

General Science And Ability

Date: _____

Q Explain what a balanced diet is and why it is essential for maintaining good health. Discuss the potential consequences of having an imbalanced diet on one's health?

(Answer)

Balanced Diet:

"Balanced diet is the diet that contains the balanced amount of 5 basic nutrients such as proteins, carbohydrates, vitamins, minerals and fats for the proper functioning of the body."

Explanation:

Balanced diet is very necessary for the proper and long-term functioning of the body. It doesn't mean that every individual should have an equal amount of diet but instead it varies from person to person.

Example:

1. A person with sedentary habits would need less energy and nutrients as compared to the person who is on his feet all day.
2. The required diet for a 15 year old is different from an adult.

Importance:

A balanced diet is necessary as it regulates and maintains many of the vital functions of the body. Few are listed below:

- * **Carbohydrates:** carbohydrates are the main source of energy for the body.
- * **Proteins:** These are essential for the growth and repair of muscle tissues and other body tissues.
- * **Fats:** These are also source of energy and are important in relation to the fat soluble vitamins.

* **Vitamins:** Fat soluble and water soluble vitamins are important for many of the chemical reactions in the body.

* **Minerals:** Minerals are inorganic compounds occurring in the body and are essential for the normal function.

* A diet containing these nutrients along with dietary fibres and water is considered as balanced diet and the excess and deficiency of these nutrients can cause **imbalanced diet** leading to serious consequences.

↳ Potential Consequences of Imbalanced diet:

Imbalanced diet can lead to serious consequences of which some are:

1-	Excess amount of carbohydrates containing food	⇒	OBESITY	⇒	Heart Diseases and increases the risk of Myocardial Infarction.
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2-	Low amount of Vitamins	⇒	Example Vitamin 'D'	⇒	can cause 'Rickets' Weakening of bones.
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3-	Excess amount of Vitamins	⇒	Example Vitamin 'D'	⇒	Mental Retardation
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Minerals Deficiency	→	Example 'Calcium'	→	Osteoporosis
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Water Deficiency	→	Leads to	→	Anemia
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Therefore, it is necessary to maintain balanced diet in order to avoid all the health hazardous diseases and also to lead a good, healthy and prolonged life.

Q Explain the role of enzymes in biological processes. Provide an overview of how enzymes work, including their specificity. Give examples of enzymes and their functions in the human body.

Answer

Role of enzymes:

Enzymes are known as the 'biological catalyst' in the living organism as they speed up the reactions millions times faster. Enzymes help to catalyze the reactions and are very specific in nature i.e. specific enzyme performs specific reactions only.

Example

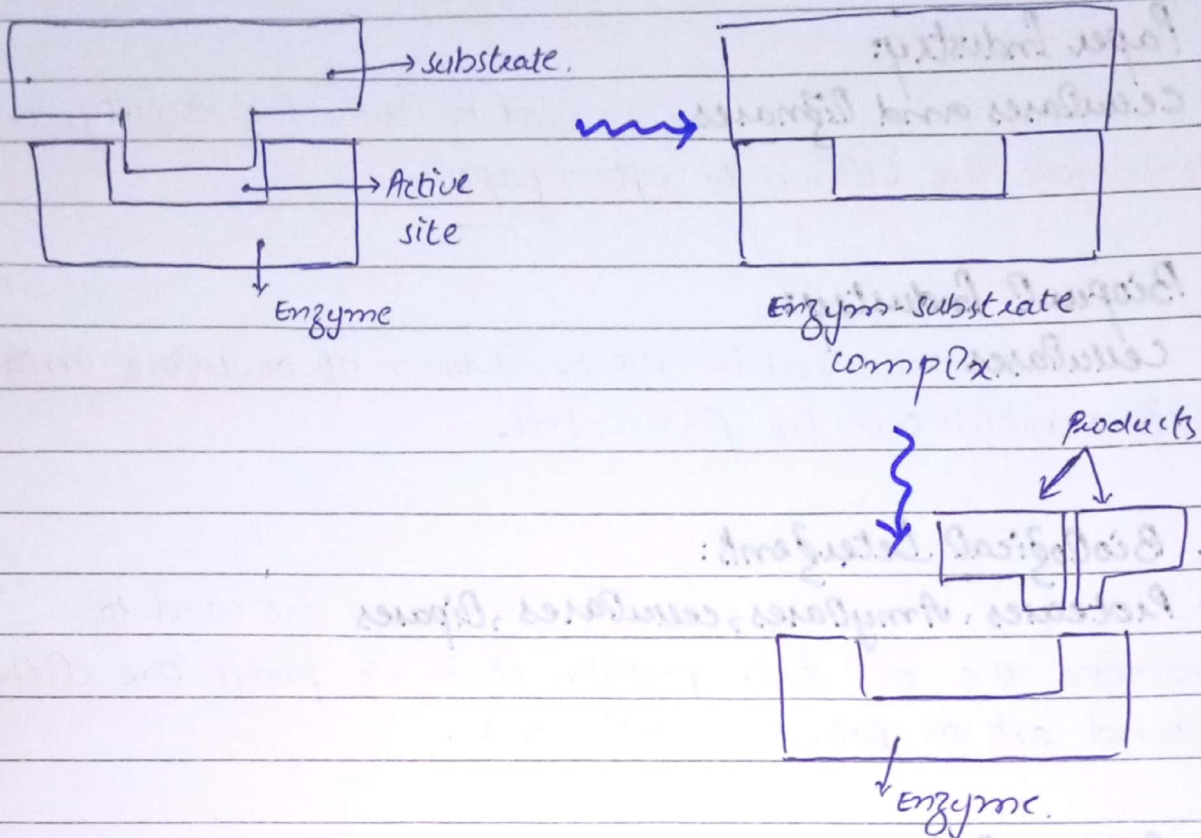
- *1 'Urease' enzyme is only used for urea deposition.
- *1 'Proteases' only act on proteins.

Working of enzyme:

Enzymes are very specific in their actions and react with specific substrate only. Enzymes are globular proteins and react with the substrate molecule by binding it to the active site (also called catalytic site)

and after reaction converts the substrates into products.

General Example:



* working of enzyme.

Examples of Enzymes and Their functions

There are various number of enzymes and perform various functions in different fields of life.

1. Food Industry:

Enzymes play vital role in the food industry.

* **Amylases** is used in the production of sugar from starch in production of corn-syrup.

* **Catalyze** enzyme is used in the breakdown of starch into glucose and in the baking fermentation process of yeast to raises the dough.

* **Proteases**: is used in the production of biscuits and to lower the protein level.

* **Rypsin** is used in the pre-digestion of baby food.

* **Lactases** is used to break the Lactose to obtain β -Glucose and β -Galactose.

* **Renin** is used in the production of yeast. : *renin*

2- Paper Industry:

* **Cellulases and Lignases** are used to lower the viscosity, and to remove the Lignin to soften paper.

3- Biofuel Industry:

* **Cellulases** are used in the breakdown of cellulose into sugars which can be fermented.

4- Biological Detergents:

* **Proteases, Amylases, cellulases, Lipases** are used to remove the oil stain, protein stain etc from the clothes and acts as fabric conditioners.

5- Rubber Industry:

* **Catalases** enzymes are used to convert latex to form rubber.

↳ There are also other number of functions performed by the enzymes within the body of living organisms and outside. They are also used in **leather industry, textile, agriculture, medicine, environment, pollution control** etc.

