Vitamins

Vitamins are small organic molecules that cannot be synthesized by the body and therefore must be included in the diet (an exception is Vitamin D, which your body can make). Vitamins and some minerals act as **coenzymes** in the body. This means that they assist in enzyme-catalyzed reactions and enhance enzyme activity. Some vitamins are **water-soluble**—they can be dissolved in water. If there is an excess of a water-soluble vitamin in your body, it is excreted in the urine. Other vitamins are **fat-soluble**—they are absorbed and stored like fats. Overdoses of fat-soluble vitamins can be dangerous, even lethal. There are many essential vitamins, and the chart below highlights four of them:

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| **Vitamin** | **Best Sources** | **Essential for:** |
| A*Fat-soluble* | fish-liver oils, liver and kidney, green and yellow vegetables, yellow fruit, tomatoes, butter, egg, yolk | Growth, health of the eyes, functioning of skin cells and mucous membranes |
| B*Water-soluble* | Meat, soybeans, legumes, milk, whole grains | Growth, carbohydrate metabolism, functioning of the heart, nerves, and muscles |
| C*Water-soluble* | Fruit (especially citrus), tomatoes, leafy vegetables | Growth, wound healing, strength of blood vessels, development of teeth, health of gums |
| D*Fat-soluble* | Fish-liver oil, liver, fortified milk, eggs, irradiated foods  | Growth, calcium and phosphorous metabolism, bones and teeth |
| K*Fat-soluble* | Green vegetables, soy bean oil, tomatoes | Normal blood clotting, liver function |

Check Your Understanding:

* Define coenzyme, water-soluble, and fat-soluble.
* Energy drinks often contain megadoses of vitamin B. During flu season, people commonly recommend megadosing on vitamin C. Why isn’t it actually useful to megadose on vitamins B and C?
* You are responsible for knowing the function of each of these vitamins. Answer questions #6 and #7 on your Quarter 1 review guide.