

# Vitamins and Minerals

## ACHIEVEMENT SERIES

### FAT-SOLUBLE VITAMINS

These four vitamins dissolve in fat and are stored in your fatty tissues. If you supplement, take these while eating foods that contain some fat; this will boost their absorption. Don't pop too many of them, though, as it's not easy for your body to get rid of excesses, and vitamins can cause a number of side effects.

LEGEND	
RDA =	Recommended Dietary Allowances (for males age 19-24)
mg =	milligram
NE =	niacin equivalent (1 NE = 1 mg niacin)
a-TE =	alpha-tocopherol equivalent (1 alpha-TE = 1 mg active vitamin E)
IU =	international unit
mcg =	microgram
RE =	retinal equivalent

Vitamin	Why You Need It	Suggested Intake/Upper Limit	Food Sources	Deficiency Symptoms	Comments
A	Normal growth and development; moisturizes skin that retards aging; maintains good vision; may reduce exercise-induced free radicals	1,000-3,000 RE	Liver, egg yolk, milk; vitamin A in form of beta carotene	Night blindness	Toxic in large doses
D	Helps body absorb and use calcium and phosphorus, both of which are important for maintaining bone density	5-50 mcg	Fatty fish, fortified milk	Osteoporosis, rickets	One form is created when you are exposed to sunlight. Toxic in large doses
E	Antioxidant; may reduce free radical damage	15-800 mg of a-TE	Wheat germ, nuts, vegetable oils, whole grains, leafy vegetables	Degeneration of nerves and muscles	400 IU a-TE is recommended for antioxidant effects
K	Needed for blood clotting; required for formation of bone and kidney tissues (healthy kidneys help process wastes out of the body)	70mcg	Dark-green leafy vegetables, liver, dairy products	Impaired clotting	May be toxic in large doses

### WATER-SOLUBLE VITAMINS

These include the all-important antioxidant vitamin C and the B-complex vitamins, which are crucial for turning your food into energy. They dissolve in water, which means you'll pee out what you don't use, but you'll also need to replenish them each day. Even so, be careful not to take too much vitamin C, niacin or B6, as they can also lead to various ill effects.

Vitamin	Function in Body	Suggested Intake/Upper Limit	Food Sources	Deficiency Symptoms	Comments
C (Ascorbic acid)	May reduce exercise-induced free-radical damage; enhances iron absorption; important for connective-tissue health, (crucial for joints)	90 (RDA)-100 mg	Citrus fruits, tomatoes, green vegetables, cantaloupe	Fatigue, bleeding gums	Many believe this prevents or cures colds and other illnesses. High doses may not be absorbed.
B1 (Thiamin)	Carbohydrate and amino-acid metabolism, crucial elements for maintaining an active lifestyle	1.2 mg (RDA), or 0.5 mg per 1,000 calories	Enriched grains, meats (especially pork), nuts	Mental confusion, muscular weakness, anorexia	Thiamin requirements may increase in a high-carb diet.
B2 (Riboflavin)	Energy production from protein, carbs and fat	1.3 mg (RDA), or 0.6 mg per 1,000 calorie	Milk, eggs, meat, green vegetables	Dermatitis, burning and itching of eyes	Leaves the body through sweat, may increase dose to 2 mg.
Niacin (previously B3)	Metabolism of carbs, protein and fat (B1, B2 and niacin are involved in converting food to energy)	16 mg NE (RDA), or 6.6 mg NE per 1,000 calories	Meat, fish, poultry, nuts, enriched grains	Dermatitis, diarrhea and dementia	Sometimes used to control cholesterol; excess can be harmful
B6 (Pyridoxine)	Metabolism of protein, especially crucial when you bump up protein intake	1.3 mg (RDA), or 2-2.2 mg	Meat, fish, poultry, citrus fruits, tomatoes	Deficiencies rare in a diet adequate in protein; symptoms include dermatitis and depression	Do not exceed 35 mg daily. Doses over 100 mg a day can be harmful.
Folate (Folic acid)	Protects against heart disease and cancer; helps produce red blood cells; helps synthesize protein	400 mcg	Cereals, vegetables, bread, citrus fruits,	Anemia, possible increased risk of certain cancers	Strict vegetarians may be deficient. Some doctors recommend taking up to 800 mcg/day.
B5 (Pantothenic acid)	Energy production; forms enzymes for biochemical reactions	4-7 mg	Meat (liver), fish, poultry, whole grains, milk	Rare	
H (Biotin)	Fat and carbohydrate metabolism	30-100 mcg	Nuts, peanut butter, legumes	Rare (a diet high in raw egg whites can cause deficiency)	Also made by intestinal bacteria.
B12 (Cobalamins)	Healthy blood and nervous system; for transporting nutrients and signals, respectively	2.4 mcg	Meat, fish, poultry, milk, fortified cereals	Anemia	Vegetarians may be deficient.

