- Usually animal sources
- Reduced intake recommended

## UNSATURATED

- Some H atoms are missing and a double bond is present between some of carbon atoms
- Liquids at room temperature and from plants

### A) Monounsaturated

- “Best fats”
- e.g. olive oil

### B) Polyunsaturated

- “Good fats” - better than saturated fats
- Most plants contain mono/polyunsaturated fats
- e.g: corn oil, peanut oil

## 3. Proteins:

**Function:** - structural component (muscles, tendons, and cells)

- last resort for energy
- enzymes: catalysts for chemical reactions
- hormones

**Structure:** - contain C, H, O, N and sometimes S

- long chains of AMINO ACIDS linked by peptide bonds
- a chain >10 amino acids is a POLYPEPTIDE
- 20 amino acids (12 synthesized , 8 essential)