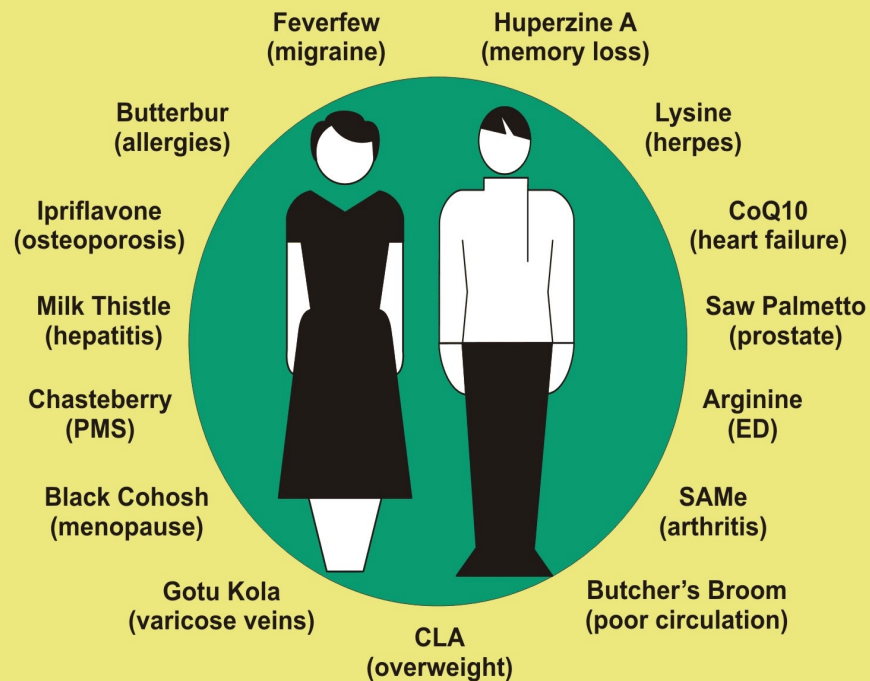


The ESSENTIAL INFORMATION you need on
86 Ailments and 223 Nutritional Supplements

The Nutraceutical Reference Guide



John Pillepich, Ph.D., CPhT

**The
Nutraceutical
Reference
Guide**

John Pillepich, Ph.D., CPhT

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First Edition

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Introduction

What are nutraceuticals?

Nutraceuticals (nutrition + pharmaceutical) are essentially any naturally derived component of food or herbs that have a beneficial effect in the body. The effect may be supportive, such as a vitamin or mineral that meets a basic need of the body, or it can be an herb, enzyme, coenzyme, or another component of food (e.g., an amino acid) that have therapeutic (medicinal) effects.

Often a food component becomes a nutraceutical when it is taken in amounts greater than what could be obtained in a normal diet. For example, the body uses small amounts of niacin (vitamin B3) as a coenzyme (NADH) that is necessary for the metabolism of carbohydrates, fats, and amino acids. Yet, at much greater amounts, niacin is effective at lowering cholesterol levels.

Alternatively, something could become a nutraceutical when it is taken in a different way. For example, lysine, an essential amino acid found in protein foods, is used in collagen synthesis for producing connective tissue. Yet, when taken by itself, away from other amino acids (protein foods), it has a therapeutic effect that is helpful for preventing or treating cold sores.

Until recently, nutraceuticals were mostly limited to vitamins and minerals, along with crude herbal preparations. Because of ongoing research, the nutraceutical family now has many more members, including isolated amino acids, enzymes and coenzymes, isolated medicinally active herbal ingredients, and standardized herbal products.

In the past, the potency of herbal products could vary widely, depending upon soil conditions, and when and where the herbs were harvested. Also, variations in climate could affect the amount of active ingredients in an herb. Because of this variation, where once two capsules of an herbal product might be an effective dose, a product from another harvest might need to be taken at twice the dosage to be effective. This was often why the use of herbal products was criticized by many mainstream health practitioners.

Now, many herbal products are standardized to a particular active component or marker in an herb, helping to maintain uniformity in potency from bottle to bottle, year to year. This consistency has garnered more respect from conventional medicine practitioners.

Never in history have so many natural, health-related products been available. Also, more research is proving the effectiveness of these nutraceuticals. Use them wisely and benefit.

Why take nutritional supplements?

People take supplements for five main reasons:

1. To avoid basic nutrient deficiencies, mostly because of less-than-perfect eating habits.
2. To treat current health problems.
3. To prevent health problems, especially when there is a genetic predisposition or an increased environmental risk.
4. To achieve optimal health.
5. To delay and reduce the effects of aging.

Reason #1

Many government and independent food surveys show that the average American diet is deficient in anywhere from a couple to a half dozen or more important nutrients. These deficiencies include the much discussed antioxidants. Basic nutritional formulas can usually satisfy these fundamental nutritional inadequacies. However, for reasons #2 through #5, a wider range of nutrients, at higher potencies, may be required.

Reason #2

There is no question now that higher than Recommended Dietary Allowance (RDA) levels of nutrients can help in the treatment of many ailments. When given half a chance, the human body can usually take care of itself. That means giving it the nutrients it needs, along with avoiding antinutrients (especially nicotine, caffeine, and alcohol).

Many health practitioners now use high doses of vitamins, minerals, essential fatty acids, coenzymes, and phytochemicals, to treat diseases. The use of these nutrients often has few negative side effects and, unlike most pharmaceutical medications, has many *positive* side effects.

Reason #3

One of the best uses of nutritional supplements is in the prevention of disease. For instance, even the National Institutes of Health (NIH) has reported that about two-thirds of all cancers are diet and environment related. Simply put, if you have plenty of the right nutrients in your diet (especially antioxidants), while avoiding the cancer-causing chemicals found in food (nitrosamines, aflatoxins, etc.), you can reduce your chances of getting a diet-related cancer. Our environment presents cancer-causing hazards in the forms of air and water pollution. Here too, nutrients can help—namely the antioxidants.

Another good example in disease prevention is heart disease. Atherosclerosis is the form of heart disease by which the coronary arteries become blocked with cholesterol deposits, often resulting in a

heart attack (myocardial infarction). While low-density lipoprotein cholesterol (LDL-C) is implicated in this process, it may not be the main initiator. One theory of heart disease considers this substance hazardous *only* when it becomes oxidized (ox-LDL-C). That is because LDL-cholesterol is not only natural, you actually cannot live without it! To prevent LDL-C from oxidizing (essentially becoming rancid), you need to consume mostly monounsaturated fatty acids (almond, avocado, canola, and olive oils) and a full range of antioxidants (fat- and water-soluble). Another theory of heart disease (originally proposed by Dr. Kilmer McCully more than 30 years ago) considers homocysteine, a byproduct of a high animal protein diet, a culprit in causing atherosclerosis. To prevent this problem, an adequate intake of vitamin B6, vitamin B12, and folic acid, is needed. A more recent theory of heart disease involves C-reactive protein (CRP). This protein is an indicator of inflammation, which is now thought to be involved in heart disease. Many nutraceuticals, including essential fatty acids, and some fruits and herbs, have anti-inflammatory properties.

Finally, osteoporosis is the classic example of a disease that is preventable with a proper nutrient intake and a supportive lifestyle. Unfortunately, calcium has been oversold as the answer to osteoporosis. While calcium is certainly important, you need a whole panoply of nutrients, including vitamins (C, D, and K), minerals (boron, copper, magnesium, manganese, silicon, and zinc), and essential fatty acids. Other important factors in preventing and treating osteoporosis include moderate (not high) intakes of protein and phosphorous, reducing or avoiding nicotine, caffeine, and alcohol, and an appropriate aerobic *and* anaerobic exercise program.

Reason #4

Optimal health means more than just the absence of disease—it means high-level wellness. This is where you have the energy and desire to do whatever needs to be done in your life, without relying on artificial stimulants. There are four essential components for high-level wellness: (1) a good, well-balanced diet; (2) a proper nutritional supplement program; (3) regular exercise; and (4) a positive mental/spiritual attitude.

In the above context, nutritional supplementation means at levels above the RDA. The RDAs are not necessarily optimal levels, and to quote from the 10th Edition of the National Research Council's Recommended Dietary Allowances, the RDAs “. . . are judged by the Food and Nutrition Board to be *adequate* to meet the *known* nutrient needs of *practically* all *healthy* persons.” [Italics added for emphasis.] The use of the words ‘adequate,’ ‘known,’ ‘practically,’ and ‘healthy,’ does not engender any confidence in the RDAs being optimal for everyone, especially for those unlucky people who are not healthy.

Also, the RDAs are based on the absence of clinical signs of disease, not the presence of optimal health. There is a big difference between not being overtly sick, and being vibrantly healthy.

For more than ten years, the Institute of Medicine (IOM) has worked on revising the RDAs. They are now part of the Dietary Reference Intakes (DRIs). Again, it is noted that “. . . *these are standards for healthy people—they are not appropriate for individuals or groups who are ill or for repletion of deficient individuals.*”

Reason #5

These days, people are living longer. However, that does not mean they are living better. In the wild, animals that have plenty to eat, and avoid predation and accidents, are usually healthy until they near their maximum potential lifespan. They then experience multi-organ failure and die. Humans, on the other hand, because of their ‘civilized diets’ of undernutrition and overconsumption, start their decline in their thirties and forties, even though our potential lifespan is around 120 years.

There are many theories of aging, including (1) cross-linking (loss of elasticity and cell permeability); (2) free radical (damage to cells and membranes); (3) genetic (inherited bad genes); (4) pacemaker (biological clock); (5) rate of living (limited vital life substances); (6) somatic mutations (spontaneous changes to genes); and (7) wear-and-tear (cells, tissues, and organs wear out). Whatever theory (or theories) may be correct, nutrition will play an important role, partially because one leading theory of aging (free radical damage) we have an easy answer to—a full and *balanced* intake of antioxidants. Of course, diseases also shorten lifespan, and the two at the top, cancer and heart disease, have confirmed nutritional components.

Understanding the Ailments Section.

The structure of the Ailments Section is listed below. Each health condition is limited to one page. Where possible, the ailment is listed by its common or layperson name, with its more scientific name below it, in parentheses.

The Overview section describes the ailment, usually within four to eight sentences. It provides enough information to get an understanding of the health condition. You are encouraged to research the ailment further, and not rely solely on the information presented here.

The next three sections are Vitamins & Minerals, Other Supplements, and Herbs. Each is subdivided into More Helpful and Less Helpful. Nutraceuticals listed in the More Helpful sections have more research supporting their usage for that ailment. Always consider them first. Information on the Less Helpful nutraceuticals may be limited to animal research, one or two human studies, or historical usage. Nutraceuticals are listed alphabetically, and in the Vitamins & Minerals section, the vitamins are listed first. Before using any nutraceutical, go to its listing in the Nutraceuticals Section and review it, especially any usage cautions it may have.

The Comments section usually includes information about conventional and alternative treatments. This section may also include miscellaneous comments.

Common Name (Formal Medical Name)

OVERVIEW

VITAMINS & MINERALS*

More Helpful:

Less Helpful:

OTHER SUPPLEMENTS*

More Helpful:

Less Helpful:

HERBS*

More Helpful:

Less Helpful:

COMMENTS

*See individual listings for dosages and cautions.

Understanding the Nutraceuticals Section.

The structure of the Nutraceuticals Section is listed below. Each nutraceutical is limited to one page. Where possible, the ingredient or supplement is listed by its common or layperson name, with its more scientific name below it, in parentheses. A nutraceutical can be a vitamin, mineral, fatty acid or other type of fat, amino acid, coenzyme, other food component, herb, or an extracted ingredient from an herb.

The Description/Function section describes each supplement in terms of its functions in the body, and in the case of herbs, native habitat, historical use, and active ingredients.

The next section, DRI (RDA or AI for Adults), applies to most vitamins and minerals. If there is an officially recommended amount, it is listed here, sometimes broken down by gender or age.

The Major Sources section lists good sources, food or otherwise. Sometimes the only source of the nutraceutical is as a supplement.

The Maintenance/Therapeutic Range section provides amounts that most people can take on a regular basis (lower range), or for short periods of time to treat an ailment (higher range). Herbal potencies usually list the amounts based on standardized extracts.

The Possible Therapeutic Applications section lists alphabetically the health conditions that may be helped by taking the nutraceutical. Go to the Ailments Section to see if the nutraceutical would be More Helpful or Less Helpful for any particular health condition.

The Comments section contains miscellaneous notes.

The Cautions section contains possible concerns with the supplement's usage based on health problems or medication conflicts.

Common Name

(Latin Name, Scientific Name, or Abbreviation)

DESCRIPTION/FUNCTION

DRI (RDA or AI for adults)

MAJOR SOURCES

MAINTENANCE/THERAPEUTIC RANGE

POSSIBLE THERAPEUTIC APPLICATIONS

COMMENTS

CAUTIONS

Additional information resources.

The purpose of this book is to provide basic information about many health conditions and nutritional supplements. It is not meant to be a definitive source of knowledge. If you are a layperson and have a major health problem, you are encouraged to research it further, and work with your healthcare provider in using the appropriate nutraceuticals in your treatment. Listed below are some suggested sources of information, with the basic ones meant for the average layperson, and the advanced ones for healthcare professionals.

To limit the size and price of this book, references were not included. However, the advanced resources listed below are fully referenced.

NUTRITION

Basic:

The Encyclopedia of Nutrition and Good Health. Robert Ronzio PhD.

Advanced:

Advanced Nutrition and Human Metabolism. Gropper, Smith, Groff.
Krause's Food, Nutrition, & Diet Therapy. Mahan, Escott-Stump. eds.

NUTRACEUTICALS & NATURAL HEALING - BOOKS, ETC.

Basic:

Healing Power of Vitamins, Minerals, and Herbs. Reader's Digest.

Healthnotes Online. Free at various websites.

Natural Health Bible. Bratman MD, Kroll PhD.

Prescription for Natural Cures. Balch MD, Stengler ND.

www.pdrhealth.com. Free.

Advanced:

Clinical Pearls Database, CD-ROM. Clinical Pearls Publications.

Clinician's Handbook of Natural Medicine. Pizzorno ND, Murray ND.

Hyperhealth Pro v.6.0, CD-ROM. In-Tele-Health.

Natural Standard Herb & Supplement Reference. Ulbricht, Basch, eds.

Also at: *www.naturalstandard.com.* Annual subscription.

Natural Medicines Comprehensive Database. Jellin PharmD, editor.

Also at: *www.naturaldatabase.com.* Annual subscription.

PDR for Herbal Medicines. Gruenwald, Brendler, Jaenicke, editors.

PDR for Nutritional Supplements. Hendler PhD, MD, Rorvik MS.

GENERAL HEALTH - BOOK & ONLINE

Basic:

Mayo Clinic Family Health Book. Litin MD, editor in chief.

www.medlineplus.gov. Free.

Ailments Section

PLEASE NOTE

The next 86 pages contain scientific and medical information about a variety of health conditions.

If you have a major health condition, or are taking medications, please consult with a qualified health professional before trying any of these supplements.

Acne Rosacea

(Adult Acne; Rosacea)

OVERVIEW

Acne rosacea is an inflammatory disorder affecting the skin of the cheeks, nose, and forehead. It appears as reddened areas with pimples, knobby bumps on the nose (rhinophyma), and thin red lines caused by enlarged blood vessels. The facial skin is often very dry. Rosacea develops slowly, and usually worsens gradually over time. Fair-skinned people, especially those who blush easier than the average person, are more susceptible. The cause of rosacea is unknown, but a variety of foods and conditions can aggravate it, including consumption of hot liquids, spicy foods, or alcohol; exposure to extremes of heat and cold; exposure to sunlight; skin mites; and stress.

VITAMINS & MINERALS*

More Helpful:

Less Helpful: vitamin B2; vitamin B12; vitamin C (topical).

OTHER SUPPLEMENTS*

More Helpful:

Less Helpful:

HERBS*

More Helpful:

Less Helpful:

COMMENTS

Conventional treatment includes topical antibiotic preparations. Other recommendations include using natural makeup and facial cleansers without fragrances and heavy oils, and avoiding astringents. For women, a natural progesterone cream might help. Always use a sunscreen when outdoors.

*See individual listings for dosages and cautions.

Acne Vulgaris

OVERVIEW

Acne vulgaris is a common form of acne seen in teenagers and young adults, affecting about 80% in some form. Males are affected more often, but females have more severe and more prolonged cases. Acne is probably caused by male sex hormones increasing oil production in the sebaceous glands. Bacteria, which live around the hair root, become more active and pimples are formed. Factors that can cause an outbreak include cosmetics, stress, steroids and other drugs, oral contraceptives, mechanical skin irritants, and climate.

VITAMINS & MINERALS*

More Helpful: vitamin A; zinc.

Less Helpful: vitamin B6; selenium.

OTHER SUPPLEMENTS*

More Helpful: *Saccharomyces boulardii*.

Less Helpful: essential fatty acids (omega-3 and omega-6).

HERBS*

More Helpful: chasteberry; guggulipid; tea tree oil (topical).

Less Helpful: burdock.

COMMENTS

Conventional treatment includes taking antibiotics or oral contraceptives. Some over-the-counter acne preparations work by drying up skin oil, as well as killing surface bacteria. Avoid oil-based skin care products, which can aggravate acne. Wash skin gently with unscented soap, and do not scrub. Do not pick or pop the pimples. Expose skin to moderate sunlight, but not long enough to get a sunburn.

*See individual listings for dosages and cautions.

Aging

OVERVIEW

Aging is the degenerative process of growing old. It is caused in part by a failure of body cells or organs to work normally, or the decreased ability to make new cells to replace those that are dead or defective. While aging is a natural process, it may be accelerated through infection, poor nutrition, contact with health hazards, or genetic problems.

VITAMINS & MINERALS*

More Helpful: almost all vitamins and minerals.

Less Helpful:

OTHER SUPPLEMENTS*

More Helpful: acetyl-L-carnitine (or L-carnitine); carnosine; CoQ10; DHEA; essential fatty acids (omega-3 & omega-6); lipoic acid; lutein; lycopene; melatonin; pregnenolone; resveratrol; vinpocetine.

