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**1.) Coenzyme:** 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 catalyse 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).

2.)

**The differences in properties for fat-soluble and water-soluble vitamins.**

 **Properties**

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| **Fat-soluble vitamins**  | **Water-soluble vitamins** |
| Soluble in fat.  | Soluble in water. |
| Require bile and lipids for absorption.  | Easily absorbed by the intestine |
| Can become toxic in excess amounts (likely to result from supplements and not diet) as these are not readily excreted and are stored for later use. | Excess amounts are readily excreted in the urine so toxicity resulting from overdosing is rare. |
| Stored in the liver and fatty tissues until the body needs them so it does not need to be supplied by the diet frequently.  | Not stored in a considerable quantity (except vitamin B12), so needs to be supplied by the diet frequently |
|  Slow onset of deficiency symptoms e.g. months to more than a year.  |  Fast onset of deficiency symptoms e.g. weeks to months. |

3.) Vitamin B3, also known as niacin or nicotinic acid, is a water-soluble vitamin, used by the human body as nicotinamide (also called ‘niacinamide’) to form the coenzymes nicotinamide adenine dinucleotide (NAD) and nicotinamide adenine dinucleotide phosphate (NADP).

These substances are used by the body to form the coenzymes NAD and NADP. Niacin coenzyme degrade carbohydrate, fats, proteins, and alcohols and synthesize fatty acids and cholesterol. They play a role in cell signalling. Niacin assist function of the nervous 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. Vitamin B3, also known as niacin or nicotinic acid, is a water-soluble vitamin, used by the human body as nicotinamide (also called ‘niacinamide’) to form the coenzymes nicotinamide adenine dinucleotide (NAD) and nicotinamide adenine dinucleotide phosphate (NADP).