

Chains of carbon atoms form the backbone of the organic compounds necessary for all living organisms.

Nutrients

-are substances found in food or can be synthesized by the body.

Ex. Vitamin D produced by skin if deficient

- essential to normal body function
- lack of nutrients results in decline of health

6 Classes of Nutrients

- carbohydrates
- proteins
- lipids
- vitamins
- minerals
- water

Carbohydrates

- compound containing carbon, hydrogen, and oxygen most are sugars, starches, and dietary fibers.

Protein

- made up of amino acids (carbon, hydrogen, oxygen, nitrogen)
- contain the most easily used form of nitrogen

Lipids

- contains much carbon and hydrogen
- fats oils

Vitamins

- needed in small amounts to help regulate and support chemical reactions in the body

Minerals

- chemical elements used in body to promote chemical reactions and form body structures

Water

- body is composed of 60% water, essential to body functions

Functions of Nutrients

- provide energy
- promote growth and development
- regulate body pressure

Provide Energy

- carbohydrates
- proteins
- lipids

Promote growth and development

- proteins
- lipids
- vitamins
- minerals
- water

Regulate body processes

- proteins
- lipids
- vitamins
- minerals
- water

Enzyme

- a compound that speeds the rate of chemical process

Biological Regulation of Hunger

Hunger

- internal physiological drive to find and eat controlled by organs and central nervous system

Appetite

- external psychological influences that encourage us to eat

ex- viewing a tempting dessert

Satiety

- stops the desire to continue eating
- Hunger is controlled and regulated by the Hypothalamus** (in mammals)
- located in brain
- hormones initiate and halt desire to eat

Carbohydrates

- found in dairy products, cereals, breads, pasta, fruits and vegetables
- should generally constitute about 60% of your daily intake
- spare the body from using protein as a energy source
- provide energy for cells and muscle in the form of glycogen

Forms of Carbohydrates

- monosaccharides
- disaccharides (simples sugars)
- polysaccharides (starches)

Photosynthesis creates carbohydrates in plants

Monosaccharides

- single sugar forms
- glucose is the major monosaccharide found in body
- glucose is also knows as dextrose
- primary source of energy for cells
- fructose (fruit sugar) absorbed by small intestine and metabolized by liver. Most common is high-fructose corn syrup

Disaccharides

- formed when two monosaccharides combine
- most common forms are sucrose, lactose, and maltose

Sucrose

- forms when sugar glucose and fructose combine
- such as honey, brown sugar, sugarcane, beets, etc.
- animals do not produce sucrose
- significant amount of sucrose is obtained from (table sugar)

Lactose

- found in milk products
- some humans cannot produce the enzyme *lactase* in their small intestine. **Lactase** is needed to digest Lactose. This condition is known as lactose intolerance. Symptoms include: abdominal pain, vomiting and diarrhea.

Maltose

- formed when two glucose molecules join
- found in alcoholic beverages

Polysaccharides

- large complex carbohydrates referred to as starches
- 3000 or more glucose units
- found in grains, fruit and vegetables
- plants convert glucose into starch to store carbohydrates
- indigestible fiber is a form of a polysaccharide

Amylose

- large polysaccharide starch
- constitutes most of the starch found in vegetables, beans, rice, breads, and pasta

Glycogen

- starch produced by animals which is stored in liver and muscle tissue
- breaks down easy for energy use

Foods high in Carbohydrates

- table sugar
- honey
- jam
- jelly
- fruit
- baked potatoes

Foods lower in Carbohydrates

- most vegetables
- dry beans
- other legumes
- non-fat milk

Lipids

- collective term for fats and oils
- do not readily dissolve in water
- fatty acids, triglycerides, glycerol, phospholipids, and sterols

Fatty Acid

- simplest form of lipids
- each dietary fat is a complex mixture of different fatty acids
- 3 types of fatty acid, **saturated, monounsaturated , polyunsaturated**
- can be distinguished from another by the number of carbon bonds
- olive and canola oil are rich in Monounsaturated fats
- safflower oil is rich in polyunsaturated fats

Triglycerides

- most common form of lipid

Phospholipids

- many exist in the brain
- form cell membrane walls
- lecithin is a common type of phospholipids found in our cells and high amounts occur in eggs

Sterols

- complex lipid structure
- most familiar form is cholesterol
- cholesterol is used to form certain hormones and bile acids
- our bodies produce cholesterol

Food High in Lipids

- salad oils
- butter, margarine
- mayonnaise

Essential Fatty Acids

- fatty acids that must be present in diet to maintain health

Basic Cell Biology

Membrane

-Defines cell structure, made of double layer lipids

Cytoplasm

-The viscous semi liquid substance contained in the interior cell wall

Mitochondrion

-power plant of cell (organelle extracts energy from nutrients)

glucose----- mitochondrion-----converts to ATP

Adenosine triphosphate

-important molecule which provides energy throughout cell

Nucleus

-information center, contains chromosomes

Chromosomes

-contains genetic information made of intertwined strands of DNA

Deoxyribonucleic acid (DNA)

-long complex macromolecule consisting of two interconnected helical strands containing genetic material

Ribosome

- cell structure where protein synthesis occurs

Endoplasmic reticulum

-network of tubes that manufacture process and transport materials throughout cells

- 2 types of ER

Rough endoplasmic reticulum

-where ribosomes are located (site of protein synthesis)

Smooth endoplasmic reticulum

- no ribosomes
- synthesis of lipids

Lysosome

- the recycling center of the cell, breaks down waste and old organelles

Golgi bodies

- stores, packages and distributes proteins from the ER