CARBOHYDRATES

Carbohydrates are the sugars, starches and fibers found in fruits, grains, vegetables and milk products. They are called carbohydrates because at the chemical level, they contain carbon, hydrogen and oxygen.

NUTRITION FACTS

Serving size 1 Large Apple

Amount Per Serving

Calories 130 Calories from Fat 0

Total Fat 0g

- Saturated Fat 0g
- Trans Fat 0g

Cholesterol 0g

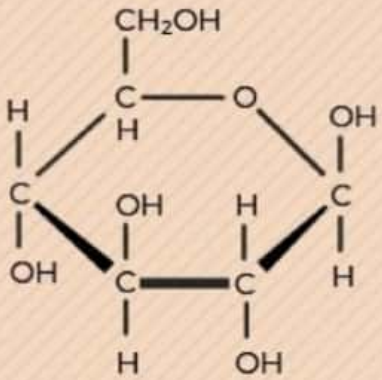
Sodium 0g

Total Carbohydrate 34g

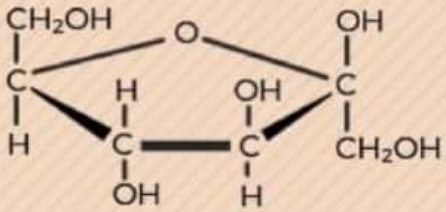
- Dietary Fiber 5g
- Sugars 5g

Protein 1g

GLUCOSE



FRUCTOSE



SIMPLE CARBOHYDRATES

Sources of Carboydrates

- Fruits
- Candy
- Milk
- Sugary Beverages

CARBOHYDRATES BENEFITS

- Mental health
- Weight loss
- Good source of nutrients
- Heart health

COMPLEX CARBOHYDRATES

Grains: Grains are good source of fiber, as well as potassium, magnesium and selenium. Choose less processed, whole grains such as quinoa, buckwheat, and whole-wheat pasta.

Fiber-Rich Fruits: Such as apples, berries, and bananas (avoid canned fruit, as they usually contain added syrup).

Fiber-Rich Vegetables: Eat more of all your veggies, including broccoli, leafy greens, and carrots.

Beans: Aside from fiber, these are good sources of folate, iron, and potassium.

FUNCTION OF CARBOHYDRATES

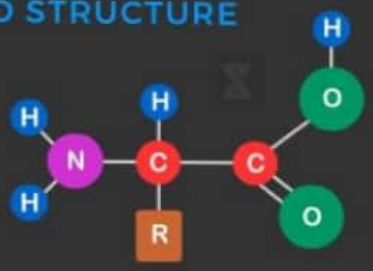
Carbohydrates provide fuel for the central nervous system and energy for working muscles. They also prevent protein from being used as an energy source and enable fat metabolism.

Part-1

AMINO ACIDS

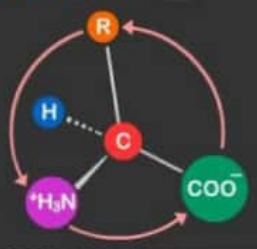
GENERAL AMINO ACID STRUCTURE

At physiological condition, the head group is postively charged and the tail group is negatively charged.



AMINO ACID STEREOCHEMISTRY

Most natural amino acids have the S or L stereochemistry about the α carbon. Notice the direction of the arrows from the highest atomic number atoms to the lowest. This is the same direction as when you would write the top part of the letter S or the direction that you would write an L.



PERIODIC CHART OF AMINO ACIDS

Basic | Non-Polar (hydrophobic) | Polar, Uncharged | Acidic

H 155.16 $C_6H_9N_3O_2$ **His** 137.14 Histidine	F 165.19 $C_9H_{11}NO_2$ **Phe** 147.18 Phenylalanine	A 89.09 $C_3H_7NO_2$ **Ala** 71.08 Alanine	C 121.16 $C_3H_7NO_2S$ **Cys** 103.14 Cysteine	G 75.07 $C_2H_5NO_2$ **Gly** 57.07 Glycine	Q 146.15 $C_5H_{10}N_2O_3$ **Gln** 128.15 Glutamine	D 133.10 $C_4H_7NO_4$ **Asp** 115.09 Aspartic Acid
R 174.20 $C_6H_{14}N_4O_2$ **Arg** 156.19 Arginine	L 131.18 $C_6H_{13}NO_2$ **Leu** 113.16 Leucine	M 149.21 $C_5H_{11}NO_2S$ **Met** 131.20 Methionine	N 132.12 $C_4H_8N_2O_3$ **Asn** 114.10 Asparagine	S 105.09 $C_3H_7NO_3$ **Ser** 87.08 Serine	Y 181.19 $C_9H_{11}NO_3$ **Tyr** 163.17 Tyrosine	E 147.13 $C_5H_9NO_4$ **Glu** 129.11 Glutamic Acid
K 146.19 $C_6H_{14}N_2O_2$ **Lys** 128.17 Lysine	W 204.23 $C_{11}H_{12}N_2O_2$ **Trp** 186.21 Trytophan	P 115.13 $C_5H_9NO_2$ **Pro** 97.12 Proline	V 117.15 $C_5H_{11}NO_2$ **Val** 99.13 Valine			T 119.12 $C_4H_9NO_2$ **Thr** 101.10 Threonine
I 131.18 $C_6H_{13}NO_2$ **Ile** 113.16 Isoleucine						

