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BCH 204

ASSIGNMENT ON VITAMINS AND COENZYMES

QUESTION 1a

What are coenzymes?

Coenzymes are reusable non-protein molecules that contain carbon (organic). They bind loosely to an enzyme at the active site to help catalyze reactions. Most are vitamins, vitamin derivatives, or form from nucleotides.

b) Differentiate between fat and water soluble vitamins.

The main difference between water-soluble vitamins and fat-soluble vitamins is how they’re absorbed into and act within the body—but there are other considerations to keep in mind for all vitamin types.

One major benefit to water-soluble vitamins? The chance they’ll build up within the body is highly unlikely, even at large amounts; any excess exits the body when you pee. This also means that because water-soluble vitamins are either used or excreted so quickly, if you want to reap the health rewards associated with water-soluble vitamins, you’ll need to consistently get them into your system through nutrient-dense foods and supplements that help [fill the gaps in your diet](https://ritual.com/articles/why-you-need-vitamins).

Fat-soluble vitamins, on the other hand, don’t immediately leave the body—and, instead, are stored in the liver and fatty tissue. Because these vitamins are stored in the body, excess is more likely—and that’s not necessarily a good thing.

C) Describe niacin in relation to its coenzymes function

## **Description Vitamin B3**

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.

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.

## 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 coffe and tea also provide some niacin. Cereals may be fortified with niacin. Some foods, such as corn, may release niacin upon cooking. Before cooking corn only contains bound, unavailable niacin.

## 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 increase levels of DNA-repairing coenzymes (NAD). People suffering from HIV may be given extra niacin to postpone symptoms and elongate their life.