Less Helpful:

HERBS*

More Helpful: ashwaganda; bilberry; garlic; ginkgo; grape seed; grape skin; green tea; milk thistle; turmeric.

Less Helpful:

COMMENTS

Anti-aging nutraceuticals perform one or more of the following functions: (1) stimulate or supplement production of enzymes and hormones; (2) are antioxidants that protect against the damage caused by free radicals; (3) have anticancer properties; (4) protect against heart-related diseases; (5) help with memory loss; (6) reduce inflammation; (7) increase circulation; (8) reduce the damaging effects of diabetes; (9) increase energy production (mitochondrial function); (10) support immune function; or (11) protect the various organ systems (eyes, kidneys, liver, etc.). There are too many nutraceuticals to list, but some to consider are listed above. Other recommendations include stopping smoking, avoiding excessive exposure to the sun, exercising regularly, eating plenty of organic fresh fruits (especially berries) and vegetables, not overeating, and getting at least eight hours of sleep every night. Aging cannot be stopped, but it can be slowed down.

*See individual listings for dosages and cautions.

Alcoholism

OVERVIEW

Alcoholism is characterized by an extreme dependence on alcohol, causing behaviors that are harmful to the individual and others. The cause of alcoholism varies, and may be a combination of factors, including genetics, family history, emotional disorders, and social environment. It is a long-term illness that starts slowly and may occur at any age. Medical problems caused by alcoholism include mental changes, damage to the liver (cirrhosis), nervous system disorders, cancer, diabetes, gastritis, kidney disease, and heart problems.

VITAMINS & MINERALS*

More Helpful: vitamin B1; magnesium.

Less Helpful: B-complex; vitamin C; chromium.

OTHER SUPPLEMENTS*

More Helpful: glutamine.

Less Helpful: acetyl-L-carnitine; N-acetyl cysteine; omega-6 fatty acid (GLA); pantethine; phenylalanine; SAmE; taurine; tyrosine.

HERBS*

More Helpful: milk thistle.

Less Helpful: kudzu; turmeric.

COMMENTS

Treatment usually includes attending a support program, and possibly taking one or more medications. Exercise regularly. Some acupuncture treatments may reduce the craving for alcohol. Some supplements reduce the craving for alcohol, some facilitate withdrawal, and some protect the liver. Finally, have a healthy diet that includes plenty of whole grains, fresh fruit and vegetables, high-quality protein, and other health-promoting foods, and limit intakes of sugar, caffeine, nicotine, and junk food.

*See individual listings for dosages and cautions.

Allergies

(Allergic Rhinitis; Hay Fever)

OVERVIEW

Allergies are a reaction to generally harmless antigens, including various foods, animal dander, cigarette smoke, house dust, and flower and tree pollens. Allergies can be classified as inhalant (breathed in) or ingested (a food eaten). Common symptoms include lung congestion, allergic eye swelling, fluid buildup, fever, itching, and intestinal complaints. Nasal irritation (allergic rhinitis), which is caused by allergens in the air, affects mostly young children and adolescents, but can occur in all age groups. Severe allergic reactions, called anaphylactic shock, can cause death.

VITAMINS & MINERALS*

More Helpful: vitamin C.

Less Helpful: pantothenic acid.

OTHER SUPPLEMENTS*

More Helpful: quercetin; thymus extract.

Less Helpful: omega-3 fatty acids (fish oil).

HERBS*

More Helpful: butterbur.

Less Helpful: stinging nettle.

COMMENTS

Conventional treatment includes taking medications, such as antihistamines and corticosteroids. For people at risk of anaphylactic shock, an epinephrine injection kit should be available at all times. Use air conditioners or air purifiers when pollen counts are high. Use dehumidifiers during damp weather to reduce mold and mildew growth. Clean regularly, using a vacuum cleaner with a HEPA (high energy particulate air) filter. Cover furniture with slipcovers that can be washed.

*See individual listings for dosages and cautions.

Angina Pectoris

OVERVIEW

Angina is identified by a cramping pain in the chest. Usually it is caused by a shortage of oxygen to the heart because of restricted blood flow from hardening of the coronary arteries (atherosclerosis). The pain usually travels down the left arm, and often there is a feeling of suffocation and impending death. Attacks of angina pectoris are often related to exertion, emotional excitement, and contact with intense cold. Angina is often a precursor to a heart attack (myocardial infarction).

VITAMINS & MINERALS*

More Helpful: magnesium.

Less Helpful: vitamin C; vitamin E.

OTHER SUPPLEMENTS*

More Helpful: acetyl-L-carnitine; arginine; carnitine; CoQ10; N-acetyl cysteine; propionyl-L-carnitine; ribose.

Less Helpful: bromelain; omega-3 fatty acids (fish oil).

HERBS*

More Helpful: arjuna; astragalus; hawthorn.

Less Helpful: kudzu.

COMMENTS

Conventional treatment includes medications (nitrates, beta blockers, calcium channel blockers) and surgery (angioplasty, bypass surgery). Other recommendations include stress reduction techniques (biofeedback, meditation, yoga), improvements to the diet, quitting smoking, and appropriate exercise. Do not exercise for at least an hour after eating heavy meals.

*See individual listings for dosages and cautions.

Anxiety

OVERVIEW

Anxiety is an emotion manifesting physical and mental symptoms such as sweating, trembling, feeling of worry, powerlessness, uncertainty, and fear that comes from thinking about some threat or danger that may or may not exist. Anxiety is often psychological, rather than a response to real conditions. The cause of the problem is complex and may involve a mental conflict about values and goals of life. Anxiety can also be caused by a change in health, income, work status, or family relationships. Anxiety is classified into many types, including generalized anxiety disorder, adjustment disorder with anxiety, obsessive-compulsive disorder, panic disorder, phobias, post-traumatic stress disorder, and social anxiety disorder.

VITAMINS & MINERALS*

More Helpful: inositol; magnesium.

Less Helpful: niacinamide (B3); calcium.

OTHER SUPPLEMENTS*

More Helpful: 5-HTP; chrysin; GABA; theanine.

Less Helpful: DHEA.

HERBS*

More Helpful: ashwaganda; bacopa; chamomile; gotu kola; hops; kava; passionflower; St. John's wort; valerian.

Less Helpful: skullcap.

COMMENTS

Conventional treatments include psychotherapy and medications (antidepressants, anti-anxiety medications, and beta blockers). Meditation, yoga, and biofeedback may also be helpful. Exercise regularly, especially walking outside in peaceful environments. Reduce intakes of alcohol, caffeine, and nicotine.

*See individual listings for dosages and cautions.

Asthma

OVERVIEW

Asthma is a lung disorder with symptoms including coughing (sometimes with phlegm), sudden difficulty in breathing, and a tight feeling in the chest. Asthmatic episodes may be started by breathing in foreign substances (allergens) or pollutants (including secondhand smoke), infection, vigorous exercise, or emotional stress. In response to the stimulus, the passages of the respiratory system narrow, making it more difficult for air to pass into and out of the lungs. Asthma has a higher incidence in the cities of industrialized countries in the higher latitudes. Being overweight also increases the risk for asthma.

VITAMINS & MINERALS*

More Helpful: choline; vitamin B6; vitamin C; vitamin E; magnesium.

Less Helpful: vitamin B12; selenium; zinc.

OTHER SUPPLEMENTS*

More Helpful: lycopene; thymus extract.

Less Helpful: DHEA; omega-3 fatty acids (fish oil); quercetin.

HERBS*

More Helpful: boswellia; butterbur; coleus forskohlii.

Less Helpful: ginkgo; licorice; skullcap.

COMMENTS

There are many medications available to prevent or treat asthma attacks. Also recommended is avoiding trigger substances by regularly dusting and using vacuum cleaners with special filters (HEPA), using an air conditioner or air filter, avoiding people who smoke, and pets. Yoga breathing techniques may be helpful. Learn stress reducing techniques. During cold, winter months, wear a scarf over your nose and mouth to warm the air. Avoid foods and beverages that contain sulfites, such as dried fruit, beer, and wine.

*See individual listings for dosages and cautions.

Bruising

(Capillary Fragility)

OVERVIEW

Bruising is a contusion to the skin caused by contact with a hard object. The capillaries (tiny blood vessels beneath the skin) are ruptured, but the skin is not broken. The bruised area swells as blood from the broken blood vessels seeps into the tissues and turns into various shades of red, blue, and purple. Eventually the blood cells are broken down, reabsorbed, and the discoloration and swelling disappear. Easy bruising that is not the result of dietary deficiencies (e.g., vitamin K) may be caused by some medications (e.g., blood thinners) or other health conditions (e.g., leukemia).

VITAMINS & MINERALS*

More Helpful:

Less Helpful: vitamin C; vitamin K (topical).

OTHER SUPPLEMENTS*

More Helpful: citrus bioflavonoids; quercetin.

Less Helpful:

HERBS*

More Helpful: bilberry; grape seed; grape skin; horse chestnut.

Less Helpful:

COMMENTS

Some medications, such as corticosteroids and aspirin, can increase the tendency for bruising.

*See individual listings for dosages and cautions.

Cancer

OVERVIEW

Cancer is a malignant tumor or growth caused when cells multiply uncontrollably, destroying healthy tissue. Cancer cells usually invade and destroy normal tissue cells, and then spread to other parts of the body via the lymph or bloodstream. The different forms of cancer are sarcomas, carcinomas, leukemias, and lymphomas. Warning signs for cancer may be a change in bowel or bladder habits, a nonhealing sore, unusual bleeding or discharge, a thickening or lump in the breast or elsewhere, indigestion or difficulty in swallowing, a change in a wart or mole, or a persistent cough or continuing hoarseness. Cancer usually develops gradually over many years. It can be the result of a combination of environmental, nutritional, behavioral, and hereditary factors.

VITAMINS & MINERALS*

More Helpful: beta-carotene; folic acid; gamma-tocopherol; vitamins (A, B6, B12, C, D, E); calcium; selenium.

Less Helpful: tocotrienols.

OTHER SUPPLEMENTS*

More Helpful: beta-glucans; bromelain; CoQ10; calcium D-glucarate; EPA/DHA; flaxseed; GLA; glutathione; green tea; I3C/DIM; isoflavonoids; lutein; lycopene; melatonin; N-acetyl cysteine; psyllium; resveratrol.

Less Helpful: astaxanthin; bioflavonoids; CLA; ellagic acid; IP-6; MCP; prebiotics; probiotics; propolis; quercetin; theanine.

HERBS*

More Helpful: astragalus; garlic; grape seed; mushrooms (maitake, reishi, shiitake, turkey tail); turmeric.

Less Helpful: bilberry; cat's claw; chlorella; cordyceps; ginseng; rosemary.

COMMENTS

The above nutraceuticals may help prevent or treat one or more cancers. Check individual listings to see if they are specific for a particular cancer. The National Cancer Institute estimates that approximately one third of cancers is diet related, and another third is due to environmental and lifestyle factors.

*See individual listings for dosages and cautions.

Canker Sores

(Aphthous Stomatitis)

OVERVIEW

Canker Sores are small sores or blisters on the inside of the lips or cheeks, or on any other part of the mouth coated with mucus. The cause of canker sores is unknown, but may include oral irritation, a food allergy, certain foods (citrus fruit, tomatoes), herpes infection, and emotional stress. They usually heal by themselves within two weeks, but can last much longer. Women are more likely to get canker sores than men.

VITAMINS & MINERALS*

More Helpful:

Less Helpful: vitamin/mineral deficiencies (folic acid, B1, B2, B6, B12, C, iron, zinc).

OTHER SUPPLEMENTS*

More Helpful:

Less Helpful: bioflavonoids; topical (lysine, probiotics, propolis).

HERBS*

More Helpful:

Less Helpful: topical (aloe vera, calendula, chamomile, goldenseal, licorice, myrrh, oregano oil).

COMMENTS

There are pastes and solutions to treat the infection and pain from canker sores. Nothing natural stands out for treating canker sores. Avoid spicy and salty foods, coffee, chewing gum, and alcohol. Use natural oral care products.

*See individual listings for dosages and cautions.

Cardiac Arrhythmia

OVERVIEW

Cardiac arrhythmias are any changes in the normal pattern of the heart beat. Abnormal heart rhythms are caused by problems with the electrical conduction system of the heart. There are several kinds of arrhythmias, including atrial fibrillation, ventricular fibrillation, atrial flutter, heart block, premature atrial contraction, premature ventricular contraction, and sinus arrhythmia. Arrhythmias affecting the ventricles are more serious than those of the atria. Arrhythmias may be brief or last for long periods of time. A temporary arrhythmia can be caused by something as common as alcohol or caffeine. Arrhythmias may involve either abnormally slow (bradycardia) or fast (tachycardia) changes in rhythm.

VITAMINS & MINERALS*

More Helpful: magnesium.

Less Helpful:

OTHER SUPPLEMENTS*

More Helpful: omega-3 fatty acids (fish oil); taurine.

Less Helpful: CoQ10.

HERBS*

More Helpful: rhodiola.

Less Helpful: cordyceps; hawthorn.

COMMENTS

Conventional treatments include medications, or an artificial pacemaker implanted in the chest. If you have a pacemaker, check with your doctor before taking fish oil supplements. Ventricular fibrillation can be an emergency, and is usually treated with an electrical defibrillator that delivers a shock to the heart. Avoid alcohol, caffeine, nicotine, and OTC drugs with stimulant properties. Exercise regularly, and try stress reduction techniques.

*See individual listings for dosages and cautions.

Cardiomyopathy

OVERVIEW

Cardiomyopathy is a disease of the heart muscle, and it is usually chronic. There are several types of cardiomyopathy: dilated, hypertrophic, and restrictive. Cardiomyopathy may be caused by infections (bacterial, viral, fungal), nutritional deficiencies (vitamin B1, selenium, carnitine), rheumatic fever, drug use (alcohol, cocaine, and some prescription medications), or an underactive thyroid gland (hypothyroidism). Cardiomyopathy can lead to a progressive weakening of the heart muscle, and it sometimes results in heart failure. Symptoms include shortness of breath, palpitations, chest pain, and weakness.

VITAMINS & MINERALS*

More Helpful:

Less Helpful: vitamin B1 (if deficient); magnesium; selenium (if deficient).

OTHER SUPPLEMENTS*

More Helpful: CoQ10.

Less Helpful: carnitine (if deficient); taurine.

HERBS*

More Helpful:

Less Helpful: Coleus forskohlii.

COMMENTS

Medications used to treat cardiomyopathy include angiotensin-converting enzyme (ACE) inhibitors, beta blockers, and diuretics. It is important to avoid alcohol and salt. Try to have as natural a diet as possible, and learn stress reduction techniques. Check with your doctor to decide what kind and amount of exercise is appropriate.

*See individual listings for dosages and cautions.

Carpal Tunnel Syndrome

(Repetitive Stress Injury)

OVERVIEW

Carpal tunnel syndrome is a condition involving tingling, pain, numbness, and weakness in the hand and wrist. It is often caused by repetitive compression of the middle nerve (median nerve) that passes through the wrist into the hand. Repetitive wrist movements related to work (e.g., power tools, machinery, typing) are often the cause. The syndrome is more common in women, especially in pregnant and in menopausal women.

VITAMINS & MINERALS*

More Helpful:

Less Helpful: vitamin B2; vitamin B6.

OTHER SUPPLEMENTS*

More Helpful:

Less Helpful: bromelain.

HERBS*

More Helpful:

Less Helpful: turmeric.

COMMENTS

Putting the wrist in a splint (especially during sleep) is one treatment. Nonsteroidal anti-inflammatory drugs (NSAIDs) are also used. Acupressure and acupuncture treatments can provide help. Take frequent breaks during activities requiring repetitive hand movements. Try ice packs (or frozen peas, etc.) on the wrists for five or ten minutes.

*See individual listings for dosages and cautions.

Cataracts

OVERVIEW

Cataracts are an eye disease in which the lens becomes covered in an opaque film that affects sight. The most common form is senile cataracts, which usually occur in people more than 50 years old. These cataracts are a result of a chemical change in the gelatinous lens protein encapsulated behind the iris. Cataracts are progressive. At first vision is blurred, and then bright lights cause glare, and images may appear double or distorted. If untreated, total vision can be lost.

VITAMINS & MINERALS*

More Helpful: vitamins (A, B1, B2, B3).

Less Helpful: vitamin C; vitamin E; selenium.

OTHER SUPPLEMENTS*

More Helpful: carnosine; lutein; omega-3 fatty acids (fish oil); quercetin.

Less Helpful: lipoic acid; lycopene.

HERBS*

More Helpful: bilberry; turmeric.

Less Helpful: ginkgo; grape seeds.

COMMENTS

Usually a cataract is treated surgically by replacing the lens with an artificial implant. Eat lots of fresh fruit and vegetables. If you smoke, quit. When out in the sun, wear sunglasses (must protect against UVA and UVB rays) and a hat.

*See individual listings for dosages and cautions.

Celiac Disease

OVERVIEW

Celiac disease is a disorder caused by a sensitivity to gluten that makes the digestive system unable to deal with fat. Gluten consists of two proteins, gliaden and glutenin. Gluten is found in some cereal grains (small amounts in barley and oats; moderate amounts in rye and triticale; large amounts in wheat). It makes dough elastic, and enables it to rise by trapping gas. People with celiac disease have a sensitivity to gluten (T-cell-mediated immune response) that reduces fat digestion, as well as the assimilation of many nutrients. Symptoms include vomiting, diarrhea, and fatigue. The disease may be present at birth or develop later in life.

VITAMINS & MINERALS*

More Helpful:

Less Helpful: For nutrient deficiencies, take a multi-vitamin and mineral supplement.

OTHER SUPPLEMENTS*

More Helpful:

Less Helpful: digestive enzymes; glutamine.

HERBS*

More Helpful:

Less Helpful:

COMMENTS

Treatment includes replacing the offending grains (especially wheat, rye, triticale, and barley) with substitutes, including products made with arrowroot, corn, potato, rice, soybean, and tapioca. Some people with celiac disease may also have difficulty digesting dairy products (lactose intolerant).

