

Lipids, Proteins, and Carbohydrates

Molecular Fuel and Building
Blocks

LET'S BEGIN WITH CARBOHYDRATES WHAT DO THEY DO?

They are the main source for the body to gain energy. They are our fuel!

They make up the cell wall in plants which allow them to grow tall, without this carbohydrate, a plant would be a mushy mess! This type of carbohydrate is called Cellulose.

CARBOHYDRATES

WHERE ARE THEY FOUND?

In plant foods- in the cell walls of plants --- in fruits, vegetables, peas, beans, SUGAR comes from a plant and so does FLOUR!
(pasta, potatoes, bread, candy, cookies)

Complex

Carbohydrates

FIBER

WHOLE GRAINS

STARCHES

PASTAS

BREADS

VEGETABLES



CARBOHYDRATES MADE UP OF...

Carbohydrates are chains
(polymers) made of monomers.
The most common monomer of

carbohydrates is...

GLUCOSE

C₆ H₁₂ O₆

CARBOHYDRATES AT THE ATOM LEVEL

Each carbohydrate is made up of...

Carbon, Hydrogen, and Oxygen

Like GLUCOSE

$C_6H_{12}O_6$

NOW ON TO PROTEINS

WHAT DO THEY DO?

They are the major structural molecules in living things for growth and repair : muscles, ligaments, tendons, bones, hair, skin, nails...IN FACT ALL CELL MEMBRANES have protein in them

They make up antibodies in the immune system

They make up enzymes for helping chemical reactions

They make up non-steroid hormones

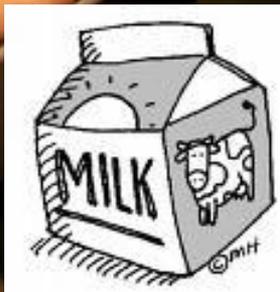
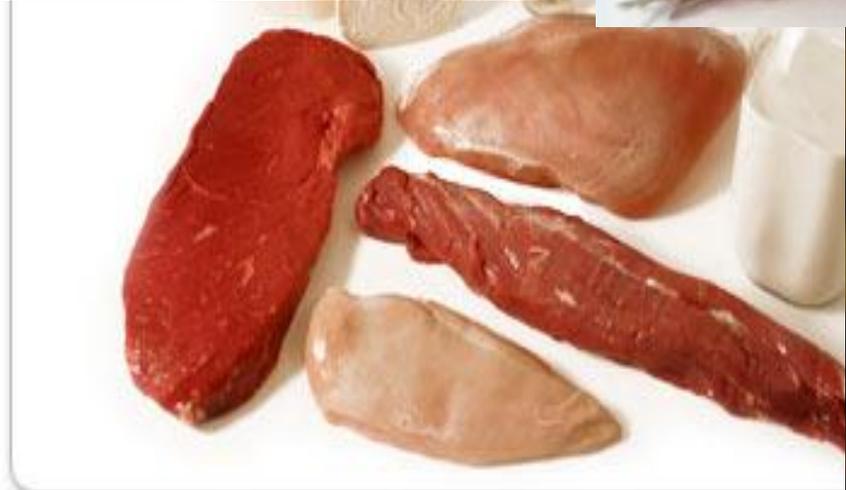
PROTEINS

WHERE ARE THEY FOUND?

In plant foods- in the cell membranes

In animal products- in the cell membranes- in the muscles of living things- cows, chicken,

Proteins



PROTEINS MADE UP OF...

Proteins are made of long chains (polymers) made of monomers. All proteins are made of the monomer...

AMINO ACID

PROTEINS AT THE ATOM LEVEL

Each protein is made up of...

Carbon, Hydrogen, and Oxygen,
Nitrogen and sometimes Sulfur

LIPIDS ARE NEXT

WHAT DO THEY DO?

They are a great source of STORED ENERGY so we have it in the future.

They INSULATE the body to maintain normal body temperature and they CUSHION the internal organs for protection.

They produce hormones for the body called STERoiDS

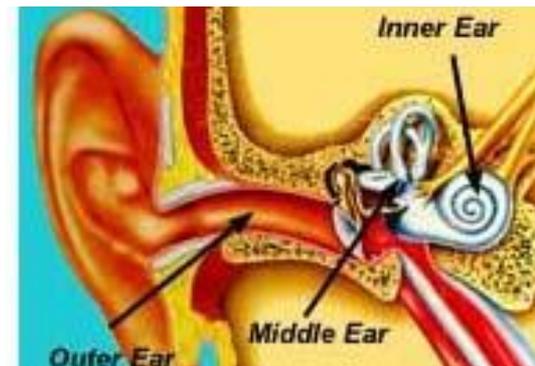
They waterproof surfaces of animals, plants, and fruits-
these are waxes!

LIPIDS...Some

interesting info

Waterproofing...

- Fruits produce a waxy coating to keep from drying out.
- The cells in a tulip make a wax which helps coat the leaves.
- Ear wax traps dust, sand, and other foreign particles from going deeper into the ear and causing damage.
- Beeswax- a structural material to hold honey in the hive



LIPIDS

WHERE ARE THEY FOUND?

In plants- in the seeds

In animals- in adipose tissue, connective tissue, in animals

Lipids make up the cell membrane of all cells.

LIPIDS

OILS BUTTER MARGARINE



LIPIDS MADE UP OF...

Lipids are chains (polymers) made of monomers. The most common monomer of lipids is...

TRIGLYCERIDES

LIPIDS AT THE ATOM LEVEL

Each carbohydrate is made up of...

Carbon, Hydrogen, and Oxygen

OH NO CHO!

Lipids like Carbs?

You might have noticed that both carbohydrates and lipids have the elements Carbon, Hydrogen, and Oxygen.

“CHO”

A carbohydrate, has twice as many hydrogen atoms as the number of oxygen atoms.



(This is a carb= there are double the number of H compared to O)

On the other hand, lipids have a lot more than twice the amount hydrogen atoms as the number of oxygen atoms.



Vocabulary you need to know!

Monomer- a molecule that can be bonded to other identical molecules to form a polymer

Polymer- a substance that has a molecular structure consisting chiefly or entirely of a large number of similar units bonded together, e.g., many synthetic organic materials used as plastics and resins