Vitamins and Minerals

Vitamins:

Vitamins – organic compounds which means they contain carbon, essential for life

Either water soluble or fat soluble meaning they either need water or fat to be digested and absorbed.

Water soluble include (all are B-vitamins expect for vitamin C):

- Vit C
- Thiamin
- Riboflavin
- Niacin
- B6
- B12
- Folic acid
- Biotin
- Pantothenic acid

Fat soluble include:

- Vitamin A
- Vitamin D
- Vitamin E
- Vitamin K

Vitamin A

- Active form is retinal.
- Also found in inactive form, which is activated by the body. This form is carotene (i.e. beta carotene found in carrots)
- Vital for vision especially night vision
- Needed for repair of tissue and bone
- Involved in reproduction and fetal development
- Helps immune system function
- Food sources include – whole eggs, dairy, beef liver, dark green vegetables, yellow/orange colored vegetables

B-Vitamins

- Group of vitamins all involved in turning the food we eat into useable energy by the body
- Include thiamin, riboflavin, niacin, B6, B12, folic acid, biotin, pantothenic acid
- Some B vitamins work solely to turn the food we eat into useable energy. Others have additional roles
  - Thiamin (B1) assists the nervous system, heart muscle and regulates appetite
  - Riboflavin (B2) plays a role in mucous membrane formation and skin formation
  - B6 helps maintain normal homocysteine levels in the blood, which is an amino acid that helps reduce the risk of heart disease
  - Folic acid (B9) helps form brain and spinal cord during fetal development and is involved in cell division and red blood cell formation
- B vitamins are widespread in the food supply. Found mostly in green vegetables, meats, dairy and fortified foods
- B12 is the only B vitamin not found in plant foods and therefore needs to be supplemented for those who are vegan
Vitamin C
- Aka ascorbic acid
- Functions as antioxidant
- Assists formation of collagen
- Needed for wound healing
- Decreases risk of cancer and heart disease
- Found in fruits, vegetables especially citrus, bell peppers, kiwi, broccoli, strawberries, tomatoes, watermelon, potatoes, bananas and carrots

Vitamin D
- Known as the sunshine vitamin because we get most of what we need from sun exposure
- Needed for calcium absorption
- Helps maintain bones and teeth
- Prevents rickets and osteoporosis
- Assists in immune function, cell growth, fetal development
- Lately has been shown to reduce risks of some cancers
- Found in fatty fish, cod liver oil, dairy that has been fortified, egg yolks and beef liver

Vitamin E
- Acts as an antioxidant
- Contributes to immune function and DNA repair
- Sources include vegetable oil, nuts, beans, whole grains and fortified cereals

Vitamin K
- Plays an essential role in blood clotting
- Main source is green leafy vegetables, cabbage, beef liver
- Synthesized somewhat by the bacteria in the large intestine so we get some of what we need by our own body production

Minerals

Categorized as either major or trace dependent upon how much our body needs. Trace minerals are needed just as much for function but they are needed in much smaller amounts than major minerals.

Major minerals include:
- Calcium
- Phosphorus
- Potassium
- Sodium
- Chloride
- Magnesium
- Sulfur

Trace minerals include
- Iron
- Iodine
- Zinc
- Chromium

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• Selenium
• Fluoride
• Molybdenum
• Copper
• Manganese

Minerals are inorganic, they do not contain carbon. They are much more simple in structure than vitamins. Therefore they are much less vulnerable to damage from heat, light, cooking, processing etc. They can be bound to other substances, such as oxylates in spinach and tea and phytates in legumes and grains, making them unavailable for digestion by the body.

**Calcium**
- Involved in bone and teeth structure
- Aids in muscle contraction, blood clotting, blood vessel contraction and dilation
- Found in dairy foods, dark green vegetables, seaweeds, canned fish with edible bones, soy, sesame, almonds, fortified foods

**Fluoride**
- Plays role in bone health
- Prevents tooth decay and cavities
- Found in fortified tap water, tea and seafood
- Fortified toothpaste

**Iodine**
- Needed for thyroid function
- Found in iodized salt, seafood

**Iron**
- Needed for the formation of hemoglobin in the blood and myoglobin in muscle, both of which are oxygen carrying cells
- Sources include red meat, organ meats, fish, poultry, eggs, beans, lentils, green leafy vegetables, dried fruits, enriched grains
- We absorb animal form better than plant form. Vitamin C source improves absorption of plant form

**Magnesium**
- Assists in nerve and muscle function
- Regulates muscle contractions and blood clotting
- Maintains bones and teeth
- Helps prevent constipation
- Sources include green leafy vegetables, legumes, nuts, seeds, whole grains

**Phosphorus**
- Required for bone and tooth structure
- Part of DNA
- Found in most foods including animal and plant

**Potassium**
- Maintains water and electrolyte balance
- Helps control activities of heart, muscle and nervous system
- Present in almost all animal and plant foods
Selenium
- Functions as antioxidant
- Helps prevent some cancers
- Found in meat, chicken, fish, seafood, brazil nuts, grains, garlic, mushrooms

Sodium
- regulates water and electrolyte balance
- required for nerve and muscle activity
- maintains regular acid/base balance
- Found in table salt, soy sauce, milk products, sea vegetables

Zinc
- Assists in the activity of numerous enzymes
- Essential to immune function and wound healing
- Aids in DNA synthesis and reproduction
- Maintains sense of smell and taste
- Food sources include meat, poultry, seafood, eggs, dairy, whole grains, fortified cereals, and legumes