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1(a) 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).

1(b)

Fat Soluble Vitamins

- Solubility: Soluble in fats and organic solvents.
- Digestion: Requires fats and biles.
- Excretion: Via faeces.
- Storage: Stored in the body in fat deposits and in liver.
- Toxicity: Overdosage leads to toxicity.
- Composition: Composed of Carbon, Hydrogen and Oxygen.

Water Soluble Vitamins

- Solubility: Soluble in water.
- Digestion: Easily absorbed in the intestines
- Excretion: Via urine.
- Storage: Not stored in the body except Vitamin B12
- Toxicity: Not usually toxic as it is excreted easily once given in excess.
- Composition: Some are composed of Sulfur, Cobalt and Nitrogen.

1 (c) 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.

The vitamins information pages - Vitamin B3 (niacin)

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.

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 condition is commonly characterized by the 4 D's: dermatitis, diarrhoea, dementia and death. Pellagra literally means raw skin. The condition was named this because the skin of a patient develops a dark pigmented rash on areas exposed to bright sunlight.