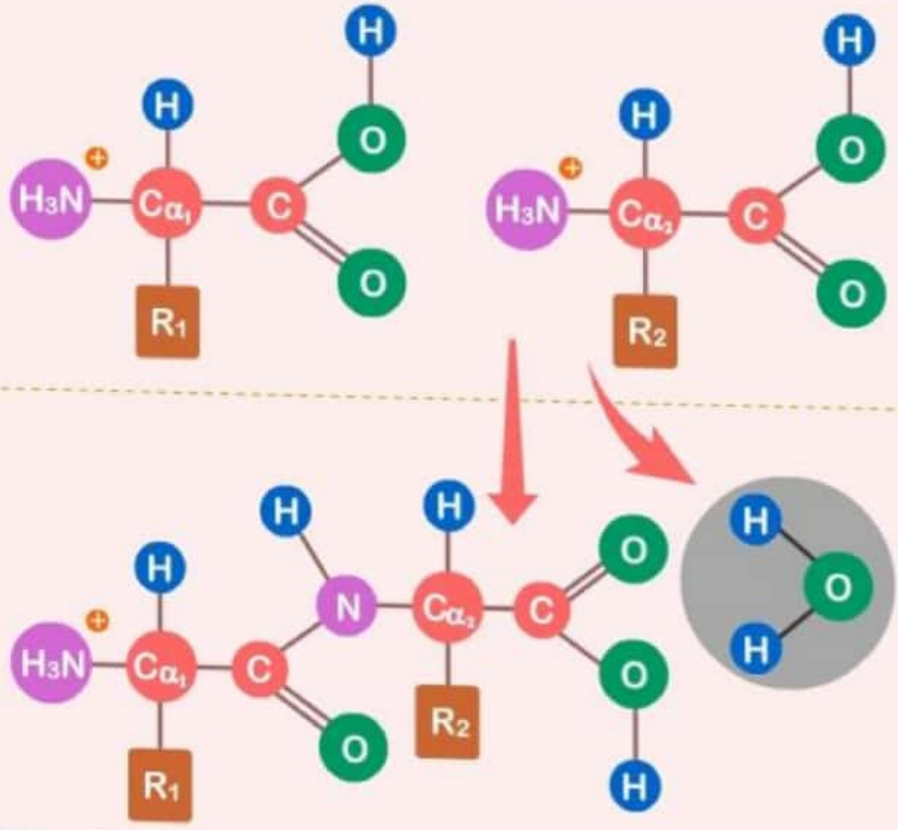
1 letter amino acid code
Relative molecular mass
Molecular formula

S 105.09 $C_3H_7NO_3$ **Ser** 87.08 Serine

3 letter Amino acid code
MW−H_2O Molecular weight in water
Chemical Structure
Chemical name

THE PEPTIDE BOND

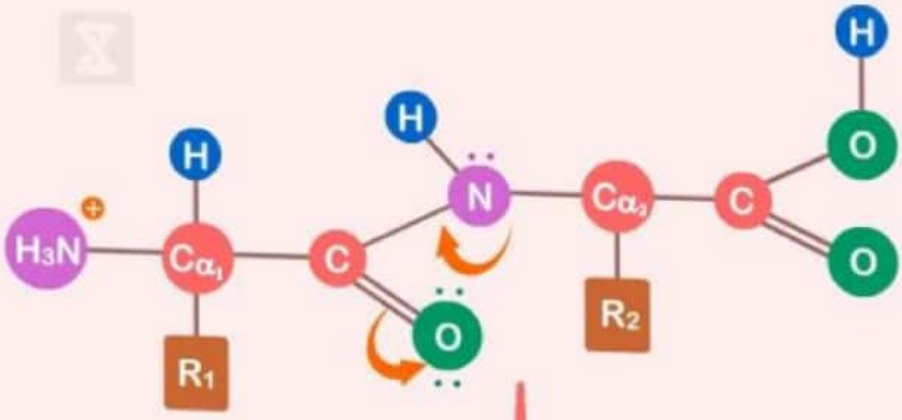
Part-2



When two amino acids come together, a reaction can occur between the carboxylic tail of the leading end with the amine head of the trailing end.

Each amino acid gives up a part of itself in a dehydration reaction and the product of their interaction is the peptide bond.

The new bond enjoys a type of resonance that strengthens it as the electrons about the nitrogen and oxygen delocalize producing a partial double bond.



The result of this resonance makes this bond difficult to rotate since the newly formed electron clouds are stabilzed and do not like to bump into things.

Peptide bonds form a rigid backbone for the many proteins it is a part of.