*See individual listings for dosages and cautions.

Chronic Fatigue Syndrome

OVERVIEW

Chronic fatigue syndrome (CFS), also called chronic fatigue immune deficiency syndrome (CFIDS), is a condition characterized by a disabling fatigue that lasts for six months or longer. Besides the fatigue, symptoms may include low-grade fever, muscle and joint pains, swelling of the neck glands, sore throat, headache, poor concentration, memory loss, and sleep problems. No single cause has been attributed to CFS, although viral infections are suspected, including Epstein-Barr virus. An overactive immune system, food allergies, and adrenal gland dysfunction, are also considered as possible causes. More women than men suffer from CFS, usually between the ages of 30 and 50 years old. Depression or other illnesses should be ruled out. When there is more muscle pain than fatigue, the condition is reclassified as fibromyalgia (FM).

VITAMINS & MINERALS*

More Helpful: vitamin B12; magnesium.

Less Helpful: pantothenic acid; vitamin C.

OTHER SUPPLEMENTS*

More Helpful: DHEA; NADH; phenylalanine.

Less Helpful: carnitine; CoQ10; essential fatty acids (omega-3 and omega-6); propionyl-L-carnitine; tyrosine.

HERBS*

More Helpful: licorice.

Less Helpful: astragalus; ginseng.

COMMENTS

Depending on the symptoms, conventional treatment may include nonsteroidal anti-inflammatory drugs (NSAIDs), MAO inhibitors, or antidepressants. Other possibilities include dietary modifications (reduced allergen content), cleaned home environment (reduced synthetics and chemicals), mild exercise, and meditation or other stress-reducing techniques.

*See individual listings for dosages and cautions.

Cold Sores

(Herpes)

OVERVIEW

Cold sores (also called fever blisters or herpes labialis) are small blisters on, or near the lips. They may burn, tingle, or itch. When first infected, there is usually a fever. Cold sores are caused by the herpes simplex virus (HSV). Herpes simplex virus, type 1 (HSV-1) usually affects the face (lips, nose, eyes), and herpes simplex virus, type 2 (HSV-2) usually affects the genital area. (HSV-1 is also called herpes labialis, and HSV-2 is also called herpes genitalis.) The virus is very contagious in the active phase (blisters present), and can also be spread when there are no blisters. After the initial infection subsides, the virus lies dormant in the neurons (nerve cells). The virus may then be stimulated into a new attack by fever, physical or emotional stress, exposure to sunlight, or certain foods or drugs. Outbreaks commonly last one to two weeks. HSV-2 can cause problems during pregnancy (spontaneous abortion, premature labor). It can also increase the risk for cervical cancer. Ocular herpes can lead to blindness.

VITAMINS & MINERALS*

More Helpful: zinc (oral and topical).

Less Helpful: vitamin A; vitamin C; vitamin E; selenium.

OTHER SUPPLEMENTS*

More Helpful: BHT; lemon balm (topical); lysine; propolis (topical); resveratrol.

Less Helpful: bioflavonoids.

HERBS*

More Helpful: aloe (topical); ginseng (Siberian); reishi mushroom.

Less Helpful: green tea (as tea); licorice (topical).

COMMENTS

Topical preparations are available to treat outbreaks (anesthetics, antivirals), as well as antiviral pills. Avoid foods that are high in the amino acid, arginine (nuts, seeds, chocolate).

*See individual listings for dosages and cautions.

Common Cold

OVERVIEW

The common cold is an acute, infectious disease of the upper respiratory tract (nose, sinuses, and throat). It is caused by one of many viruses, mostly of the rhinovirus group. Symptoms commonly include nasal congestion and discharge, sore throat, sneezing, coughing, headache, and fatigue. Adults usually do not get fevers. Cold viruses are spread via coughing and sneezing, and hand contact with the mucous membranes (eyes and nose). Adults commonly get one or two colds per year, while children get six to eight. Colds are self-limiting, usually lasting about one week.

VITAMINS & MINERALS*

More Helpful: vitamin C; zinc (lozenges).

Less Helpful: vitamin A.

OTHER SUPPLEMENTS*

More Helpful: propolis.

Less Helpful: thymus extract.

HERBS*

More Helpful: andrographis; astragalus; elderberry; garlic; ginseng (Panax and Siberian).

Less Helpful: echinacea; goldenseal.

COMMENTS

Decongestants and antihistamines are often used to treat nasal congestion. Herbal steam baths (eucalyptus or peppermint) are natural alternatives. During cold and flu season, make sure to stay hydrated by drinking plenty of water. Using humidifiers during the winter keeps the mucous membranes moist and reduces the likelihood of getting a cold. Also, wash your hand frequently, and keep your fingers away from your nose and eyes if you are around a sick person. Finally, consuming too much fat and sugar can depress the immune system, so eat sensibly, especially around the holidays when you may be traveling and are being exposed to people with colds.

*See individual listings for dosages and cautions.

Congestive Heart Failure

OVERVIEW

Congestive heart failure (CHF) manifests when the heart is unable to pump an adequate supply of blood to meet the body's metabolic needs. The failure can be in either the right or left ventricles of the heart. This leads to congestion in the lungs, heart, and veins. Symptoms include fatigue, difficulty in breathing, heart rhythm abnormalities (dysrhythmias), and edema. Causes of CHF include coronary artery disease, hypertension, bacterial or viral infections of the heart, and chemicals and drugs that damage the heart's valves.

VITAMINS & MINERALS*

More Helpful: magnesium.

Less Helpful: vitamin B1; vitamin C.

OTHER SUPPLEMENTS*

More Helpful: acetyl-L-carnitine; arginine; carnitine; CoQ10; creatine; propionyl-L-carnitine; taurine.

Less Helpful: omega-3 fatty acids (fish oil).

HERBS*

More Helpful: arjuna; astragalus; coleus forskohlii; hawthorn.

Less Helpful: ginkgo; Panax ginseng.

COMMENTS

Medications, such as inotropics, vasodilators, and diuretics, are used to assist the heart and reduce its workload. Avoid alcohol, caffeine, and nicotine, and reduce salt intake. Eat smaller, more frequent meals, instead of a few large meals. Check with your doctor to decide what kind and amount of exercise is appropriate.

*See individual listings for dosages and cautions.

Constipation

OVERVIEW

Constipation is a difficulty in defecation (bowel movement), resulting in feces that are hard and dry. Causes include diets that do not have enough fiber, insufficient fluid intake, irregular eating hours, excessive use of laxatives, lack of physical activity, or the voluntary avoidance of bowel movements. People may experience sluggishness, headache, and abdominal distension when they are constipated. Chronic constipation can result in impaction (inability to empty the rectum), which requires medical treatment.

VITAMINS & MINERALS*

More Helpful: magnesium.

Less Helpful: vitamin C.

OTHER SUPPLEMENTS*

More Helpful: glucomannan; guar gum; prebiotics; wheat bran.

Less Helpful:

HERBS*

More Helpful: aloe; artichoke (Jerusalem); cascara sagrada; flax seed (whole); psyllium; senna.

Less Helpful:

COMMENTS

Stool softeners and laxatives are used to treat constipation. Recommendations to preventing it include increasing intakes of raw fruits, raw vegetables, and water, plus regular exercise. When using soluble fibers (e.g., guar gum, psyllium), it is very important to drink plenty of water. Other important tips include maintaining regular bowel habits, and not resisting the urge to defecate.

*See individual listings for dosages and cautions.

Coronary Heart Disease

(Atherosclerosis; Coronary Artery Disease)

OVERVIEW

Coronary heart disease is the most common disease affecting the heart. It has a higher incidence in industrialized countries, most likely due to dietary (high fat, low fiber) and lifestyle (sedentary, smoking) choices. High blood pressure, diabetes, and obesity, are contributing factors. Besides elevated blood cholesterol, high levels of triglycerides, homocysteine, and C-reactive protein (CRP), are considered independent risk factors for CHD. The coronary arteries are less elastic, and the blood flow becomes restricted by deposits of plaque, which consist of cholesterol, connective tissue, calcium deposits, and blood platelets (used to form clots). The reduced blood flow can cause angina pectoris (pain in the heart). Heart attacks can be caused by a blood clot blocking a narrowed section of a coronary artery (myocardial infarction), and the lack of blood-delivered oxygen leads to muscle damage. (A similar process causes ischemic stroke.)

VITAMINS & MINERALS*

More Helpful: vitamins (B6, B12, folic acid, niacin, C); tocotrienols; magnesium.

Less Helpful: choline; gamma tocopherol; vitamin E; chromium; selenium; silicon.

OTHER SUPPLEMENTS*

More Helpful: arginine; EPA/DHA; lycopene; resveratrol; ribose.

Less Helpful: betaine; chondroitin sulfate; GLA; lipoic acid; policosanol; quercetin; taurine.

HERBS*

More Helpful: garlic; guggulipid; psyllium.

Less Helpful: bilberry; cordyceps; ginger; ginkgo; grape seed; grape skin; green tea; hawthorn; pomegranate; rhodiola; turmeric.

COMMENTS

Treatments include lowering cholesterol, reducing chance of blood clots, and lowering blood pressure. For blocked arteries, angioplasty may be done. Dietary changes (natural diet, low salt, high fiber, plenty of fruits, vegetables, whole grains, legumes), regular exercise, quitting smoking, and stress reduction, also help.

*See individual listings for dosages and cautions.

Depression

OVERVIEW

Depression is an emotional state with symptoms including persistent feelings of hopelessness, dejection, poor concentration, lack of energy and motivation, inability to sleep, and at the extreme, suicidal thoughts. Depression can be caused by hormonal imbalance, nervous system disorders, infection, medications, poor diet or food allergies, genetics (hereditary), or cancer. Mild depression may last for only a day or two, while major depression may last many months or years. Women are much more likely to suffer from depression than men.

VITAMINS & MINERALS*

More Helpful: folic acid.

Less Helpful: inositol; vitamin B6; vitamin B12.

OTHER SUPPLEMENTS*

More Helpful: 5-HTP; acetyl-L-carnitine; DHEA; omega-3 fatty acids (fish oil); phenylalanine; SAME; tryptophan; tyrosine.

Less Helpful: phosphatidylserine.

HERBS*

More Helpful: St. John's wort.

Less Helpful: ginkgo.

COMMENTS

Exercise, especially outdoors, may be the answer for mild depression. Major depression may require psychotherapy, antidepressants, and possibly ECT (electroconvulsive therapy). Biofeedback, meditation, and yoga, may also help. Avoid junk food, alcohol, caffeine, and nicotine, and instead follow a natural, nutritionally balanced diet.

*See individual listings for dosages and cautions.

Diabetes Mellitus

(Hyperglycemia)

OVERVIEW

Diabetes mellitus is a disease in which the pancreas fails to release enough insulin to meet the body's needs. Symptoms include excessive urination, thirst, hunger, and problems with fat and protein metabolism. There are two main types of diabetes. Type I diabetes (formerly called insulin-dependent diabetes or juvenile-onset diabetes) usually appears suddenly around puberty, and the pancreas stops producing insulin. Genetics and autoimmune disease are thought to be contributors to its cause. Type II diabetes (formerly called non-insulin-dependent diabetes or adult-onset diabetes) appears gradually, usually after the age of forty, and the body develops resistance to its insulin. Obesity is the primary cause of type II diabetes. If not treated properly, the disease can cause many problems, including cardiovascular and peripheral vascular disease, retinopathy, nephropathy, neuropathy, and impotence.

VITAMINS & MINERALS*

More Helpful: biotin; niacinamide (B3); chromium; magnesium.

Less Helpful: vitamin E; manganese; vanadium.

OTHER SUPPLEMENTS*

More Helpful: BCAA; CoQ10; glucomannan; guar gum; lipoic acid; omega-6 fatty acid (GLA).

Less Helpful: conjugated linoleic acid; quercetin; taurine.

HERBS*

More Helpful: bitter melon; cinnamon; fenugreek; ginseng (Panax); gymnema sylvestre; prickly pear cactus; psyllium.

Less Helpful: banaba; cordyceps; maitake mushroom; olive leaf.

COMMENTS

For type I diabetes, regularly checking insulin levels and frequent insulin injections are recommended. For type II diabetes, proper diet, weight loss, and regular exercise, can reverse the disease. Drinking coffee reduces the risk of getting type I diabetes.

*See individual listings for dosages and cautions.

Diarrhea

OVERVIEW

Diarrhea is a condition of frequent and excessive bowel movements of thin, watery feces. It is not a disease, but a symptom of many disorders and conditions, including food poisoning, bacterial and viral infections, spicy foods, excessive consumption of certain sugar substitutes, and anxiety. Intestinal disorders, such as Crohn's disease, ulcerative colitis, and irritable bowel syndrome, also cause diarrhea.

VITAMINS & MINERALS*

More Helpful:

Less Helpful:

OTHER SUPPLEMENTS*

More Helpful: colostrum; guar gum; prebiotics; probiotics; *Saccharomyces boulardii*.

Less Helpful:

HERBS*

More Helpful: goldenseal; psyllium.

Less Helpful: bilberry; blueberry; red raspberry leaf.

COMMENTS

Dehydration and loss of electrolytes (potassium, sodium, chloride) are complications associated with chronic diarrhea, and they need to be addressed with increased fluid and mineral intake. Avoid insoluble fiber (whole grains, especially wheat bran), but soluble fibers (guar gum, psyllium, pectin) are okay. Try bland foods, such as white rice and bananas.

*See individual listings for dosages and cautions.

Earache

OVERVIEW

Earache is a pain felt in the ear, and may be dull or sharp, and steady or periodic. Infections or disorders near the ear (nose, mouth, throat, and jaw) can cause pain in the ear. Accompanying the pain may be fever, nausea, vomiting, or diarrhea. Infections of the middle ear (otitis media) occur mostly in children, and are usually the result of a bacterial or viral infection of the upper respiratory tract. Allergies may also cause ear infections.

VITAMINS & MINERALS*

More Helpful:

Less Helpful: improve resistance (vitamin C; zinc).

OTHER SUPPLEMENTS*

More Helpful: xylitol (nasal spray, chewing gum, syrup).

Less Helpful:

HERBS*

More Helpful: eardrops (garlic oil, mullein flower oil).

Less Helpful:

COMMENTS

Analgesics may be used to treat the pain, and antibiotics used if there is an infection. Dependence on the regular use of antibiotics should be avoided. Children who get earaches often may have tubes inserted into their eardrum to reduce fluid buildup. Check for food allergies. Breast-fed babies are less likely to get ear infections (otitis media).

*See individual listings for dosages and cautions.

Eczema

(Dermatitis)

OVERVIEW

Eczema is not a specific disease, but an inflammatory skin condition classified into four types of dermatitis: atopic, contact, nummular, and seborrheic. Symptoms generally include redness, vesicles, crusting, scaling, and sometimes itching. The causes of dermatitis are often unknown. Atopic dermatitis may be caused by allergies. Contact dermatitis is caused by an irritant. Nummular dermatitis is more likely to appear in the winter months. Seborrheic dermatitis is connected with hereditary factors. Dermatitis is not contagious.

VITAMINS & MINERALS*

More Helpful:

Less Helpful: vitamin C; zinc.

OTHER SUPPLEMENTS*

More Helpful: essential fatty acids (omega-3 and omega-6); probiotics (for infants).

Less Helpful:

HERBS*

More Helpful:

Less Helpful: calendula (topical); licorice (topical); witch hazel cream (topical).

COMMENTS

Medications (antihistamines, corticosteroids) are usually prescribed to relieve itching and inflammation. Stress reduction techniques have shown to be helpful. Try removing allergenic foods (eggs, citrus, dairy, shellfish, soy, wheat, nuts) one at a time from the diet. Use natural skin care products.

*See individual listings for dosages and cautions.

Erectile Dysfunction

(Impotence)

OVERVIEW

Erectile dysfunction (ED) is defined as the inability of an adult male to achieve an erection for sexual penetration. It is classified into three types: anatomic (defective genitals; called primary impotence), atonic (disturbed neuromuscular function; called secondary impotence), and functional (psychological origin; also called secondary impotence). Besides psychological problems, secondary impotence can be the result of side effects from some medications (diuretics, antidepressants, hormones), diabetes, or vascular disease.

VITAMINS & MINERALS*

More Helpful:

Less Helpful:

OTHER SUPPLEMENTS*

More Helpful: arginine; DHEA.

Less Helpful:

HERBS*

More Helpful: Panax ginseng; yohimbe.

Less Helpful: cordyceps; ginkgo; muira puama; tribulus terrestris.

COMMENTS

Treatments may include surgical implants, prescription medications, and psychotherapy. Stop smoking and reduce alcohol consumption. Exercise regularly and practice relaxation techniques.

*See individual listings for dosages and cautions.

Fibrocystic Breast Disease

(Chronic Cystic Mastitis)

OVERVIEW

Fibrocystic breast disease is pain in the breasts (mastalgia) associated with lumps (cysts). Besides increased tenderness, symptoms include aching and swollen breasts. Symptoms usually appear one week before menstruation and disappear one week after menstruation. The cause is believed to be a hormonal imbalance between estrogen and progesterone. Women who have fibrocystic breast disease are at a greater risk for getting breast cancer.

VITAMINS & MINERALS*

More Helpful: iodine.

Less Helpful: vitamin B6 (PMS associated); vitamin E.

OTHER SUPPLEMENTS*

More Helpful: omega-6 fatty acid (GLA).

Less Helpful:

HERBS*

More Helpful: chasteberry.

Less Helpful: red clover (PMS associated).

COMMENTS

Avoiding caffeine (coffee, tea, chocolate, and soft drinks) can help reduce the symptoms.

*See individual listings for dosages and cautions.

