

Vitamin	Name	Solubility	Sources	RDG	Effects	Deficiency	Toxicity
	β-Carotene	Water	pigment found in plants, roots, fruits. Some conversion to Vitamin A in intestines	~25,000 IU, 15mg, NOT a substitute for Vit A	antioxidant, enhances immune function	see: Vitamin A	amenorrhea has been reported, but cause/effect has not been established
B-1	Thiamine	Water	whole grains, legumes, nuts, red meat, LV, eggs, asparagus	10-100mg	energy metabolism, nervous system function, can help prevent cataracts	1. Beri Beri - weakness, weight loss, peripheral neuropathy, tachycardia, CHF 2. Low grade - fatigue, loss of appetite, insomnia, difficulty concentrating	well-tolerated
B-2	Riboflavin		dairy, eggs, legumes, meat, fish, poultry, grains, green leafy vegs.	10-100mg	involved in carbohydrate metabolism, cofactor for enzymes related to ocular tissues,	stomatitis, glossitis, weakness, depression, personality changes, anemia, seborrheic dermatitis	well-tolerated
B-3	Niacin/Niacinamide		pork LV, green tea, beef, pork	50-3,000mg	involved in energy metabolism, component of NAD & NADH, tryptophan & serotonin metabolism, niacin affects serum lipid levels & is a precursor to glucose tolerance factor	1. early stages = nervousness, anxiety, headache, forgetfulness, GI issues 2. Pellegra = dementia, dermatitis, diarrhea	Large doses may reactivate healed peptic ulcers, may elevate serum uric acid levels, can rarely be implicated in LV cirrhosis
B-5	Pantothenic Acid		shitake mushrooms, cheese, trout, salmon, tuna, pork, beef, turkey, avacado, eggs	4-7mg	precursor for coenzyme A = mitochondrial energy production	fatigue, glossitis, cheilosis, abnormal gait	well-tolerated
B-6	Pyridoxine		yeast, wheat bran, rice, potatoes, fish, apricots, LV & organ meats	10-20mg	energy metabolism, nervous system function	depression, insomnia, nervousness, confusion, glossitis, stomatitis, infertility, osteoporosis	sustained 500mg/day can lead to 'stocking and glove' sensory neuropathy
B-7	Biotin		made by GI flora, also in red meat, LV, eggs, cheese, cabbage, bananas,	1,000-2,000mg	energy metabolism, hair, nail & skin health	fatigue, depression, muscular pain, dermatitis	not known if possible
B-9	Folic Acid		green veggies, nuts, legumes, grains, citrus	0.4-5mg	involved in DNA metabolism, nervous system function, immunity function	megaloblastic anemia, depression, anxiety, fatigue, apathy, dementia, cheilosis, glossitis, peripheral neuropathy	might rarely induce seizures in epileptics
B-12	Cobalamin		red meat, organ meats, eggs. Absent in plant materials	1,000mg orally, 1ml intramuscular injection	RBC development, DNA synthesis, metabolism of B-9	megaloblastic anemia, pernicious anemia (when due to inadequate intrinsic factor), fatigue, mental cognitive & neurological disorders, immune dysfunction, positive Rhombert's test	well-tolerated
C	Ascorbic Acid	Water	citrus, strawberries and kiwi, tomatoes & greens	200-3,000mg	tissue healing and health, antioxidant, also has antihistamine, antiviral and antibacterial effects	scurvy, fatigue, lassitude, edema, bone pain, ascites	'bowel tolerance' = abdominal pain & diarrhea, iron overload possible, 'rebound scurvy' from sudden cessation of large dose intake
P	Bioflavonoids	Water	parsley, green veggies, citrus, egg plant, grape seed oil, dark chocolate	500mg	antioxidant, anti-inflammatory, wound healing, reduce hypertension, reduces blood sugar, blood vessel elasticity	bruising	'bowel tolerance' = diarrhea
A	Retinol	Fat	carrots, tomatoes, pumpkin, dairy, fish, eggs	25,000-300,00 IU	epithelial tissue formation, visual function, immune function, antioxidant, spermatogenesis	night blindness, epithelial dysfunction, reduced immune function, Bitot spots	acute = headache, nausea & vomit chronic = yellow palms & eyelids, LV dysfunction, hypercalcemia, bone abnormality
D	Calcitriol		dairy, egg yolks. Note: can be synthesized from cholesterol using sunlight as last step in process	200-1,000 IU	absorption & metabolism of Calcium & Phosphorus	rickets in children, osteomalacia in adults	well-tolerated, GI upset possible, very rarely cerebral, CV & KI damage
E	α-Tocopherol		nuts, vegetable & fish oils, greens, wheat germ, seeds	400 IU	antioxidant, stabilizes cell membranes, inhibits platelet aggregation, aids metabolism of Vit K	fragile RBC's, anemia, peripheral neuropathy, spinal degeneration	can prolong clotting time & cause bruising & bleeding, inhibits Vit K
K	Phylloquinone		LV, green vegies. Most of daily requirement is met through synthesis by gut flora	65mg for females, 80mg for males	activates clotting factors, required for bone protein formation	prolonged bleeding	hemolytic RBC anemia, LV damage possible