THE CHEMICAL STRUCTURES OF VITAMINS

Vitamins are the essential nutrients that our body needs in small amounts. More specifically, an organic compound is defined as a vitamin when it is required by an organism, but not synthesised by that organism in the required amounts (or at all). There are thirteen recognised vitamins.

**VITAMIN A**
- **RETINOL**
  - active form in mammalian tissues
  - Important for eyesight. Also strengthens immune system and keeps skin and linings of parts of the body healthy.

**VITAMIN B1**
- **THIAMIN**
  - can also occur in pyrophosphate ester form
  - Used to keep nerves & muscle tissue healthy. Also important for processing of carbohydrates and some proteins.

**VITAMIN B2**
- **RIBOFLAVIN**
  - excess turns urine bright yellow
  - Important for body growth, red blood cell production, and keeping the eyes healthy. Also helps processing of carbohydrates.

**VITAMIN B3**
- **NICOTINIC ACID**
  - can also occur in pyrophosphate ester
  - Helps with digestion and digestive system health. Also helps with the processing of carbohydrates.

**VITAMIN B5**
- **PANTOTHENIC ACID**
  - Important for manufacturing red blood cells and maintaining a healthy digestive system. Also helps process carbohydrates.

**VITAMIN B6**
- **PYRIDOXAL PHOSPHATE**
  - active form in mammalian tissues
  - Helps make some brain chemicals; needed for normal brain function. Also helps make red blood cells and immune system cells.

**VITAMIN B7**
- **BIOTIN**
  - produced by intestinal bacteria
  - Needed for metabolism of various compounds. Often recommended for strengthening hair, but evidence is variable.

**VITAMIN B9**
- **FOLIC ACID**
  - found as tetrahydrofolate in food
  - Important for brain function & mental health. Aids production of DNA & RNA. Important when tissues are growing quickly.

**VITAMIN B12**
- **COBALAMIN**
  - usually contains CN as the R group
  - Important for the nervous system, for making red blood cells, and helps in the production of DNA and RNA.

**VITAMIN C**
- **ASCORBIC ACID**
  - deficiency can cause scurvy
  - Important for a healthy immune system; helps produce collagen, used to make skin and other tissues. Also helps wound healing.

**VITAMIN D**
- **CHOLECALCIFEROL**
  - natural form; different form used in supplements
  - Important for bone health and maintaining the immune system function. May also have a preventative role in cancers.

**VITAMIN E**
- **ALPHA-TOCOPHEROL**
  - group includes tocopherols & tocotrienols
  - An antioxidant that helps prevent damage to cells and may have a preventative role in cancer. Also helps make red blood cells.

**VITAMIN K**
- **MENADIONE**
  - all K vitamins are menadione or derivatives
  - Helps blood clot properly, & plays a key role in bone health. Newborns receive vitamin K injections to prevent bleeding.

Key:
- **WATER SOLUBLE VITAMINS**
  - These vitamins are not stored in the body. As such, generally, they are required more frequently than the fat soluble vitamins.

- **FAT SOLUBLE VITAMINS**
  - These vitamins are stored in the liver and fatty tissues until required. As such, they can be harmful if too much is taken in.