Fibromyalgia

OVERVIEW

Fibromyalgia (FM) is a disorder characterized by muscle pain, fatigue, depression, insomnia, and headaches. Digestive problems, such as irritable bowel syndrome, may also be present. Fibromyalgia is similar to chronic fatigue syndrome, but the emphasis is more on muscle pain, not fatigue. The cause is unknown, but stress, inadequate sleep, neurotransmitter imbalances, and certain infections, may be contributing factors. Women are much more likely than men to get fibromyalgia.

VITAMINS & MINERALS*

More Helpful: magnesium.

Less Helpful: vitamin B12.

OTHER SUPPLEMENTS*

More Helpful: 5-HTP; malic acid; melatonin; SAME; tryptophan.

Less Helpful:

HERBS*

More Helpful: cayenne (topical).

Less Helpful: chlorella.

COMMENTS

Treatments, including analgesics, antidepressants, stress reduction (e.g., meditation), and exercise, can reduce the symptoms. Some forms of massage (trigger point, reflexology) may help. Get plenty of sleep, have a good diet, and reduce intake of alcohol, caffeine, and sugar. Supplements for chronic fatigue syndrome (CFS) may help when there is also fatigue present.

*See individual listings for dosages and cautions.

Flu

(Influenza)

OVERVIEW

Flu is an acute, viral disease primarily of the respiratory tract. Symptoms include chills, high fever, muscle aches and pains, fatigue, sore throat, chest pain, and headache. The common cold usually does not have the fever and fatigue associated with the flu, and does have the upper respiratory congestion that the flu usually does not have. The flu virus is easily passed from person to person, mainly in droplets expelled during sneezes and coughs. In susceptible individuals, a complication can be viral pneumonia or a secondary bacterial pneumonia.

VITAMINS & MINERALS*

More Helpful:

Less Helpful: vitamin C; vitamin D.

OTHER SUPPLEMENTS*

More Helpful: N-acetyl cysteine.

Less Helpful:

HERBS*

More Helpful: andrographis; elderberry; ginseng (Panax and Siberian).

Less Helpful: echinacea; garlic.

COMMENTS

Immunization, frequent hand washing, and avoiding infected individuals, reduce the chance of becoming infected. Drink plenty of fluids and get sufficient rest.

*See individual listings for dosages and cautions.

Gallstones

(Cholelithiasis)

OVERVIEW

Gallstones are found in the biliary tract, and consist of bile pigments and calcium salts. Excessive amounts of cholesterol and calcium in the bile, and reduced bile flow, contribute to gallstone production. Gallstones range in size from a pea to a golf ball. They are more common in diabetics, women, and African-Americans, and their likelihood increases with age. While many people will have no symptoms, others will experience general stomach discomfort, right-sided pain, jaundice, burping, and intolerance to certain foods (high fat).

VITAMINS & MINERALS*

More Helpful:

Less Helpful: phosphatidylcholine (lecithin); vitamin C.

OTHER SUPPLEMENTS*

More Helpful:

Less Helpful: methionine; omega-3 fatty acids (fish oil); psyllium; taurine.

HERBS*

More Helpful:

Less Helpful: chamomile; fennel; milk thistle; peppermint oil (enteric coated); turmeric (to prevent, not treat).

COMMENTS

Treatment includes surgery and ultrasound. Vegetarians are less likely to get gallstones. Increase fiber intake and reduce saturated fats (cheese, fried foods, red meat). Increase olive oil intake. Caffeine consumption (coffee and other caffeinated beverages) reduces gallstone risk. People who exercise regularly are less likely to get gallstones.

*See individual listings for dosages and cautions.

Gas

(Flatulence)

OVERVIEW

Flatulence is the presence of excessive amounts of gas in the stomach or intestines that is eventually expelled from the rectum as flatus. Other symptoms include stomach or intestinal bloat and pain. The origin of the gas is a combination of swallowed air (aerophagia) and a variety of gasses produced from incomplete food digestion. Foods that are high in fiber (whole grains), cruciferous vegetables (broccoli, cabbage, cauliflower), and the indigestible carbohydrates found in legumes (resistant starches, e.g., stachyose, raffinose), are more likely to produce gas.

VITAMINS & MINERALS*

More Helpful:

Less Helpful:

OTHER SUPPLEMENTS*

More Helpful:

Less Helpful: prebiotics; probiotics.

HERBS*

More Helpful:

Less Helpful: ginger.

COMMENTS

Slowly increasing high-fiber food intake reduces gas production. Digestive enzymes are also available that break down the indigestible carbohydrates found in legumes. Eat slowly to reduce the amount of swallowed air. Avoid carbonated beverages. Test to see if you are lactose intolerant (can't digest dairy products).

*See individual listings for dosages and cautions.

Glaucoma

OVERVIEW

Glaucoma is a condition of the eye defined by increased intraocular pressure. Most cases of glaucoma are open-angle (also called chronic simple glaucoma), and about 5% being closed-angle. When there are symptoms, they include frequent changes in eyeglass prescriptions, mild headaches, vague visual disturbances, halos around lights, and difficulty adjusting to darkness. Glaucoma is the leading cause of preventable blindness. Risk factors for glaucoma include old age, family history, being African-American, diabetes, and high blood pressure.

VITAMINS & MINERALS*

More Helpful:

Less Helpful: vitamin C; chromium; magnesium.

OTHER SUPPLEMENTS*

More Helpful:

Less Helpful: lipoic acid; omega-3 fatty acids (fish oil).

HERBS*

More Helpful: coleus forskohlii (eyedrops); ginkgo.

Less Helpful: bilberry.

COMMENTS

Treatment of glaucoma includes prescription eyedrops, and sometimes surgery. Carnosine-containing eyedrops may help. Marijuana (*Cannabis sativa*) contains a compound (THC) that can reduce intraocular pressure.

*See individual listings for dosages and cautions.

Gout

OVERVIEW

Gout is characterized by attacks of pain, often in the joints, and especially the big toe. Besides pain, joints may be red and swollen. Fever and chills may also accompany attacks of gout. The attacks, which last a few days to a week or more, are triggered by elevated levels of uric acid in the blood. Foods that are high in purines (e.g., high protein foods, including anchovies, herring, sardines, shellfish, legumes, liver and other organ meats, and poultry), asparagus, cauliflower, mushrooms, and spinach, increase uric acid levels. Alcohol (especially beer) also increases uric acid levels. Almost all cases of gout are found in men.

VITAMINS & MINERALS*

More Helpful:

Less Helpful: folic acid; vitamin C.

OTHER SUPPLEMENTS*

More Helpful:

Less Helpful: bromelain; chrysin; omega-3 fatty acids (fish oil); quercetin.

HERBS*

More Helpful:

Less Helpful:

COMMENTS

Medications (colchicine, indomethacin) are available. Dietary changes and increased water intake usually eliminate or reduce the attacks. So, increase water intake, reduce weight (if obese), and make the necessary dietary changes (see Overview above). Eating cherries and other berries may also lower uric acid levels.

*See individual listings for dosages and cautions.

Gum Disease

(Gingivitis; Periodontal Disease; Periodontitis)

OVERVIEW

Periodontal disease, also called gum disease, is a disease of the gums and bones that support the teeth. It begins when plaque builds up around the teeth. Bacteria in the plaque attack the gum tissue (gingiva), causing inflammation and recession of the tissue from the teeth. If the disease progresses, the periodontal ligament, which anchors the teeth to the bone, deteriorates, allowing the teeth to loosen. Left untreated, tooth loss can occur. Symptoms of periodontal disease include swollen gums that bleed easily, especially after flossing and brushing. Other symptoms include shrinkage of the gum tissue from the teeth, pus, and bad breath.

VITAMINS & MINERALS*

More Helpful: folic acid (topical).

Less Helpful: vitamin C.

OTHER SUPPLEMENTS*

More Helpful: CoQ10; propolis (topical).

Less Helpful: citrus bioflavonoids.

HERBS*

More Helpful: green tea (as tea).

Less Helpful:

COMMENTS

Preventive measures include brushing and flossing every day. Treatment includes plaque and tartar (calculus) removal by scraping (root planing and scaling) by a periodontist. Reduce intake of sweets, especially ones that are sticky.

*See individual listings for dosages and cautions.

Headaches

(Cluster; Migraine; Tension)

OVERVIEW

Headaches are classified into three main types: tension, migraine, and cluster. Tension headaches are by far the most common, and can be caused by muscle tension, minor trauma, stress or anxiety, allergies, sinus or ear infections, or eye strain. They are usually dull, on both sides of the head (bilateral), and do not throb. Migraines affect about 5% of the population, mostly women, and are often triggered by the hormonal changes around their menstrual periods. They may also be caused by allergies, diets high in carbohydrates or salt, foods containing tyramine (aged cheese, processed meat), nuts, beer, wine, whiskey, chocolate, and some fruit (bananas, citrus fruit). Usually preceded by a visual aura, the pain is on one side of the head (unilateral) and is throbbing. Cluster headaches are more common in men, also on one side of the head (often around the eye), with a deep, nonthrobbing pain. They usually are of shorter duration than migraines.

VITAMINS & MINERALS*

More Helpful: vitamin B2; magnesium.

Less Helpful: vitamin B5; calcium.

OTHER SUPPLEMENTS*

More Helpful: CoQ10; melatonin.

Less Helpful: 5-HTP; arginine; essential fatty acids (omega-3 and omega-6).

HERBS*

More Helpful: butterbur; feverfew.

Less Helpful: ginger; ginkgo.

COMMENTS

Analgesics (aspirin, acetaminophen, ibuprofen) usually help tension headaches. Migraines and cluster headaches usually require various prescription medications, such as triptans and ergot derivatives. Caffeine can help with simple headaches and migraines. Breathing pure oxygen can be helpful with cluster headaches. Aromatherapy with lavender or peppermint may help.

*See individual listings for dosages and cautions.

Heartburn

(Gastroesophageal Reflux; GERD)

OVERVIEW

Heartburn (acid reflux) is a condition of acidity in the esophagus. If the lower esophageal sphincter relaxes, it allows stomach acid to enter (regurgitate) the esophagus. Reflux can be caused by pregnancy, obesity, hiatal hernia, lifestyle (alcohol, coffee, smoking) or diet (fatty foods, chocolate, peppermint, large meals).

VITAMINS & MINERALS*

More Helpful: calcium; magnesium.

Less Helpful:

OTHER SUPPLEMENTS*

More Helpful:

Less Helpful: betaine HCl; mastic gum; melatonin.

HERBS*

More Helpful: licorice (DGL).

Less Helpful: aloe vera; chamomile; slippery elm.

COMMENTS

To reduce GERD, eat small evening meals, elevate the head of the bed, and make the necessary lifestyle and dietary changes (see Overview above). That is better than relying on antacids, which may interfere with protein digestion by neutralizing stomach acid.

*See individual listings for dosages and cautions.

Hemorrhoids

(Piles)

OVERVIEW

Hemorrhoids are enlarged veins in or around the rectum or anus. They are caused by pregnancy and constipation (straining at stool), and can be exacerbated by stress or sitting for long periods of time. Symptoms include pain, itching, and bleeding.

VITAMINS & MINERALS*

More Helpful:

Less Helpful: vitamin C; zinc.

OTHER SUPPLEMENTS*

More Helpful: citrus bioflavonoids (hesperidin, rutin).

Less Helpful:

HERBS*

More Helpful: butcher's broom; horse chestnut; psyllium; witch hazel (topical).

Less Helpful: bilberry; gotu kola.

COMMENTS

The most important goal is to maintain soft stools, primarily by increasing water and fiber intake. Stool softeners and topical preparations are available, and if they do not work, surgery is an option. Do not hold breath when lifting heavy objects.

*See individual listings for dosages and cautions.

Hepatitis

OVERVIEW

Hepatitis is inflammation of the liver. It can be caused by bacterial and viral infections, and by chronic exposure to alcohol, certain drugs, and toxic chemicals, such as paint thinners and aerosol sprays. Symptoms can range from none to many, including fatigue and weakness, lack of appetite, fever, and abdominal pain. Another symptom is jaundice, a yellowing of the skin and eyes that is the result of the liver's failure to break down bile pigments. The most common forms of hepatitis are caused by a variety of viruses, and they are classified alphabetically, hepatitis A virus to hepatitis E virus (HAV, HBV, HCV, HDV, HEV). The most common ways they are acquired are: HAV via the fecal to hand route (bathroom to kitchen), HBV mostly from sexual intercourse, and HCV from intravenous drug use. Other liver problems include cirrhosis and fatty liver.

VITAMINS & MINERALS*

More Helpful: phosphatidylcholine.

Less Helpful: vitamin B12; vitamin C; vitamin E; selenium.

OTHER SUPPLEMENTS*

More Helpful: taurine; thymus extract.

Less Helpful: lipoic acid; N-acetyl cysteine; SAME.

HERBS*

More Helpful: cordyceps; milk thistle; schisandra.

Less Helpful: astragalus; dandelion; green tea; licorice; picrorhiza; reishi mushroom; shiitake mushroom.

COMMENTS

Hepatitis can be prevented by cleanliness and proper food handling, safe sex, and not sharing IV needles. Vaccines are available for HAV and HBV. Avoid combining alcohol and acetaminophen (e.g., Tylenol), a combination that can lower glutathione in the liver. Avoid saturated fat and fried foods.

*See individual listings for dosages and cautions.

High Blood Pressure

(Hypertension)

OVERVIEW

High blood pressure is a medical condition, usually without symptoms, in which the arterial blood pressure consistently exceeds 140/90 mm Hg. (Optimal is below 120/80.) Basically it is a combination of too much blood volume and/or too narrow arteries. In most cases of hypertension (about 95%), the cause is unknown (idiopathic), but may be connected to genetic predisposition, race, obesity, smoking, stress, and a high-fat or high-sodium diet. This is called essential hypertension. In secondary hypertension, the cause is related to a medical condition, such as kidney disease, or endocrine or metabolic disorders. Two other forms of hypertension are malignant and preeclampsia (toxemia of pregnancy). If left untreated, hypertension can increase the likelihood of having a heart attack, stroke, or kidney failure.

VITAMINS & MINERALS*

More Helpful: calcium; magnesium; potassium.

Less Helpful: vitamin B6; vitamin C; vitamin E.

OTHER SUPPLEMENTS*

More Helpful: arginine; CoQ10; omega-3 fatty acids (fish oil); taurine.

Less Helpful: melatonin; omega-6 fatty acid (GLA); theanine.

HERBS*

More Helpful: garlic; hawthorn; olive (leaf & oil); psyllium; reishi mushroom.

Less Helpful: arjuna; coleus forskohlii; maitake mushroom; pine bark (pycnogenols).

COMMENTS

Treatment usually starts with the DASH diet (Dietary Approaches to Stop Hypertension) that includes changes to diet (less fat and salt, and more fresh fruit, vegetables, and low-fat dairy products) and lifestyle (lose weight, stop smoking, less alcohol, stress reduction, exercise more). Plenty of medications are available, including diuretics (water pills), beta-blockers, and ACE inhibitors. Do not stop taking medications unless directed so by your doctor.

*See individual listings for dosages and cautions.

High Cholesterol

(Hypercholesterolemia)

OVERVIEW

High cholesterol is a condition of having too much cholesterol in the blood. Cholesterol is a type of fat (sterol) found in animal fats and oils (not plants) that is a component of cell membranes, and is also converted into vitamin D, as well as steroid hormones (estrogen, testosterone, aldosterone), and bile acids. When blood levels are too high, it is usually because the body's liver is making too much of it. Cholesterol levels should be kept below 200 mg/dl. Low-density cholesterol (LDL-C) is often called the "bad" cholesterol, but it is necessary for life. However, when it becomes oxidized (ox-LDL-C), it has atherogenic properties, contributing to plaque buildup in the arteries.

VITAMINS & MINERALS*

More Helpful: tocotrienols; vitamin B3 (niacin); vitamin B5 (pantethine); calcium; magnesium.

Less Helpful: chromium.

OTHER SUPPLEMENTS*

More Helpful: beta-glucans; beta-sitosterol; flaxseed; glucomannan; guar gum; soy isoflavonoids.

Less Helpful: arginine; chitosan; citrus bioflavonoids; conjugated linoleic acid; CoQ10; policosanol; omega-3 fatty acids (fish oil); gamma oryzanol; guggulipid; inositol hexaphosphate.

HERBS*

More Helpful: red yeast rice (take with CoQ10); psyllium.

Less Helpful: artichoke (globe); chlorella; cordyceps; garlic; ginger; green tea; pine bark (pycnogenols); reishi mushroom.

COMMENTS

Dietary recommendations include decreasing intakes of saturated fat and *trans*-fatty acids, and increasing intakes of monounsaturated fat and fiber. Statin drugs decrease the body's production of cholesterol by inhibiting an enzyme in the pathway for cholesterol synthesis. Unfortunately, they also reduce synthesis of coenzyme Q10.

*See individual listings for dosages and cautions.

High Homocysteine

(Hyperhomocysteinemia)

OVERVIEW

Homocysteine is produced from the sulfur-containing amino acid, methionine. (Methionine is also responsible for producing cysteine, SAMe, and taurine.) Elevated levels of homocysteine can contribute to the clogging of arteries. Therefore, homocysteine is considered to be an independent risk factor for causing coronary heart disease (atherosclerosis). Fortunately, homocysteine can be converted back to methionine when there are sufficient levels of three B-vitamins: B6, B12, and folic acid.

VITAMINS & MINERALS*

More Helpful: choline; folic acid; vitamin B6; vitamin B12.

Less Helpful: vitamin B2.

OTHER SUPPLEMENTS*

More Helpful: betaine (TMG).

Less Helpful: N-acetyl cysteine.

HERBS*

More Helpful:

Less Helpful:

COMMENTS

Usually a moderate to high potency multivitamin supplement will contain enough of the B-vitamins to keep homocysteine in check. If needed, there are supplements containing just the ingredients for lowering homocysteine levels. These should be taken in addition to a multivitamin supplement, especially if it is a low potency one. New research shows that vitamin B2 (riboflavin) may lower homocysteine in some people.

*See individual listings for dosages and cautions.

