VITAMIN B12

THE UNIVERSITY OF NORTH DAKOTA
Dining Services

FACTSHEET

Vitamin B12 is an essential water-soluble vitamin that is commonly found in a variety of foods such as fish, shellfish, meat, and dairy products. Vitamin B12 is frequently used in combination with other B vitamins in a vitamin B complex formulation. It helps maintain healthy nerve cells and red blood cells and is also needed to make DNA, the genetic material in all cells. Vitamin B12 is bound to the protein in food. Hydrochloric acid in the stomach releases B12 from protein during digestion. Once released, B12 combines with a substance called intrinsic factor (IF) before it is absorbed into the bloodstream.

The human body stores several years' worth of vitamin B12, so nutritional deficiency of this vitamin is extremely rare. Elderly are the most at risk. However, deficiency can result from being unable to use vitamin B12. Inability to absorb vitamin B12 from the intestinal tract can be caused by a disease known as pernicious anemia. Additionally, strict vegetarians or vegans who are not taking in proper amounts of B12 are also prone to a deficiency state.

A day's supply of vitamin B12 can be obtained by eating 1 chicken breast plus 1 hard-boiled egg plus 1 cup plain low-fat yogurt, or 1 cup milk plus 1 cup raisin bran.

Vitamin B12 is a water-soluble vitamin that is naturally present in some foods, added to others, and available as a dietary supplement and a prescription medication. Vitamin B12 exists in several forms and contains the mineral cobalt, so compounds with vitamin B12 activity are collectively called "cobalamins". Methylcobalamin and 5-deoxyadenosylcobalamin are the forms of vitamin B12 that are active in human metabolism

By itself, Vitamin B12 serves the body by helping to maintain sheaths that surround and protect nerve fibers.
Recommended Intakes
• Recommended Dietary Allowance (RDA): average daily level of intake sufficient to meet the nutrient requirements of nearly all (97%–98%) healthy individuals.
• Adequate Intake (AI): established when evidence is insufficient to develop an RDA and is set at a level assumed to ensure nutritional adequacy.
• Tolerable Upper Intake Level (UL): maximum daily intake unlikely to cause adverse health effects [5].

Table 1: Recommended Dietary Allowances (RDAs) for Vitamin B12

Age	Male	Female	Pregnancy	Lactation
Birth to 6 months*	0.4 mcg	0.4 mcg		
7-12 months*	0.5 mcg	0.5 mcg		
1-3 years	0.9 mcg	0.9 mcg		
4-8 years	1.2 mcg	1.2 mcg		
9-13 years	1.8 mcg	1.8 mcg		
14+ years	2.4 mcg	2.4 mcg	2.6 mcg	2.8 mcg

* Adequate Intake

Sources of Vitamin B12

Table 2: Selected Food Sources of Vitamin B12

Food	Micrograms (mcg) per serving	Percent DV*
Liver, beef, braised, 1 slice	48.0	800
Clams, cooked, breaded and fried, 3 ounces	34.2	570
Breakfast cereals, fortified with 100% of the DV for vitamin B12, 1 serving	6.0	100
Trout, rainbow, wild, cooked, 3 ounces	5.4	90
Salmon, sockeye, cooked, 3 ounces	4.9	80

Trout, rainbow, farmed, cooked, 3 ounces	4.2	50
Beef, top sirloin, broiled, 3 ounces	2.4	40
Cheeseburger, double patty and bun, 1 sandwich	1.9	30
Breakfast cereals, fortified with 25% of the DV for vitamin B12, 1 serving	1.5	25
Yogurt, plain, 1 cup	1.4	25
Haddock, cooked, 3 ounces	1.2	20
Tuna, white, 3 ounces	1.0	15
Milk, 1 cup	0.9	15
Cheese, Swiss, 1 ounce	0.9	15
Beef taco, 1 taco	0.8	13
Ham, cured, roasted, 3 ounces	0.6	10
Egg, large, 1 whole	0.6	10
Chicken, roasted, ½ breast	0.3	6

Vitamin B12 and Healthful Diets

• Emphasizes a variety of fruits, vegetables, whole grains, and fat-free or low-fat milk and milk products:
Milk and milk products are good sources of vitamin B12. Many ready-to-eat breakfast cereals are fortified with vitamin B12.
• Includes lean meats, poultry, fish, beans, eggs, and nuts.
• Fish and red meat are excellent sources of vitamin B12. Poultry and eggs also contain vitamin B12.
• Is low in saturated fats, trans fats, cholesterol, salt (sodium), and added sugars.
• Stays within your daily calorie needs.

References:

Natural Medicines Comprehensive Database, (2010). In Vitamin B12: MedlinePlus Supplements. Retrieved June 1, 2010, from *http://www.nlm.nih.gov/medlineplus/druginfo/natural/patient-vitaminb12.html*

Mayo Clinin Staff, (2010). In Vitamin B12. Retrieved June 1, 2010, from *http://www.mayoclinic.com/health/vitamin-B12/NS_patient-vitaminb12*