Evidence-based Vitamin B1 (Thiamine) Usage

Name(s): Thiamin, thiamine, biamine, betaxin, bewon, thiamindisulfide and benfotiamin.

Description: Thiamine is a water-soluble vitamin which is used to protect against excess water. This was the first identified B vitamin thus its name. It plays the role of a coenzyme in the Krebb's cycle (a biological pathway converting blood sugar (glucose) into energy) and the central nervous system needs vitamin B1 for functioning. Due to its effects on mental attitude and the nervous system, Thiamine is also known as the "morale vitamin".[1]

Absorption/Storage: Thiamine is absorbed in the upper and lower sections of the small intestine. Upon absorption, the vitamin is carried by the circulatory system to the liver, kidneys, and heart. Vitamin B1 may then combine with manganese resulting in an active enzyme that breaks down complex carbohydrates into simple sugars. Since this is a water-soluble vitamin it is not stored in the body; therefore, the excess is excreted in the urine. Thiamine must be replenished every 5-6 hours since it is excreted. Alcohol easily destroys this vitamin. Depletion of thiamine will result if sugar is consumed in excess and smoking has the same effect.[1]

One study has demonstrated a significantly improved thiamine bioavailability from benfotiamin compared with the other [vitamin B1] preparations. The lowest bioavailability was detected with thiamindisulfide. From [their] results it can be concluded that oral administration of benfotiamin is best suitable for therapeutical purposes owing to its excellent absorption characteristics.[2]

Recommended Dietary Allowance/Dietary Reference Intake:[3]

Persons	U.S. (mg)
Birth to 3 years of age	0.2-0.5
4 to 8 years of age	0.6
9 to 13 years of age	0.9
Adolescent and adult males	1.2
Adolescent and adult females	1.0-1.1
Pregnant females	1.4
Breast-feeding females	1.4

Optimum Daily Allowance (Adult): 50-100 mg.[4]

Tolerable Upper Intake Levels: None available.

Principal Uses: Congestive heart failure, patients on loop diuretics,[5-8] diabetic neuropathy,[9-14] epileptics being treated with dilantin (phenytoin),[9] and thiamine deficiency (especially in Crohn's disease, multiple sclerosis, and other neurological diseases).[15-16]

Proposed Uses: Age-related cognitive decline (ARCD) & Alzheimer's disease,[9,17] diabetes, low back pain (in combination with vitamin B6 and vitamin B12),[17] canker sores,[17,18] fibromyalgia and pregnancy support.[18]

Traditional Uses: Cardiomyopathy (only for wet beri beri), dysmenorrhoea (painful menstruation), HIV support, multiple sclerosis and pre- and post-surgery health.[17]

Healthy Sources:
High (40%+ US RDA): Brazil nuts, brewer's yeast, buckwheat, millet, navy beans, oatmeal, peanuts with or without skins, pecans, pine nuts, pinto beans, pistachio nuts, rice polishings, red beans, soybean flour, dry soybeans, split peas, sunflower seeds, torula yeast, wheat bran and wheat germ.[9]

Medium (25-39% US RDA): Cashews, whole-ground cornmeal, hazelnuts, dry lima beans, whole grain rye, mung beans, whole wheat flour, whole wheat grain and wild rice.[9]

Contraindications: If you are taking this dietary supplement without a prescription, carefully read and follow any precautions on the label. For thiamine, the following should be considered:

Allergies--Tell your health care professional if you have ever had any unusual or allergic reaction to thiamine. Also tell your health care professional if you are allergic to any other substances, such as foods, preservatives, or dyes.

Pregnancy--It is especially important that you are receiving enough vitamins when you become pregnant and that you continue to receive the right amount of vitamins throughout your pregnancy. The healthy growth and development of the foetus depend on a steady supply of nutrients from the mother. However, taking large amounts of a dietary supplement in pregnancy may be harmful to the mother and/or foetus and should be avoided.

Breast-feeding--It is especially important that you receive the right amounts of vitamins so that your baby will also get

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the vitamins needed to grow properly. However, taking large amounts of a dietary supplement while breast-feeding may be harmful to the mother and/or baby and should be avoided.

Children--Problems in children have not been reported with intake of normal daily-recommended amounts.

Older adults--Problems in older adults have not been reported with intake of normal daily-recommended amounts. Studies have shown that older adults may have lower blood levels of thiamine than younger adults. Your health care professional may recommend that you take a vitamin supplement that contains thiamine.

Medicines or other dietary supplements--Although certain medicines or dietary supplements should not be used together at all, in other cases they may be used together even if an interaction might occur. In these cases, your health care professional may want to change the dose, or other precautions may be necessary. Tell your health care professional if you are taking any other dietary supplement or prescription or non-prescription (over-the-counter [OTC]) medicine.[18]

Interactions:

Decreases Vitamin Availability:	Antibiotics, sulfa drugs,[4] oral contraceptives,[4,17] alcohol,[9,19] loop diuretics,[17,19]antacids, individually supplemented B vitamins, charcoal, coffee, fibre supplements, 5-fluorouracil and tea.[19]
Increases Vitamin Availability:	Calcium, vitamins C and E,[4] vitamins B2 and B3,[17] and magnesium.[19]
Is Decreased By Vitamin Availability:	Stavudine side effects.[17]
Is Increased By Vitamin Availability:	Tricyclic antidepressants,[17] and neuromuscular blocking agents.[20]

Deficiency: Lack of thiamine may lead to a condition called beriberi. Signs of beriberi include loss of appetite, constipation, muscle weakness, pain or tingling in arms or legs, and possible swelling of feet or lower legs. In addition, if severe, lack of thiamine may cause mental depression, memory problems, weakness, shortness of breath, and fast heartbeat. Your health care professional may treat this by prescribing thiamine for you.[18]

Toxicity/Side Effects: Vitamin B1 is non-toxic, even in very high doses.[9,17]

Treatment for Overdose: Induce vomiting or take activated charcoal with a laxative.[21]

Storage: To store this dietary supplement:

- Keep out of the reach of children.
- Store away from heat and direct light.
- Do not store in the bathroom, near the kitchen sink, or in other damp places. Heat or moisture may cause the dietary supplement to break down.
- Keep the oral liquid form of this dietary supplement from freezing.
- Do not keep outdated dietary supplements or those no longer needed. Be sure that any discarded dietary supplement is out of the reach of children.[18]

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