High Triglycerides

(Hypertriglyceridemia)

OVERVIEW

High triglycerides is a condition of having too many triglycerides in the blood. Triglycerides are compounds made up of three fatty acids (oleic, palmitic, or stearic) and glycerol. Factors that can elevate blood triglycerides include a refined carbohydrate diet, alcohol, obesity, untreated diabetes or hypothyroidism, chronic renal disease, and liver disease. Elevated triglyceride levels increase the risk for coronary heart disease. Triglyceride levels should be kept below 150 mg/dl.

VITAMINS & MINERALS*

More Helpful: niacin; vitamin B5 (pantethine).

Less Helpful: chromium.

OTHER SUPPLEMENTS*

More Helpful: acetyl-L-carnitine; L-carnitine; omega-3 fatty acids (fish oil, flaxseeds); policosanol.

Less Helpful: conjugated linoleic acid; gamma oryzanol; guar gum; IP6; omega-6 fatty acid (GLA).

HERBS*

More Helpful: artichoke; garlic; red yeast rice.

Less Helpful: fenugreek; glucomannan; green tea; psyllium.

COMMENTS

Steps to reduce triglycerides include reducing intakes of sweets (including very sweet and dried fruit), other refined carbohydrates, fat, and alcohol, weight reduction (if overweight), and increasing activity levels. Blood tests can be influenced by what was recently eaten (also by alcohol and exercise), so you may not want to rely on the results of only one test.

*See individual listings for dosages and cautions.

HIV/AIDS

(Human Immunodeficiency Virus)

OVERVIEW

HIV/AIDS is a virus and disease process. HIV (Human Immunodeficiency Virus) takes over one type of immune cell (T-helper cell lymphocyte), leading to immunosuppression and a lowering of the body's main defense mechanism against intracellular pathogens and the formation of malignant tumors. This process may take several months or as long as 10 to 15 years, and is classified into four stages. The final, life threatening stage, is called AIDS (Acquired Immunodeficiency Syndrome). HIV is contracted through unprotected sex with an infected partner, the sharing of hypodermic needles, or from infected mother to baby. There is no cure for HIV/AIDS, but combinations of drugs slow the progression of the disease.

VITAMINS & MINERALS*

More Helpful: vitamin C; vitamin E; selenium; zinc.

Less Helpful: vitamin B12.

OTHER SUPPLEMENTS*

More Helpful: acetyl-L-carnitine; beta-glucans; CoQ10; DHEA; glutamine; glutathione; L-carnitine; N-acetyl cysteine.

Less Helpful: AHCC; essential fatty acids (omega-3 & omega-6); lipoic acid; prebiotics; probiotics; SAmE; thymus extract.

HERBS*

More Helpful: licorice; shiitake mushroom (injected lentinan extract); turmeric.

Less Helpful: bitter melon; chrysin; garlic; maitake mushroom; milk thistle; reishi mushroom.

COMMENTS

To offset weight loss (of lean body mass), extra protein is necessary. Whey protein is particularly helpful, plus it contains immune factors, branched chain amino acids, and glutamine. Also take a high potency multivitamin supplement (e.g., 6 pill/day formula).

*See individual listings for dosages and cautions.

Hives

(Urticaria)

OVERVIEW

Hives is an allergic reaction that produces wheals, temporary raised areas on the skin, which are usually red and itchy. Hives may be caused by food allergies (shellfish, eggs, nuts, fruit), some medications (aspirin, penicillin, insulin), insect bites (bed bugs, lice), clothing materials (silk, wool), or chronic emotional stress.

VITAMINS & MINERALS*

More Helpful:

Less Helpful: vitamin B12; vitamin C.

OTHER SUPPLEMENTS*

More Helpful:

Less Helpful: quercetin.

HERBS*

More Helpful:

Less Helpful:

COMMENTS

Besides avoiding the offending materials or conditions, antihistamines can help reduce the allergic response. Avoid food and beverages containing artificial ingredients (color, flavor, preservatives). Reduce stress with relaxation techniques. Try creams or lotions with chamomile or aloe vera.

*See individual listings for dosages and cautions.

Immune Function

(Immunodepression; Infection)

OVERVIEW

Immune function can be compromised when the main organs of the immune response system (bone marrow, thymus, and lymphoid tissues) are not functioning properly. These organs produce a variety of immune components, including neutrophils, lymphocytes, macrophages, immunoglobulins, and interferon. A poorly operating immune system results in frequent bacterial, viral, or fungal infections, allergies, and even cancer. Factors that can depress the immune system include inborn errors (genetic defects), alcohol and drug abuse, certain medications (chemotherapy, corticosteroids), certain viral infections (Epstein-Barr, HIV), smoking, chronic stress, poor sleep, too little or too much exercise, trauma, burns, and a poor diet. The immune system can also turn against the body, causing diseases such as lupus, multiple sclerosis, rheumatoid arthritis, and type-1 diabetes.

VITAMINS & MINERALS*

More Helpful: vitamin A; vitamin C; vitamin E; selenium; zinc.

Less Helpful: copper.

OTHER SUPPLEMENTS*

More Helpful: probiotics; glutamine; licorice; N-acetyl cysteine; propolis; thymus extract.

Less Helpful: AHCC; arginine; bromelain; colostrum; DHEA; dimethylglycine; inosine; resveratrol.

HERBS*

More Helpful: andrographis; ashwaganda; cordyceps; garlic; ginseng (Panax and Siberian); olive leaf.

Less Helpful: astragalus; cat's claw; chlorella; echinacea; goldenseal; larch arabinogalactan; mushrooms (maitake, reishi, shiitake); pau d'arco.

COMMENTS

The supplements listed above either strengthen the immune system, stimulate it, or directly act on various pathogenic organisms. Whey protein contains immune factors that benefit the immune system. A natural diet, moderate exercise, plenty of sleep, and various relaxation techniques, will support the immune system.

*See individual listings for dosages and cautions.

Infertility, Female

OVERVIEW

Female infertility is the inability of not being able to conceive or to carry a child to term. Infertility may be present in one or both sex partners. In the case of female infertility, it may be a matter of structural abnormalities or hormonal imbalances. Structural abnormalities include anatomical irregularities that were present at birth, or developed later as a result of infections (chlamydia, gonorrhea), inflammation, or endometriosis, that scar the fallopian tubes and prevent sperm from reaching the egg. Fibroid tumors and polyps can prevent a fertilized egg from implanting in the uterine wall. Hormonal imbalances can affect the menstrual cycle and inhibit the release of an egg for fertilization. This can be caused by diabetes, thyroid disease, and polycystic ovarian syndrome, or by the use of drugs, excessive alcohol or caffeine intake, or cigarette smoking. Finally, age affects fertility.

VITAMINS & MINERALS*

More Helpful:

Less Helpful: vitamin C.

OTHER SUPPLEMENTS*

More Helpful:

Less Helpful: DHEA.

HERBS*

More Helpful: chasteberry.

Less Helpful:

COMMENTS

Normal weight, not smoking, and moderate exercise, help with female infertility problems. After sex, lie on back and stay in bed for at least 15 minutes.

*See individual listings for dosages and cautions.

Infertility, Male

OVERVIEW

Male infertility is the inability of not being able to conceive a child. Infertility may be present in one or both sex partners. In the case of male infertility, it may be a matter of sperm abnormalities, structural problems, or medical disorders. Sperm abnormalities, which may be genetic, include low sperm count and the quality of the sperm (poor motility or cannot penetrate the egg). Contaminants, such as heavy metals and pesticides, can affect sperm quality. Structural problems include varicocele and blocked vas deferens, which influence the delivery of the sperm. Medical disorders affecting male infertility include scarring that was caused by sexually transmitted infections (STIs) and other infections. Medications for high blood pressure and depression can cause erectile dysfunction. Low hormonal levels can also reduce sperm levels. Finally, age affects fertility.

VITAMINS & MINERALS*

More Helpful: folic acid; vitamin B12; vitamin E; zinc.

Less Helpful: selenium.

OTHER SUPPLEMENTS*

More Helpful: acetyl-L-carnitine; arginine; CoQ10; L-carnitine.

Less Helpful: glutathione.

HERBS*

More Helpful: Panax ginseng.

Less Helpful: astragalus.

COMMENTS

Increase fertility by not smoking or drinking excessive alcohol. Also, have a natural diet, and wear loose-fitting underwear (overheated testicles produce less sperm).

*See individual listings for dosages and cautions.

Inflammation

OVERVIEW

Inflammation is the response of the body's tissues to irritation, infection, or injury. There is increased blood flow to the injured site, causing it to become red (rubor) and swollen (tumor). Other symptoms include heat (calor) and pain (dolor). Carried within the blood are white blood cells (lymphocytes) and macrophages. Contributing to the inflammatory response are substances called histamine, leukotrienes, kinins, and prostaglandins. Pretty much any condition that ends in "itis" involves inflammation. Examples include arthritis, bursitis, colitis, conjunctivitis, dermatitis, diverticulitis, gastritis, gingivitis, hepatitis, interstitial cystitis, nephritis, neuritis, pancreatitis, pharyngitis, phlebitis, prostatitis, sinusitis, tendonitis, thyroiditis, tonsillitis, ulcerative colitis, and vaginitis. Excessive inflammation is now thought to be a contributory factor in coronary heart disease (atherosclerosis).

VITAMINS & MINERALS*

More Helpful:

Less Helpful: gamma tocopherol; vitamin E.

OTHER SUPPLEMENTS*

More Helpful: bromelain; chondroitin sulfate; citrus bioflavonoids; essential fatty acids (omega-3 and omega-6); propolis; quercetin; serrapeptase.

Less Helpful: cetyl myristoleate; glucosamine sulfate; guggulipid; inosine.

HERBS*

More Helpful: cat's claw; ginger; milk thistle; skullcap; turmeric.

Less Helpful: boswellia; chamomile; devil's claw; echinacea; feverfew; ginkgo; gotu kola; grape seed; green tea; kava; licorice.

COMMENTS

Aspirin and NSAIDs (nonsteroidal anti-inflammatory drugs) are commonly used to relieve pain and reduce inflammation. Have a diet that is high in omega-3 fatty acids (fish), and lower in polyunsaturated vegetable oils (switch to olive oil).

*See individual listings for dosages and cautions.

Inflammatory Bowel Disease

(Crohn's Disease; Ulcerative Colitis; Ulcerative Proctitis)

OVERVIEW

Inflammatory bowel disease (IBD) is a long-term disease of unknown cause. The two most common kinds of IBD are Crohn's Disease (CD) and Ulcerative Colitis (UC). Crohn's disease most often affects the lower part of the small intestine (the large intestine can also be involved), whereas ulcerative colitis is confined to the colon (large intestine), or just the rectum (ulcerative proctitis). Symptoms include many attacks of diarrhea, severe stomach pain, nausea, fever, chills, weakness, appetite loss, and weight loss. American and European Jews are at greatest risk for inflammatory bowel disease, sometimes just called colitis. If left untreated, IBD can increase the risk for colon cancer.

VITAMINS & MINERALS*

More Helpful: folic acid (UC); zinc (CD).

Less Helpful:

OTHER SUPPLEMENTS*

More Helpful: glutamine (UC); N-acetyl-glucosamine (IBD); omega-3 fatty acids (IBD); probiotics (IBD); *Saccharomyces boulardii* (CD).

Less Helpful: chitosan (CD); colostrum (UC); quercetin (IBD).

HERBS*

More Helpful: aloe vera (UC); boswellia (IBD); psyllium (UC).

Less Helpful: chamomile (IBD); DGL licorice (IBD); ginger (IBD).

COMMENTS

Conventional treatment includes anti-inflammatory (corticosteroids) and antidiarrheal drugs, and possibly surgery to remove diseased sections of the intestines. Nutritional support is needed to replace nutrients lost because of malabsorption (fat-soluble vitamins and some minerals). Food allergens can cause inflammation, so try to determine if you are allergic to a food (e.g., corn, dairy, soy, wheat). Reduce intake of refined carbohydrates. Drink sufficient water to avoid dehydration. Try various stress reducing techniques.

*See individual listings for dosages and cautions.

Insomnia

OVERVIEW

Insomnia is the condition in which a person has a chronic inability to fall asleep, or to remain asleep throughout the night. It can be caused by various physical and psychological factors. Physical factors include an overactive thyroid, diabetes, muscle twitching, or consumption of caffeine-containing products (coffee, black and green tea, cocoa, chocolate, some soft drinks) before going to bed. Some cold, allergy, and headache medications also contain caffeine. Psychological factors include problems that produce anxiety, irrational fears, and tensions. Naps during the day, and not being exposed to sufficient daylight, can also contribute to insomnia.

VITAMINS & MINERALS*

More Helpful:

Less Helpful: calcium; magnesium.

OTHER SUPPLEMENTS*

More Helpful: 5-HTP; GABA; melatonin; tryptophan.

Less Helpful:

HERBS*

More Helpful: hops; kava; passionflower; skullcap; valerian.

Less Helpful: chamomile; St. John's wort.

COMMENTS

Treatments include medications (for short-term use only), psychotherapy, and exercise. Exposure to full-spectrum light during the day can reset the body's biological clock (circadian rhythm), allowing for greater release of melatonin by the pineal gland at night. Keep the bedroom very dark at night. Avoid alcohol, caffeine (sodas and tea), chocolate, and tobacco. Try to have a regular sleep schedule, every night, including the weekends. Do not read or watch television in bed. Exercise during the day. Try meditation, yoga, or aromatherapy (lavender).

*See individual listings for dosages and cautions.

Irritable Bowel Syndrome

(Spastic Colon)

OVERVIEW

Irritable bowel syndrome (IBS), also commonly called spastic colon, is a disorder affecting the small and large intestines. For some reason, the intestines suffer from hypermotility, and food moves too quickly through them. Symptoms include painless diarrhea after meals, or alternating painful constipation and diarrhea. Other symptoms include bloating, flatulence, and fatigue. While there is no known cause, emotional stress seems to be the primary factor, with diet, drugs, and GI hormones possibly having roles, too. More women than men are likely to have IBS.

VITAMINS & MINERALS*

More Helpful:

Less Helpful:

OTHER SUPPLEMENTS*

More Helpful: guar gum; prebiotics; probiotics.

Less Helpful: glutamine.

HERBS*

More Helpful: artichoke (globe); peppermint oil (enteric coated); psyllium.

Less Helpful: aloe vera; chamomile.

COMMENTS

Conventional treatment includes using antidiarrheal drugs and bulk-forming agents. Medication to relieve anxiety, or stress-reducing activities, may also help. Determine if you are lactose intolerant (not IBS), and if so, avoid dairy or take lactase enzyme products. Gradually increase the soluble fiber content of your diet. Avoid alcohol, caffeine, and spicy and fatty foods. Eat slowly and have smaller, more frequent meals. Check to see if you have food allergies. Try various relaxation techniques.

*See individual listings for dosages and cautions.

Kidney Stones

(Renal Calculi)

OVERVIEW

Kidney stones consist of a variety of elements (calcium, phosphates, oxalates, urates) that crystalized in the urine while in the kidney. When they leave the kidney, depending on the size of the stones, pain may be felt in various areas, including the groin, stomach area, and lower back. Fever, chills, and nausea may accompany the pain. Causes of kidney stones include urinary tract infections, dehydration, deficiencies of vitamin A, vitamin B6, and magnesium, and excesses of vitamin D and foods rich in calcium oxalate, such as chocolate, tea, and spinach. People who have gout are at a greater risk for getting kidney stones.

VITAMINS & MINERALS*

More Helpful: vitamin B6; magnesium.

Less Helpful: potassium.

OTHER SUPPLEMENTS*

More Helpful: IP-6.

Less Helpful:

HERBS*

More Helpful:

Less Helpful: burdock.

COMMENTS

While small stones may pass (with or without pain), large stones can block the ureters, resulting in infection or worse. Removing these stones requires chemical solvents or surgery. Extracorporeal shock wave lithotripsy, which breaks up the stones, is used if they are small enough. Drink plenty of water. If your stones are comprised of oxalates, avoid foods containing oxalic acid, such as almonds, asparagus, beets, bell peppers, black tea, celery, chocolate, egg plant, green beans, grapes, grapefruit, parsley, peanuts, rhubarb, and strawberries. If your stones are comprised of urates, avoid foods containing uric acid, such as anchovies, brewer's yeast, herring, organ meats, and sardines (in general, eat a low protein diet). Also avoid alcohol, especially beer.

*See individual listings for dosages and cautions.

Low Blood Sugar

(Hypoglycemia)

OVERVIEW

Low blood sugar occurs when there is a less-than-normal amount of sugar in the blood, usually below 70 mg/dL. One type of hypoglycemia occurs when a diabetic injects too much insulin. More commonly, though, is a type called reactive, or functional, hypoglycemia. Reactive hypoglycemia results from the body producing too much insulin, usually three to five hours after a meal. Symptoms include weakness, shakiness, anxiety, dizziness, sweating, rapid heart beat, poor concentration, headaches, food cravings, drowsiness, tingling in hands and feet, and depression. Some alternative health practitioners believe that stress or allergies can contribute to hypoglycemia. The adrenaline (epinephrine) produced as a result of stress or anxiety, can produce the symptoms of low blood sugar.

VITAMINS & MINERALS*

More Helpful: chromium.

Less Helpful: magnesium.

OTHER SUPPLEMENTS*

More Helpful:

Less Helpful:

HERBS*

More Helpful:

Less Helpful:

COMMENTS

Recommendations include avoiding caffeine, nicotine, alcohol, and refined carbohydrates (sweets, including fruit juice, and white flour products), and increasing protein and wholegrain foods. Legumes, which contain soluble fiber, are particularly good. It is also advisable to eat smaller, more frequent, meals.

*See individual listings for dosages and cautions.

Lupus

(Systemic Lupus Erythematosus; SLE)

OVERVIEW

Lupus has no known cause, but it is considered to be an autoimmune disease. The body produces antibodies to its own tissues, inducing inflammation, and causing damage to many organs and systems. Symptoms include arthritis, a butterfly-like rash on the nose and cheeks, fatigue, sensitivity to sunlight, headache, fever, weight loss, and skin sores with related hair loss. Organs affected can include the kidneys, lungs, heart, and nervous system. The disease often cycles between remissions and flare-ups. About nine times more women than men get lupus, and three times more blacks than whites.

