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DEPARTMENT; PHARMACOLOGY

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QUESTION;

1a. What are coenzymes

b. Differentiate between fat and water soluble vitamins

c. Describe niacin in relation to its coenzymic function

ANSWERS;

1a. A substance that enhances the action of an enzyme. (An enzyme is a protein that functions as a catalyst to mediate and speed a chemical reaction).

Coenzymes are small molecules. They cannot by themselves catalyze a reaction but they can help enzymes to do so. In technical terms, coenzymes are organic nonprotein molecules that bind with the protein molecule (apoenzyme) to form the active enzyme (holoenzyme).

b. Water-soluble vitamins dissolve in water, which means these vitamins and nutrients dissolve quickly in the body. Unlike fat-soluble vitamins, water-soluble vitamins are carried to the body's tissues, but the body cannot store them. Any excess amounts of water-soluble vitamins simply pass through the body.

In fat soluble vitamins absorption requires bile salt while in water soluble vitamins the absorption is simple.

In fat soluble vitamins it is stored in the liver but that of water soluble vitamins has no storage.

Fat soluble vitamins has carrier proteins while in water soluble has none.

c**. NIACIN(VITAMIN B3):**  Generally referred to as niacin, is a water-soluble vitamin. This vitamin can generally be found in two distinctive forms, namely nicotinic acid and nicotinamide. These substances are used by the body to form the coenzymes NAD and NADP. Niacin coenzymes degrade carbohydrates, fats, proteins and alcohols and synthesize fatty acids and cholesterol. They play a role in cell signaling.

**Functions Vitamin B3**

Niacin assists functions of the nervous and digestive system. It plays a role in food metabolism and in the formation of red blood cells and skin. NAD and NADP are coenzymes that are part of the energy production system of the body. This system works by means of oxidation and reduction (redox) reactions. Niacin deficiency occurrence causes many symptoms, such as fatigue, headaches, dry skin, loss of appetite, ulcers and emotional instability. On rare occasions (mainly in developing countries) people may experience severe deficiency, which leads to a condition known as pellagra. This conditions is commonly characterized by the 4 D's: dermatitis, diarrhoea, dementia and death. Pellagra literally means raw skin. The conditions was named this because the skin of a patient develops a dark pigmented rash on areas exposed to bright sunlight.

**Vitamin B3 in food**

Niacin is part of a range of foods, for example meat, fish, bread, yeast, nuts, seeds, soy beans, potatoes, dried fruit, tomatoes and peas. Milk, green-leaved vegeatbles and coffee and tea also provide some niacin.

**Vitamin B3 as a supplement**

Niacin is recommended for dizziness, Post Menstrual Syndrome (PMS) and arthritis. It is a useful preparation for burn treatment. Niacin can also be useful for alcohol addicts and people with high cholesterol, mental problems, severe stress problems or hyperthyroid, for athletes and for elderly people. Niacin is suspected to decrease the possibility of introduction of certain types of cancer such as leukaemia, as a result of increased levels of DNA-repairing coenzymes (NAD). People suffering from HIV may be given extra niacin to postpone symptoms and elongate their life.