## MINERALS

Minerals are elements that perform certain functions in your body, such as maintaining the correct fluid balance in your cells and keeping your bones strong enough to support all that muscle. Unless you're working on your Twinkie Defense, chances are you're not deficient in any of the 16 essential minerals. Most people don't, and shouldn't, supplement minerals, as too much can cause poor absorption of other nutrients and even kidney damage in some cases.

Mineral	What It Does For You	Suggested Intake	Food Sources	Deficiency Symptoms	Comments
Calcium	Important in bone structure, muscle contraction, blood pressure and blood clotting; a particularly important mineral for the active guy	1,000 mg	Dairy, broccoli, black-eyed peas	Bone loss (osteoporosis)	Research doesn't indicate a need for increased calcium in males. Doses over 2,500 mg daily can be harmful.
Phosphorous	Essential for tissue growth and renewal (elements that are especially crucial following a workout);	700 mg	Dairy, meat, salmon	Loss of appetite, muscle weakness	Deficiencies are rare; excess may contribute to bone loss. Do not exceed 4,000 mg daily.
Potassium	May prevent high blood pressure; maintains fluid and electrolyte balance, which are essential to prevent cramping; critical to well functioning heartbeat	2,000 mg	Fresh foods of all kinds	Deficiency goes hand-in-hand with dehydration	Highly processed foods are often low in potassium but high in sodium. Avoid diuretics, which cause dangerous potassium loss.
Sodium	Muscle contraction; nerve transmission; maintains fluid volume around cells, which aids in contracting muscle	500 mg	Most foods	Loss of body water	No known human diet lacks sodium. Too much sodium may aggravate blood pressure in some people.
Magnesium	Works with calcium to contract and relax muscles; 420 mg affects metabolism of vitamin D, calcium and potassium; needed for release of energy from nutrients	420 mg	Nuts, legumes, whole grains dark-green vegetables	Weakness, muscle-twitching, loss of appetite	Most people in the U.S. don't get enough magnesium in their diets. Profuse sweating can increase magnesium loss. Endurance athletes are at risk for magnesium deficiency.
Iron	Important in oxygen transport, such as during exercise	10 mg	Red meat, egg yolks, spinach, tofu, cereals	Fatigue, apathy, may feel cold, lowered work capacity	Iron deficiency is the most common nutrient deficiency, but an excess is toxic. Vitamin C enhances absorption.
Zinc	Important for making healthy sperm (implicated in helping get erections as well); for immune system and growth; component of enzymes that metabolize food	15 mg	Meat, liver, oysters, eggs, nuts	Infertility, loss of appetite, poor wound healing	Too much zinc can inhibit iron absorption and lower copper in the body.

## OTHER HERBAL SUPPLEMENTS

There are now 29,000 different supplements on the market, for which Americans shell out an estimated 16 billion a year. Yet, most never mention an ailment or malady by name, but rather have vague labels and indications of confusing results. The chief difference between supplements and prescription drugs is that the latter have undergone a long and costly testing process from the Food and Drug Administration, while supplements get to go directly to shelves, as long as the don't pretend to treat or cure anything too specific.

Herb	Intended Function	Common Dose	Herb	Intended Function	Common Dose
Ashwagandha (Withania somnifera)	Enhances energy; aids sexual performance; offers arthritis relief	4.5 mg daily	Glucosamine/Chondroitin	Healthy joint cartilage; relieve joint pain	500-1500 mg daily
Bilberry	Improves circulation	500-1500 mg daily	Gymnema sylvestre	Normalizes blood sugar; reduces sugar/sweet cravings	500-1500 mg daily
Boswellia	Helps normalize blood lipid levels; relieves arthritis symptoms	500-1,500 mg daily	Kudzu	Helps prevent and relieve hangovers	200-400 mg daily
Ciwujia	Increases endurance	400-800 mg daily	Peony root	Relaxes muscle spasm	1-2 gm daily
Coix	Reduces joint pain	1-2 gm daily	Saw Palmetto	Prostate health	
Cordyceps	Increases endurance and improves athletic performance, antioxidant	500-1,000 mg daily	St. John's Wort	Eases moderate depression	
Dandelion	Reduces joint pain	1-2 gm daily	Soy-Protein Powder	High cholesterol; lowers LDL	25 grams daily
Elderberry extract	Improves immune function	500-1500 mg daily	Venix	Increases blood flow to genitals	1-2 cups of tea daily
Echinacea	Boosts activity of immune system		Yerba mate	Increases energy and vigor	400-1,200 mg daily
Ginger extract	Reduces joint and muscle pain and inflammation	250-500 mg daily	Yucca	Improves joint function	