VITAMINS & MINERALS*

More Helpful:

Less Helpful: vitamin A; vitamin B5; vitamin B12; vitamin D; vitamin E; magnesium; selenium.

OTHER SUPPLEMENTS*

More Helpful: DHEA; flaxseeds; omega-3 fatty acids (fish oil).

Less Helpful: omega-6 fatty acid (GLA).

HERBS*

More Helpful:

Less Helpful:

COMMENTS

Conventional treatment includes aspirin and NSAIDs for mild flare-ups, and stronger anti-inflammatory medications (corticosteroids) for more severe episodes. Antimalarial drugs are sometimes given to treat skin sores, but they can damage the eyes if used too much. It is also recommended that lupus patients should avoid sunlight, eat a healthy diet, exercise, and avoid stress.

*See individual listings for dosages and cautions.

Macular Degeneration

OVERVIEW

Macular degeneration, also called age-related macular degeneration (AMD or ARMD), affects the macula, which is a small spot located at the center of the eye's retina. It allows for focused, straight-ahead vision. When the macula becomes damaged, vision needed for reading and seeing fine details is gradually lost. There are two forms of AMD. The dry form is the most common (about 90%), progresses slowly, and is less severe. The wet form has abnormal growth of blood vessels beneath the macula, causing more rapid and extensive cell damage. People at greater risk for AMD include those with light-colored eyes, and those with diabetes, heart disease, or high blood pressure. Heredity, smoking, being female, and spending a lot of time in sunlight, are also risk factors.

VITAMINS & MINERALS*

More Helpful: beta-carotene; vitamin C; vitamin E; zinc.

Less Helpful: selenium.

OTHER SUPPLEMENTS*

More Helpful: lutein; omega-3 fatty acid (DHA); zeaxanthin.

Less Helpful: taurine.

HERBS*

More Helpful: ginkgo.

Less Helpful: bilberry; grape seed.

COMMENTS

There is no conventional treatment for the dry form, but antioxidants are thought to slow its progression. If done before there is significant damage, surgery can help with the wet form. Eat a colorful diet containing vegetables and fruit, especially berries. Wear sunglasses with UV protection when outdoors.

*See individual listings for dosages and cautions.

Memory Loss

(Alzheimer's Disease; Senile Dementia)

OVERVIEW

Memory loss can be caused by alcoholism, depression, and stroke, but the focus here is primarily on the severe form called Alzheimer's disease or senile dementia. The incidence of Alzheimer's disease increases dramatically from people in their 60s to their 80s. It is a gradual and progressive disease, starting with symptoms of short-term memory loss, to becoming paranoid or delusional, and being unable to carry on a normal conversation. The time from diagnosis to death ranges from five to fifteen years. Involved in the brain's destruction are amyloid plaque and neurofibrillary tangles. Family history increases the risk, and high blood pressure, atherosclerosis, inflammation, and a high-fat diet, can contribute to the disease.

VITAMINS & MINERALS*

More Helpful: choline (CDP or GPC); folic acid; vitamin B1; vitamin B3; vitamin B12; vitamin E.

Less Helpful: vitamin C; zinc.

OTHER SUPPLEMENTS*

More Helpful: acetyl-L-carnitine; DHEA; huperzine A; idebenone; NADH; phosphatidylserine; vinpocetine.

Less Helpful: carnosine; CoQ10; lipoic acid; melatonin; N-acetyl cysteine; pregnenolone; SAME; taurine.

HERBS*

More Helpful: ginkgo.

Less Helpful: astragalus; bacopa; cat's claw; ginseng (Panax and Siberian); gotu kola; lemon balm; rhodiola.

COMMENTS

There is no known cure for Alzheimer's disease. Treatment has focused on increasing neurotransmitters, especially acetylcholine. Patients have lower brain voltage, and dopamine precursors (phenylalanine, tyrosine) may help. Antioxidants may slow the disease's progression. Exercise both the body and the mind (memory exercises, crossword puzzles, etc.). Have a natural diet that is low in fat, especially fried foods that contain *trans*-fatty acids. Fish that is low in mercury is good.

*See individual listings for dosages and cautions.

Menopause

OVERVIEW

Menopause marks the permanent end of menstruation and fertility in women, usually between ages 45 and 55. The ovaries stop egg production, and the production of the hormone, estrogen, greatly declines. Besides the cessation of their periods, some women may experience hot flashes, heavy sweating, heart palpitations, and vaginal dryness. There may be some psychological symptoms, including depression and mood swings. To relieve some of the menopausal symptoms, synthetic hormones, including estrogen and progestin, may be prescribed. Since hormonal therapy can increase the risk of breast cancer, heart attacks, strokes, and blood clots, its use should be considered wisely. While vaginal dryness can affect sexual intercourse, sexual desire may decrease or increase.

VITAMINS & MINERALS*

More Helpful:

Less Helpful: vitamin C; vitamin E.

OTHER SUPPLEMENTS*

More Helpful: DHEA; flaxseeds; gamma oryzanol; soy isoflavonoids.

Less Helpful: bioflavonoids (hesperidin).

HERBS*

More Helpful: black cohosh.

Less Helpful: dong quai; kava; Panax ginseng; red clover.

COMMENTS

Dietary and lifestyle changes, such as reducing alcohol, caffeine, and salt, stopping smoking, and increasing exercise, can improve the whole menopausal experience. Topical preparations of progesterone cream may also reduce some menopausal symptoms.

*See individual listings for dosages and cautions.

Metabolic Syndrome

(Insulin Resistance Syndrome; Syndrome X)

OVERVIEW

Metabolic Syndrome (also called Insulin Resistance Syndrome and Syndrome X) is a combination of metabolic disorders that increases the risk for cardiovascular disease, and possibly cancer and other illnesses. The signs are insulin resistance, abnormal blood lipids (high total cholesterol and triglycerides, and low HDL cholesterol), high blood pressure, and obesity (especially fat around the belly or apple-shaped). Sedentary lifestyle (little or no exercise), stress, smoking, as well as poor dietary habits (high sugar, fat, and salt, and low fiber), contribute to metabolic syndrome. The effect this syndrome has on health fits the expression, "The whole is greater than the sum of its parts."

VITAMINS & MINERALS*

More Helpful: biotin; vitamin D; chromium; magnesium; vanadium.

Less Helpful: vitamin E; zinc.

OTHER SUPPLEMENTS*

More Helpful: DHEA; lipoic acid; omega-3 fatty acids (fish oil); soluble fiber (e.g., glucomannan, guar gum, psyllium).

Less Helpful: arginine; CoQ10; L-carnitine.

HERBS*

More Helpful: cinnamon.

Less Helpful: bitter melon; gymnema sylvestre.

COMMENTS

The primary focus of treatment for metabolic syndrome is reducing insulin resistance. Weight loss, through dietary improvements (fewer refined carbs and less saturated fat, and more soluble fiber) and increased exercise, go a long way to achieving that goal. Also avoid alcohol and nicotine. For the other areas of concern (high cholesterol, high triglycerides, high blood pressure), go to their individual listings for the supplements that may be helpful.

*See individual listings for dosages and cautions.

Mitral Valve Prolapse

OVERVIEW

Mitral valve prolapse (MVP) occurs when one or both leaflets of the mitral valve do not close properly. This causes a small amount of blood to leak back into the left atrium, instead of completely flowing forward into the left ventricle. (Blood enters the heart at the right atrium, then goes to the right ventricle, the lungs, the left atrium, the left ventricle, and then leaves the heart.) With a stethoscope, this can be heard as a click or murmur. The cause of MVP is unknown, and about 5% to 10% of the population has this condition, most of them being women. Usually there are no symptoms, but some people may experience chest pain, weakness, or irregular heart beats.

VITAMINS & MINERALS*

More Helpful: magnesium.

Less Helpful:

OTHER SUPPLEMENTS*

More Helpful: CoQ10.

Less Helpful: L-carnitine.

HERBS*

More Helpful:

Less Helpful:

COMMENTS

With MVP, there is a greater risk for the mitral valve becoming infected, so antibiotics are usually recommended before surgery or dental work.

*See individual listings for dosages and cautions.

Multiple Sclerosis

OVERVIEW

Multiple sclerosis (MS) is a disease of the central nervous system, where there is a loss of the myelin (fatty, protective coating) that covers the nerves in the brain and spinal cord. Nerve transmission becomes slowed or interrupted. Initial symptoms include numbness, tingling, weakness, dizziness, and visual disturbances. The disease can progress to include other symptoms, such as dementia, loss of bowel and bladder control, and inability to stand and walk. The cause of MS is unknown, but genetics and a faulty immune system are suspected. There are four categories of MS, based on how the disease progresses, and the on-again (relapse) and off-again (remitting) cycles of symptoms.

VITAMINS & MINERALS*

More Helpful: vitamin D; magnesium.

Less Helpful: vitamin B12; vitamin E; selenium.

OTHER SUPPLEMENTS*

More Helpful:

Less Helpful: Ca-AEP; essential fatty acids (omega-3 and omega-6).

HERBS*

More Helpful:

Less Helpful: ginkgo; turmeric.

COMMENTS

There is no cure for MS, and few drugs are available for treatment. Corticosteroids are used to shorten the duration of acute attacks, muscle relaxants for spasticity, and other drugs for bladder problems and fatigue. Exercise regularly, but gently. Do not exercise during an attack. Stretching, especially yoga, can be helpful. Avoid excessive heat, or becoming overheated. Some foods may trigger an attack (e.g., dairy, grains containing gluten, vinegar, wine), so keep a record of the foods eaten before an attack. The Swank Diet was developed by Roy Swank, M.D., for people with MS. Some people use bee venom therapy (make sure you are not allergic to bee stings), although little scientific research supports its use.

*See individual listings for dosages and cautions.

Nausea

(Morning Sickness; Motion Sickness)

OVERVIEW

Nausea is the feeling that precedes the urge to vomit. It may be caused by gastroenteritis (food poisoning, bacterial or viral infections), emotional stress and anxiety, early pregnancy, gallstones, Crohn's disease, migraines, and heart attack. Another major source of nausea is motion sickness, which is caused by excessive stimulation of the semicircular canals in the inner ear. The uneven or rhythmic motions associated with ships, airplanes, and automobiles generate the stimulation that can cause motion sickness.

VITAMINS & MINERALS*

More Helpful: vitamin B6 (morning sickness).

Less Helpful:

OTHER SUPPLEMENTS*

More Helpful:

Less Helpful:

HERBS*

More Helpful: ginger; peppermint.

Less Helpful:

COMMENTS

Medications are available that can reduce the sensitivity of the motion-detecting nerves in the ear. Also for motion sickness, sit in the middle of the bus, ship, or airplane, and do not read. Eat light, low fat, starchy meals. There are acupressure points for relieving nausea. Avoid strong odors, such as tobacco smoke, perfumes, and cleaning supplies.

*See individual listings for dosages and cautions.

Neuropathy

OVERVIEW

Neuropathy is an ailment of the peripheral nervous system (PNS) characterized by swelling and degeneration of the nerves. The PNS is made up of three types of nerves: motor (voluntary movement), sensory (sensing temperature, pain, touch, and limb positioning), and autonomic (involuntary functions, including breathing, blood pressure, sexual function, and digestion). Neuropathy has many causes, including diabetes, nutritional deficiencies (vitamins B1, B12), alcohol, poisons, heavy metals (arsenic, lead, mercury), autoimmune diseases (Guillain-Barré syndrome), carpal tunnel syndrome, heredity, and some medications. The primary symptoms are numbness and tingling in the hands and feet, burning pain, and muscle weakness, but organ systems can also be affected, including cardiovascular (hypotension), sexual (impotence), and digestive (nausea, alternating diarrhea and constipation). Many people with diabetes develop neuropathy.

VITAMINS & MINERALS*

More Helpful: vitamin E.

Less Helpful: vitamin B1.

OTHER SUPPLEMENTS*

More Helpful: acetyl-L-carnitine; lipoic acid; omega-6 fatty acid (GLA).

Less Helpful: benfotiamine; carnosine; omega-3 fatty acids (fish oil); quercetin; taurine.

HERBS*

More Helpful: cayenne (topical).

Less Helpful:

COMMENTS

Avoid toxic chemicals and heavy metals. Exercise regularly. Acupuncture treatments may help. A few prescription medications can cause nerve damage. Very high doses of vitamin B6 (usually over 500 mg), especially when not taken with other B-vitamins, can cause reversible peripheral neuropathy.

*See individual listings for dosages and cautions.

Osteoarthritis

(Degenerative Joint Disease)

OVERVIEW

Osteoarthritis (OA) is marked by inflammation and swelling of the bone joints. The joints affected include the neck and spine, hips, knees, and fingers and toes. Symptoms include stiffness and pain. Osteoarthritis is commonly seen in people in their 60s and older. It may be caused, in part, by the years of wear and tear on the joints, resulting in the cartilage deteriorating. Without the protective layer of cartilage, which is smooth and slippery, the bones of the joints rub together, causing the symptoms. Other causes of OA include joint injury and genetics. Also, more women than men get osteoarthritis.

VITAMINS & MINERALS*

More Helpful: vitamin B3 (niacinamide); vitamin C; boron.

Less Helpful: vitamin E; copper; manganese; selenium.

OTHER SUPPLEMENTS*

More Helpful: bromelain; chondroitin sulfate; CMO; glucosamine sulfate; guggulipid; MSM; SAME; SOD.

Less Helpful:

HERBS*

More Helpful: boswellia; cat's claw; cayenne (topical); devil's claw; ginger; stinging nettle; yucca.

Less Helpful:

COMMENTS

Conventional treatment includes cold or heat (pads, bottles, baths), NSAIDs (nonsteroidal anti-inflammatory drugs), corticosteroids, and surgery. Some alternative treatments include relaxation techniques, yoga, and acupuncture. If overweight, you should lose weight. Follow a low-impact (swimming or walking) exercise plan.

*See individual listings for dosages and cautions.

Osteoporosis

OVERVIEW

Osteoporosis is characterized by a generalized, progressive reduction of bone mass. Bones become more porous and are prone to fractures, especially those of the spine, hip, and wrist. Symptoms include back pain, loss of height (also stooped posture or dowager's hump), and bone fractures. Risk factors include being a white female, inadequate calcium intake, sedentary lifestyle, early menopause, eating disorders (anorexia nervosa and bulimia), smoking, excessive alcohol use, genetics (family history), endocrine disorders (diabetes, hyperparathyroidism, hyperthyroidism), and the chronic use of some medications, such as corticosteroids and barbiturates.

VITAMINS & MINERALS*

More Helpful: vitamin C; vitamin D; vitamin K; boron; calcium; magnesium; manganese; silicon; strontium.

Less Helpful: copper; zinc.

OTHER SUPPLEMENTS*

More Helpful: DHEA; essential fatty acids (omega-3 and omega-6); soy isoflavonoids (ipriflavone).

Less Helpful: lysine.

HERBS*

More Helpful: black cohosh; red clover.

Less Helpful:

COMMENTS

Conventional treatments include nutrients (calcium and vitamin D), hormones (raloxifene or estrogen-progesterone combinations for postmenopausal women; calcitonin; parathyroid injections), nonsteroidal anti-inflammatory drugs (NSAIDs) for pain, and biphosphonates to increase bone mass. Other recommendations include weight-bearing and resistance exercises. Also, quit smoking and limit alcohol intake. Fluoride has been used for osteoporosis, and it does increase bone density. However, it seems to reduce bone strength, making it more brittle. Phosphorus is also necessary for bone structure, but the average diet already contains too much of it. Vegetarians are at lower risk for osteoporosis.

*See individual listings for dosages and cautions.

Overweight

(Obesity)

OVERVIEW

Obesity is a medical condition where there is too much body fat, and body weight is 20% more than the ideal, with a Body Mass Index (BMI) 30 or greater. (BMI measures the relationship of weight to height.) More than 30% of the U.S. population is now considered obese. Obesity increases the risk for many health conditions, including cancer (breast, colon, prostate), coronary artery disease, diabetes, gallstones, high blood pressure, osteoarthritis, sleep apnea, and stroke. Factors that contribute to obesity include genetics, inactivity, diet (too much of the wrong foods), metabolism (hypothyroidism), medications (corticosteroids and certain antidepressants), and age.

VITAMINS & MINERALS*

More Helpful: calcium.

Less Helpful: vitamin D; chromium.

OTHER SUPPLEMENTS*

More Helpful: 5-HTP; 7-keto DHEA; conjugated linoleic acid; DHEA; glucomannan; MCT; omega-3 fatty acids (fish oil); pyruvate.

Less Helpful: CoQ10; guar gum; L-carnitine.

HERBS*

More Helpful: green tea.

Less Helpful: banaba; coleus forskohlii; garcinia cambogia.

COMMENTS

Tips for losing weight include: eat less, exercise more; eat more fresh fruit, raw vegetables, and legumes; increase fiber intake; consume more low glycemic index foods; eat slowly and chew many times; don't eat late in the evening; drink plenty of water (no sodas or fruit juices); eat a small handful of unsalted nuts 30 minutes before meals; build up muscles (they increase metabolism); do not multitask while eating; take food out of its container and put a portion on your plate (do not eat out of the container it came in if there is more than one serving); lose weight slowly (2 to 4 pounds per month); do not use food as a reward. Adding whey protein to your diet can help with weight loss.

*See individual listings for dosages and cautions.

Parasites

OVERVIEW

Parasites (internal) are organisms that live in our intestinal tract. They depend on getting the nourishment they need from the food we eat. Internal parasites can range from the microscopic (amoebas, bacteria, fungi) to the visible (assorted worms, small and large). Parasites can cause a variety of symptoms, including those of the GI tract (gas, cramping, pain, diarrhea, nausea, lack of appetite), and also fever, muscle pain, and fatigue. Most parasites come from contaminated food and water.

VITAMINS & MINERALS*

More Helpful:

Less Helpful:

OTHER SUPPLEMENTS*

More Helpful: propolis.

Less Helpful: probiotics.

HERBS*

More Helpful: garlic; goldenseal; oregano.

Less Helpful: ginger; grapefruit seed extract; olive leaf; pau d'arco; skullcap (Chinese).

COMMENTS

Conventional treatment relies on various medications. To avoid becoming infested, observe proper food cleaning and handling (avoid cross-contamination from raw animal products), and cook food (especially animal products) thoroughly. Also, wash hands after handling pets.

*See individual listings for dosages and cautions.

Parkinson's Disease

OVERVIEW

Parkinson's disease (PD) is a slowly progressive, degenerative neurologic disorder that affects muscle control. It is caused by the degeneration of a part of the brain called the substantia nigra. This region of the brain is responsible for the production of the neurotransmitter, dopamine. Reduced dopamine production leads to reduced activation of the nerve cells responsible for normal muscle activity. Symptoms may start with infrequent blinking, lack of facial expression, and deliberateness of speech, then progress to trembling of the arms and legs, muscular rigidity, and poor balance, and finally resulting in the inability to walk or talk, paranoia, delirium, and dementia. The cause of Parkinson's disease is unknown, but possible factors include genetics, exposure to environmental poisons (pesticides and insecticides, carbon monoxide, carbon disulfide, manganese), viral infection, head trauma, free radicals, and some medications.

VITAMINS & MINERALS*

More Helpful: vitamin E.

Less Helpful: choline (CDP or GPC); vitamin C; vitamin D.

OTHER SUPPLEMENTS*

More Helpful: CoQ10; creatine; octacosanol; phenylalanine.

Less Helpful: tyrosine.

HERBS*

More Helpful: green tea.

Less Helpful:

COMMENTS

Treatment includes medications (L-dopa or levodopa, dopamine agonists, anticholinergics, antidepressants), physical therapy, and surgery. Drinking caffeinated beverages (coffee, cola, tea) reduces the risk for PD. Exercise regularly, such as walking. It is very important to stretch the muscles, making yoga very helpful.

*See individual listings for dosages and cautions.

Poor Circulation

(Intermittent Claudication)

OVERVIEW

Poor blood circulation is usually caused by atherosclerosis (hardening of the arteries), resulting in restricted blood supply to the muscles of the legs. Symptoms include muscle cramps, aches, and fatigue. Symptoms are usually brought on by physical exercise, and disappear a few minutes after resting from the activity. Risk factors for poor circulation include obesity, diabetes, smoking, and a sedentary lifestyle.

VITAMINS & MINERALS*

More Helpful: vitamin B3 (inositol hexanicotinate); vitamin E.

Less Helpful: vitamin C; magnesium.

OTHER SUPPLEMENTS*

More Helpful: arginine; policosanol; propionyl-L-carnitine.

Less Helpful:

HERBS*

More Helpful: butcher's broom; ginkgo; gotu kola.

Less Helpful:

COMMENTS

Besides reducing the risk factors listed above, treatment includes yoga, acupuncture, and massage. If you have a "desk job," every hour get up and walk and stretch for a few minutes.

*See individual listings for dosages and cautions.

Premenstrual Syndrome

(PMS)

OVERVIEW

Premenstrual syndrome is a condition many women experience before menstruation. The actual cause is unknown. Nevertheless, factors contributing to it may include hormonal or neurotransmitter imbalances, stress, poor diet, excessive alcohol, caffeine, and salt intake, and a sedentary lifestyle. Symptoms include fatigue, bloating, breast tenderness, headaches, mood swings, food cravings, acne, and gastrointestinal problems (nausea, constipation, diarrhea).

VITAMINS & MINERALS*

More Helpful: vitamin B6; vitamin E; calcium; magnesium; manganese.

Less Helpful:

OTHER SUPPLEMENTS*

More Helpful: omega-6 fatty acid (GLA); theanine; tryptophan.

Less Helpful:

HERBS*

More Helpful: butcher's broom; chasteberry; dong quai; ginkgo; St. John's wort.

Less Helpful:

COMMENTS

Conventional treatments include diuretics (to reduce fluid retention) and oral contraceptives (to balance hormones). Other treatments that may help include dietary changes (reduce alcohol, caffeine, and salt) and lifestyle changes (aerobic exercise, yoga, and meditation).

*See individual listings for dosages and cautions.

Prostate Problems

(Benign Prostatic Hyperplasia)

OVERVIEW

Prostate problems affect most men, usually over the age of 50. The most common is prostate enlargement, usually called benign prostatic hyperplasia (BPH). The prostate is a walnut-sized gland, with the urethra passing through it. As the prostate enlarges, it restricts urinary flow. Symptoms include difficulties in urination, including nighttime urination (nocturia), weak stream, difficulty starting the stream, dribbling, and the inability to completely empty the bladder. There is also an increased risk for urinary tract infections (UTIs).

VITAMINS & MINERALS*

More Helpful: zinc.

Less Helpful:

OTHER SUPPLEMENTS*

More Helpful: beta-sitosterol.

Less Helpful: flaxseed oil.

HERBS*

More Helpful: pygeum; rye grass pollen extract; saw palmetto.

Less Helpful: garlic; prickly pear cactus; pumpkin seed oil; red clover; stinging nettle.

COMMENTS

Conventional treatment includes medications to improve urine flow by relaxing the muscles around the prostate gland. Other medications can help to reduce the size of the prostate. However, some medications may cause erectile dysfunction or a decrease in libido. Surgery is also done to cut away excess prostate tissue. Recommendations include reducing alcohol intake, especially beer. There is an old amino acid formula (alanine, glycine, glutamic acid) that may help. Some yoga positions and regular exercise can help, but avoid bicycling, which may put excessive pressure on the prostate.

*See individual listings for dosages and cautions.

Psoriasis

OVERVIEW

Psoriasis is a skin condition caused by the rapid production of the skin cells, resulting in pink, raised patches of skin with white scales. Areas of the body commonly affected include the elbows, knees, and scalp, but psoriasis can appear on almost any part of the body. The cause is unknown, but genetics seems to play a role. Other factors contributing to psoriasis include emotional stress, infection, smoking, and an immune response to a disease. Light-skinned people are more at risk. Also, the joints can be affected, causing psoriatic arthritis.

VITAMINS & MINERALS*

More Helpful:

Less Helpful: vitamin A; vitamin D (oral and topical).

OTHER SUPPLEMENTS*

More Helpful: omega-3 fatty acids (fish oil).

Less Helpful:

HERBS*

More Helpful: aloe vera (topical); cayenne (topical); gotu kola (topical); milk thistle.

Less Helpful: chamomile (topical); licorice (topical).

COMMENTS

Conventional treatments include hydrocortisone ointments (corticosteroids), oral medications, and sunlight therapy. Bovine (cow) and shark cartilage may be helpful. Use natural moisturizers, especially ones containing significant amounts of aloe vera, plus chamomile and vitamins A and D. Try various stress reduction techniques.

*See individual listings for dosages and cautions.

Raynaud's Disease & Phenomenon

OVERVIEW

Raynaud's Disease and Phenomenon are disorders of the small arteries of the extremities, primarily of the fingers, but sometimes also the toes. They occur much more often in women than men. Spasms of the arteries cause the hands (and sometimes the feet) to become cold and numb, sometimes accompanied by a pins and needles sensation. With Raynaud's disease, the cause is unknown, whereas with Raynaud's phenomenon, the cause is secondary to another condition, such as lupus, rheumatoid arthritis, or scleroderma. Symptoms can be triggered by cold, smoking, certain medications (for high blood pressure or migraines), and working with machines that vibrate (e.g., jackhammers). Symptoms may last for few minutes to several hours.

VITAMINS & MINERALS*

More Helpful: vitamin B3 (inositol hexanicotinate).

Less Helpful: magnesium.

OTHER SUPPLEMENTS*

More Helpful: omega-3 fatty acids (fish oil).

Less Helpful: omega-6 fatty acid (GLA).

HERBS*

More Helpful: ginkgo.

Less Helpful:

COMMENTS

Conventional treatment ranges from certain medications to surgery. Other recommendations include avoiding exposure to cold, giving up cigarettes and caffeine-containing products, and stress reduction. Finally, some over-the-counter medications, including decongestants, diet pills, and cold remedies, can trigger symptoms.

*See individual listings for dosages and cautions.

Retinopathy

OVERVIEW

Retinopathy is an eye disorder of the small blood vessels (capillaries) of the retina. The two main causes are diabetes and hypertension (high blood pressure). With diabetic retinopathy, there are two kinds (nonproliferative and proliferative). Nonproliferative retinopathy is characterized by leaky capillaries, whereas proliferative retinopathy has increased capillary formation. Hypertensive retinopathy develops from a thickening of the small arteries (arterioles), decreasing their response to light. As the disease progresses, the arterioles can also become leaky, further affecting vision. Symptoms of retinopathy include blurred and fluctuating vision, difficulty adjusting from bright to dim light, poor night vision, and floating specks in the eye. If left untreated, retinopathy can lead to blindness.

VITAMINS & MINERALS*

More Helpful: vitamin E.

Less Helpful:

OTHER SUPPLEMENTS*

More Helpful:

Less Helpful: quercetin.

HERBS*

More Helpful: bilberry; ginkgo; grape seeds (OPCs), pine bark (pycnogenols).

Less Helpful:

COMMENTS

Treatment includes more closely regulating blood sugar levels (if diabetic) or reducing blood pressure (if hypertensive). Laser treatment (photocoagulation) and surgery (vitrectomy) are also available. If you are a smoker, quit.

*See individual listings for dosages and cautions.

Rheumatoid Arthritis

OVERVIEW

Rheumatoid arthritis (RA) is an autoimmune disease affecting the joints. The immune system attacks the synovial membranes lining the joints, causing inflammation and increased release of synovial fluid. The synovial membrane becomes thickened and the joint swells, damaging the joint and restricting movement. Joints affected include those of the arms (hands, wrists, elbows, shoulders) and the legs (ankles, feet, knees). Rheumatoid arthritis usually appears between the ages 20 and 40, and more women than men are affected. Initial symptoms are general and include fatigue and poor appetite. As the disease progresses, there is pain and swelling, joint redness and warmth, and morning stiffness. Symptoms are usually experienced on both sides of the body (bilateral). Another form of the disease affects children (juvenile rheumatoid arthritis).

VITAMINS & MINERALS*

More Helpful: vitamin E.

Less Helpful: vitamin B5; copper; selenium; zinc.

OTHER SUPPLEMENTS*

More Helpful: cetyl myristoleate; essential fatty acids (omega-3 and omega-6).

Less Helpful: bromelain; SOD.

HERBS*

More Helpful: cat's claw; cayenne (topical); ginger; turmeric.

Less Helpful: boswellia.

COMMENTS

Conventional treatment includes medications to reduce inflammation and slow the progression of the disease. Other therapies include hot or cold packs, gentle exercise (especially in water), and yoga. Food allergies may contribute to RA, so keep a food diary to determine if any food is causing flare-ups.

*See individual listings for dosages and cautions.

Scleroderma

OVERVIEW

Scleroderma is an autoimmune disease that causes the overproduction of collagen, a connective tissue. The result is abnormal deposits of scar tissue, mostly in the face and hands (limited scleroderma). Diffuse scleroderma occurs when it spreads to the internal organs, such as the lungs, heart, kidneys, and digestive tract. Symptoms include changes in skin color, swollen hands and feet, skin thickening and tightening, problems involving the affected organs (if diffuse type), fatigue, and numb hands and feet (Raynaud's disease). The people most likely to get scleroderma are middle-aged women. Diffuse scleroderma is more serious than the limited version, because of the internal organs being affected.

VITAMINS & MINERALS*

More Helpful: PABA (Potaba).

Less Helpful:

OTHER SUPPLEMENTS*

More Helpful:

Less Helpful: MSM; omega-6 fatty acid (GLA).

HERBS*

More Helpful:

Less Helpful: gotu kola.

COMMENTS

Some medications are available that help to slow the disease's progression, as well as treating the symptoms created by the damaged internal organs. If a smoker, quit. Avoid toxic chemicals, such as paint thinners and other organic solvents. Exercise and stretching are helpful.

*See individual listings for dosages and cautions.

Shingles

(Herpes Zoster)

OVERVIEW

Shingles is caused by the same virus (varicella-zoster) that causes chicken pox. The virus usually lays dormant in the dorsal root ganglia nerve cells (neurons) of the spinal cord. The virus can be reactivated by emotional stress, physical trauma, or a serious illness. Initial symptoms can be fatigue, fever, or muscle soreness. The outbreak proceeds with pain, burning, and itching, followed by blisters and a rash. The area affected usually ranges from the upper spine around to one side of the chest, but the face, arms, and legs can also be involved. The whole outbreak may last for several weeks. Shingles is contagious for anyone who never had chicken pox. Pregnant women and people with compromised immune systems should also avoid anyone who is infected.

VITAMINS & MINERALS*

More Helpful:

Less Helpful: vitamin B12 (injection); vitamin C; vitamin E (oral and topical).

OTHER SUPPLEMENTS*

More Helpful: propolis (topical).

Less Helpful: lysine; MSM (topical).

HERBS*

More Helpful: cayenne (topical).

Less Helpful: aloe vera (topical); licorice (topical).

COMMENTS

Conventional treatment includes antiviral, pain relieving, and anti-inflammatory medications. There are also topical preparations to reduce the pain and itching. Natural ones include cayenne (capsaicin cream), which reduces pain (do not apply to open sores). Other creams or gels may include combinations of aloe vera and vitamin E, which will help with the pain and itching, and also accelerate the healing process. Colloidal oatmeal added to bath water can help to reduce the itching. Also, using cold, wet compresses can soothe the affected area.

*See individual listings for dosages and cautions.

Sinusitis

OVERVIEW

Sinusitis is an infection or inflammation of the sinuses (hollow spaces in the bones around the nose and eyes). Sometimes the sinuses cannot drain because the openings (ostia) become blocked. The blockage may be caused by an upper respiratory infection (e.g., common cold), dental infection, allergies, or atmospheric pressure changes (air travel or underwater swimming). Nasal polyps also increase the chance of getting sinusitis. The accumulated mucus allows for the growth of bacteria, viruses, or fungi. Pressure builds up, causing pain around the eyes and cheeks, and also headache, fever, and breathing difficulties.

VITAMINS & MINERALS*

More Helpful:

Less Helpful: vitamin A; vitamin C.

OTHER SUPPLEMENTS*

More Helpful: bromelain; serrapeptase.

Less Helpful: bioflavonoids.

HERBS*

More Helpful:

Less Helpful: echinacea; eucalyptus (vapor); garlic.

COMMENTS

Conventional treatment includes medications, such as antibiotics, decongestants, and corticosteroids (to reduce inflammation). Other treatments include irrigation of the sinuses with saline or other solutions (colloidal silver, grapefruit seed extract, xylitol). Steam vaporizers and warm compresses offer relief. Drink plenty of water. It also helps to avoid smoke, other pollutants, and allergens.

*See individual listings for dosages and cautions.

Stroke

(Cerebrovascular Accident; CVA)

OVERVIEW

Strokes are caused when there is a decrease in the brain's blood flow. One cause is a blood clot (embolus), which blocks blood flow (ischemic stroke). Sometimes a person will experience a ministroke (transient ischemic attack; TIA), with stroke-like symptoms lasting less than a day. About four out of five strokes are of the ischemic type. Another cause of strokes is a rupture of a blood vessel in the brain, causing pressure on the surrounding blood vessels, reducing blood flow (hemorrhagic stroke). Atherosclerosis and hypertension are primary contributors to ischemic and hemorrhagic strokes, respectively. When there is an interrupted blood flow in an area of the brain, that part is starved of oxygen, resulting in tissue death. Symptoms can include paralysis, weakness, speech and comprehension difficulties, and if not treated quickly enough, death. Prompt medical attention is critical.

VITAMINS & MINERALS*

More Helpful: choline (CDP and GPC); calcium; potassium.

Less Helpful: vitamin E; magnesium.

OTHER SUPPLEMENTS*

More Helpful: glycine (sublingual); omega-3 fatty acids (fish oil).

Less Helpful: acetyl-L-carnitine; vinpocetine.

HERBS*

More Helpful:

Less Helpful: ginkgo; ginseng (Siberian); green tea.

COMMENTS

These nutraceuticals may be helpful for prevention, treatment, or dealing with the aftereffects of an ischemic stroke. People at risk for a hemorrhagic stroke should avoid nutraceuticals that thin the blood, such as fish oil, garlic, ginkgo, vitamin E, and many others. Ischemic strokes are treated with blood thinners and clot busters. Hemorrhagic strokes are treated by lowering blood pressure and using medications to reduce brain swelling. Lessen the chance of getting a stroke by making lifestyle changes, such as lowering blood pressure, stopping smoking, reducing high cholesterol, dietary improvements, stress reduction, and appropriate exercise.

*See individual listings for dosages and cautions.

Tinnitus

OVERVIEW

Tinnitus is a persistent sound (ringing, buzzing, roaring) that is internal to the ear and is only sensed by the person hearing it. It may be continuous, intermittent, or pulsate, and may be accompanied by hearing loss. Tinnitus can be caused by almost any problem concerning the ear (e.g., Meniere's disease), as well as ear wax, ear infection, TMJ, high blood pressure, atherosclerosis, tumors, head trauma, certain medications (aspirin, antibiotics, diuretics, quinine), allergies, hypothyroidism, caffeine, and prolonged exposure to loud noises.

VITAMINS & MINERALS*

More Helpful:

Less Helpful: vitamin B12; zinc.

OTHER SUPPLEMENTS*

More Helpful:

Less Helpful: melatonin; vinpocetine.

HERBS*

More Helpful:

Less Helpful: ginkgo.

COMMENTS

If the cause of tinnitus cannot be determined and eliminated, assorted stress reduction techniques may offer help. Reduce intakes of alcohol, caffeine, nicotine, and salt. Limit the use of aspirin. Avoid loud noises and music. Some acupressure, acupuncture, and yoga techniques may be helpful. If tinnitus affects your sleep, try using a white noise or ambient sound generator.

*See individual listings for dosages and cautions.

Ulcers, Peptic

OVERVIEW

Peptic ulcers are sores in the protective mucous linings of the upper GI tract. Peptic ulcers develop in three regions, most often in the duodenum (the beginning part of the small intestine), then the stomach, and occasionally, the esophagus. Ulcers are caused by a variety of agents, including bacterial infections (*Helicobacter pylori*), chronic use of some drugs (aspirin and other NSAIDs, such as ibuprofen and naproxen), and regular intake of alcohol, caffeine, and cigarettes. Ulcers also tend to run in the family, either because of genetics or inherited lifestyle. Symptoms of peptic ulcers include burning and bloating sensations in the upper abdominal area, sometimes accompanied by nausea and vomiting. Duodenal ulcers produce symptoms several hours after the meal, and symptoms are often relieved by eating. With gastric ulcers, symptoms appear shortly after eating. Other evidence of peptic ulcers is black, tarry, or bloody stools.

VITAMINS & MINERALS*

More Helpful: zinc.

Less Helpful: vitamin A; vitamin C.

OTHER SUPPLEMENTS*

More Helpful: mastic gum.

Less Helpful: citrus bioflavonoids; glutamine; quercetin.

HERBS*

More Helpful: cayenne; licorice (DGL).

Less Helpful: aloe vera; bacopa; bilberry; garlic; gotu kola.

COMMENTS

Conventional treatment includes antacids, antibiotics, histamine H2 blockers, and proton pump inhibitors. Avoid alcohol, caffeinated sodas, and coffee. Do not smoke. Eat unripe bananas or plantain. Drink raw cabbage juice (contains glutamine). Increase intake of high fiber foods, and decrease intake of fatty foods. Eat smaller meals. Try various stress reduction techniques.

*See individual listings for dosages and cautions.

Underactive Thyroid

(Hypothyroidism)

OVERVIEW

Hypothyroidism is caused by decreased activity of the thyroid gland resulting in underproduction of thyroid hormones. In the past, before iodine was added to salt, iodine deficiency was a primary cause of hypothyroidism and goiter (enlarged thyroid gland). Now, many cases of hypothyroidism are attributed to an autoimmune disease. Another cause is destruction or removal of the thyroid because of cancer or an overactive thyroid (hyperthyroidism). When production of thyroid hormones is inadequate, there is a reduction of metabolic activity. Symptoms of hypothyroidism include fatigue, weight gain, sensitivity to cold, low blood pressure, dry skin and hair, constipation, elevated blood cholesterol, menstrual problems, depression, and memory problems. Hypothyroidism is more common in women.

VITAMINS & MINERALS*

More Helpful: iodine.

Less Helpful:

OTHER SUPPLEMENTS*

More Helpful: tyrosine.

Less Helpful:

HERBS*

More Helpful: kelp (source of iodine).

Less Helpful: coleus forskohlii.

COMMENTS

Treatment often involves hormone replacement with either natural or synthetic thyroid hormone. Avoid raw cruciferous vegetables (broccoli, brussels sprouts, cauliflower, cabbage, collard greens, kale), which contain goitrogens (suppress thyroid function). There is some concern that soy products may affect people with thyroid problems, especially underactive thyroid.

*See individual listings for dosages and cautions.

Urinary Tract Infections

(Cystitis; Pyelonephritis; Urethritis)

OVERVIEW

Urinary tract infections (UTIs) mostly affect the bladder (cystitis) and the urethra (urethritis), but sometimes also the kidneys (pyelonephritis). Usually the infection is caused by the bacterium, *Escherichia coli* (*E. coli*), which is normally found in the GI tract. UTIs are more common in women than men, primarily because the urethral opening is close to the anus (source of *E. coli* and other bacteria) and the vagina (may contain sexually transmitted diseases). Symptoms include frequent, urgent, and painful (burning) urination, cloudy and foul-smelling urine, and blood in the urine. If the kidneys become infected, there can also be symptoms of chills and fever, and pain in the side.

VITAMINS & MINERALS*

More Helpful:

Less Helpful: vitamin C.

OTHER SUPPLEMENTS*

More Helpful: D-mannose.

Less Helpful: probiotics (oral and vaginally).

HERBS*

More Helpful: cranberry; dandelion; uva ursi.

Less Helpful: goldenseal; stinging nettle.

COMMENTS

Conventional treatment includes the use of antibiotics. The folk remedy of drinking cranberry juice has been scientifically proven as being both an effective treatment and preventative. Components in the juice make it harder for *E. coli* to adhere to the lining of the urinary tract. Drinking more water, and urinating directly after sexual intercourse, can also reduce the frequency of UTIs.

*See individual listings for dosages and cautions.

Varicose Veins

(Varicosities)

OVERVIEW

Varicose veins are enlarged veins caused by poorly functioning valves within the vein, allowing for blood to pool or backflow. They usually have a dark, purplish-blue color, bulge, are often twisted, and usually appear on the lower leg and ankle. Hemorrhoids are another form of varicose veins, and spider veins are just small versions. Varicose veins can be caused by inherent weaknesses in the vein walls (family history), pregnancy, obesity, and standing for prolonged periods of time. Chronic constipation can lead to hemorrhoids. Women are more likely to develop varicosities than men. Varicose veins may cause the legs to ache (deep veins) or develop ulcers. Deep varicose veins can also develop blood clots, which can have serious consequences.

VITAMINS & MINERALS*

More Helpful:

Less Helpful: vitamin C.

OTHER SUPPLEMENTS*

More Helpful:

Less Helpful: citrus bioflavonoids.

HERBS*

More Helpful: gotu kola.

Less Helpful: bilberry; butcher's broom; grape seeds; horse chestnut.

COMMENTS

Various surgical procedures are available for treating varicosities. Other treatments include avoiding standing for long periods of time, elevating the legs, and regular exercise (low impact). Try stretching exercises or yoga. If overweight, lose weight. Do not smoke cigarettes.

*See individual listings for dosages and cautions.

Vertigo

(Dizziness)

OVERVIEW

Vertigo is an extreme form of dizziness. Dizziness is defined as the inability to keep normal balance, and may be connected to nausea, mental confusion, or weakness. With vertigo, there is an accompanying sensation of spinning or rotation. Vertigo may be caused by a disturbance (inflammation or infection) of the balance organs located in the inner ear (semicircular canals and vestibular nuclei). Several conditions involving vertigo are Meniere's disease, labyrinthitis, and benign paroxysmal positional vertigo. The first two conditions are treated with medications, and the latter condition can be treated in a medial office using the canalith repositioning procedure.

VITAMINS & MINERALS*

More Helpful:

Less Helpful:

OTHER SUPPLEMENTS*

More Helpful: vinpocetine.

Less Helpful:

HERBS*

More Helpful: ginger; ginkgo.

Less Helpful:

COMMENTS

Avoid sudden changes in posture. If sitting, get up slowly. Do not turn your head quickly. If you smoke, stop. Try aromatherapy, such as lavender.

*See individual listings for dosages and cautions.

Yeast Infection

(Candidiasis)

OVERVIEW

Yeast infections are caused by an overgrowth of various yeast species, including *candida albicans*. The yeast grows in moist environments, including the mouth (thrush), intestines (systemic yeast infection), buttocks (diaper rash), and the vagina (vaginitis). Symptoms of thrush include raised white patches in the mouth and throat. Vaginal yeast infections produce a thick, white discharge, along with vulvar itching, redness, and swelling. Systemic yeast infection may produce an array of nonspecific symptoms, including fatigue, allergies, depression, and digestive problems. Yeast overgrowth is associated with excessive use of certain antibiotics, and lowered immune states.

VITAMINS & MINERALS*

More Helpful:

Less Helpful:

OTHER SUPPLEMENTS*

More Helpful: prebiotics; probiotics.

Less Helpful: caprylic acid.

HERBS*

More Helpful: goldenseal.

Less Helpful: cinnamon; echinacea; grapefruit seed extract; oregano oil; tea tree oil (topical).

COMMENTS

Conventional treatment involves the use of various antifungal drugs. For vaginitis, cotton underwear, without panty hose, is recommended, along with using cultured products (orally and vaginally). For systemic candidiasis, many dietary changes are advised, especially reducing carbohydrate intake.

*See individual listings for dosages and cautions.

Nutraceuticals Section

PLEASE NOTE

The next 223 pages contain scientific and medical information about a variety of vitamins, minerals, herbs, and other kinds of supplements.

If you have a major health condition, or are taking medications, please consult with a qualified health professional before trying any of these supplements.

5-Hydroxytryptophan

(5-HTP)

DESCRIPTION/FUNCTION

5-HTP is the first step in the conversion of the amino acid, L-tryptophan, to serotonin, an inhibitory neurotransmitter. Further conversion leads to melatonin.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Griffonia seeds (*Griffonia simplicifolia*).

MAINTENANCE/THERAPEUTIC RANGE

25 mg to 300 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Anxiety; depression; fibromyalgia; insomnia; migraine; obesity; tension headache.

COMMENTS

Purchase from a reputable supplier to avoid possible Peak X contamination, which could lead to eosinophilia-myalgia syndrome. More effective if taken with vitamin B6.

CAUTIONS

Avoid if pregnant. Consult with your health practitioner if you are using SSRIs (Selective Serotonin Reuptake Inhibitors), tricyclic antidepressants, or MAOIs (monoamine oxidase inhibitors).

7-Keto Dehydroepiandrosterone

(7-Keto DHEA)

DESCRIPTION/FUNCTION

DHEA is the major steroid produced by the adrenal gland. 7-Keto DHEA is a metabolite of DHEA. While DHEA can be converted to testosterone and estrogens, 7-keto DHEA does not.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Nutritional supplements.

MAINTENANCE/THERAPEUTIC RANGE

5 mg to 100 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Immune function; obesity (increased thermogenesis).

COMMENTS

Limited research. Used instead of DHEA when it is desired to avoid increased sex hormone production.

CAUTIONS

Avoid if pregnant.

Acetyl-L-Carnitine

(ALC; ALCAR)

DESCRIPTION/FUNCTION

Acetyl-L-Carnitine is a form of L-carnitine that has similar properties, and a few additional ones.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Nutritional supplements.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 5,000 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Angina pectoris; congestive heart failure; depression; high triglycerides; HIV/AIDS; infertility (male); memory loss; neuropathy; stroke.

COMMENTS

ALC is helpful with memory loss because it increases acetylcholine levels, a neurotransmitter important in memory function. As with amino acids, acetyl-L-carnitine should be taken on an empty stomach, or at least separate from protein foods.

CAUTIONS

Consult with your health practitioner if you have seizures.

AHCC

(Active Hexose Correlated Compound)

DESCRIPTION/FUNCTION

AHCC is a monosaccharide produced from the mycelium of the shiitake mushroom that is grown in rice bran extract. It contains both alpha- and beta-glucans, but primarily alpha-1,4 glucan.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Shiitake mushroom extract.

MAINTENANCE/THERAPEUTIC RANGE

1 g to 6 g.

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer; HIV/AIDS; immune function; liver support.

COMMENTS

AHCC increases the activity of natural killer (NK) cells, the number of T cells, and has other immune system benefits.

CAUTIONS

Avoid if pregnant.

Aloe

(Aloe vera; Aloe barbadensis)

DESCRIPTION/FUNCTION

Aloe is a fleshy-leaved plant native to Asia, Africa, and the Middle East. The medicinal part is the juice found in the leaves. Active components include anthracene derivatives (including aloin and aloe-emodin), 2-alkylchromones (aloe resins), and flavonoids.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Freshly cut leaves.

MAINTENANCE/THERAPEUTIC RANGE

Follow directions on container.

POSSIBLE THERAPEUTIC APPLICATIONS

Burns; constipation; herpes (genital); psoriasis (topical); ulcerative colitis; ulcers (skin).

COMMENTS

Aloe is used two ways. Topically, the gel is used for burns and skin problems (psoriasis, herpes, ulcers). The other use is internal, primarily for constipation. For constipation, aloe latex is used, which is derived from cells closer to the inner skin of the leaf.

CAUTIONS

Some aloe products meant for internal use are more irritating and laxative than others. These should be used sparingly. They might interfere with some diuretics (increased potassium loss), and also cause excessive GI irritation. Diabetics: aloe may also lower blood sugar levels.

Alpha-Lipoic Acid

(Lipoic Acid; R-Lipoic Acid; Thioctic Acid)

DESCRIPTION/FUNCTION

Lipoic acid is a unique antioxidant, being both water- and fat-soluble. It is part of two multi-enzyme complexes: PDH (pyruvate dehydrogenase) and alpha-ketoglutarate dehydrogenase. These enzymes are part of the Krebs cycle (actually, PDH connects glycolysis with the Krebs cycle), and are thus essential in the conversion of food into energy.

DRI (RDA or AI for Adults)

None.

MAJOR SOURCES

Made in the body and nutritional supplements.

MAINTENANCE/THERAPEUTIC RANGE

25 mg to 1,000 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Coronary heart disease; diabetes (insulin sensitivity and neuropathy); liver support; memory loss.

COMMENTS

Lipoic acid has a sparing action on other antioxidants, including vitamins C and E, CoQ10, and glutathione. Like milk thistle (silymarin), lipoic acid has liver-protective properties. An older name for lipoic acid is thioctic acid. (R)-Lipoic acid is considered to be a more biologically active form.

CAUTIONS

Diabetics may need to adjust antidiabetic medication.

Andrographis

(Andrographis paniculata)

DESCRIPTION/FUNCTION

Andrographis is an herb found in Asia, and especially, India. It is used in Ayurvedic medicine and traditional Chinese medicine. Active ingredients include diterpenes (andrographolide, deoxyandrographolide, andrographiside, neoandrographolide).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Leaves and flowers.

MAINTENANCE/THERAPEUTIC RANGE

200 mg to 1,000 mg (standardized to 5% andrographolide).

POSSIBLE THERAPEUTIC APPLICATIONS

Common cold; flu; immune function; liver support.

COMMENTS

High doses of andrographis may be helpful for people with HIV. Preliminary research shows that it may also offer some heart protective effects (lowers blood pressure, thins the blood, antioxidant properties).

CAUTIONS

Avoid if pregnant, since andrographis may have abortifacient activity. It may also reduce fertility in men and women. Do not take if you are on blood thinning drugs or immunosuppressant medication.

Arginine

(L-Arginine)

DESCRIPTION/FUNCTION

Arginine is classified as a conditionally essential, basic amino acid. It is part of the urea cycle, and is instrumental in eliminating ammonia, a toxic waste product of protein metabolism. It is also involved in protein synthesis.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

All animal protein sources: dairy, fish, meat, poultry. Also nuts and chocolate.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 20,000 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Angina pectoris; congestive heart failure; coronary heart disease; erectile dysfunction; interstitial cystitis; headache (migraine); high blood pressure; high cholesterol; immune function; infertility (male); poor circulation; wound healing.

COMMENTS

Arginine is helpful for erectile dysfunction because it aids in the production of nitric oxide (NO), a molecule necessary for dilating the blood vessels in the penis. Nitric oxide also has neurotransmitter properties. Taken in large quantities at night, arginine stimulates the pituitary in releasing growth hormone. As with all amino acids, supplements should be taken on an empty stomach, or at least separate from protein foods.

CAUTIONS

Consult with your health practitioner if you have liver or kidney failure. May also be a problem for people who have herpes, since the virus uses arginine for replication.

Arjuna

(Terminalia arjuna)

DESCRIPTION/FUNCTION

Arjuna is a relatively large tree native to India. It has been used in Ayurvedic medicine for several thousand years. Active ingredients include flavonoids (arjunolon, baicalein, luteolin), steroids (beta-sitosterol), tannins (gallotannins, ellagitannins), triterpenes (arjunolic acid, oleanolic acid).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Tree bark.

MAINTENANCE/THERAPEUTIC RANGE

1,000 to 2,000 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Angina; congestive heart failure; high blood pressure.

COMMENTS

Using arjuna for short periods of time shows benefits, but modern research on its long term use hasn't been done.

CAUTIONS

To be on the safe side, do not take if pregnant. Arjuna may potentiate the activity of barbiturates.

Artichoke, Globe

(Cynara scolymus)

DESCRIPTION/FUNCTION

This artichoke is native to the Mediterranean. The scales and hearts are eaten as a vegetable. The leaves contain active compounds, including caffeic acid derivatives (chlorogenic acid, cynarin), flavonoids (rutin), and sesquiterpene lactones.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Leaves.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 2,000 mg (standardized to 15% chlorogenic acid and 2% to 5% cynarin).

POSSIBLE THERAPEUTIC APPLICATIONS

High cholesterol; high triglycerides; irritable bowel syndrome; liver support; nausea (biliary disease).

COMMENTS

The cynarin has a protective effect on the liver, similar to the silymarin found in milk thistle.

CAUTIONS

Consult with your health practitioner if you have gallstones, since cynarin stimulates bile flow.

Artichoke, Jerusalem

(Helianthus tuberosus)

DESCRIPTION/FUNCTION

This artichoke is native to North America and is related to the sunflower. The potato-like tubers found underground are eaten as a vegetable. The tubers contain inulin, which is a fructosan glycan polysaccharide comprised of linked units (polymers) of fructose.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Tubers.

MAINTENANCE/THERAPEUTIC RANGE

Unknown, but probably several ounces. Chicory is a better source of inulin.

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer (colorectal); constipation; diabetes; high triglycerides.

COMMENTS

The inulin content of the tubers supports the growth of bifidobacteria found in the colon. Also, inulin may increase the absorption of calcium and magnesium in the colon.

CAUTIONS

None known.

Ascorbyl Palmitate

DESCRIPTION/FUNCTION

Ascorbyl palmitate is a fat-soluble form of vitamin C. Ascorbic acid (ascorbate) is the water-soluble form.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Nutritional supplements.

MAINTENANCE/THERAPEUTIC RANGE

Unknown.

POSSIBLE THERAPEUTIC APPLICATIONS

Unknown.

COMMENTS

Ascorbyl palmitate is sometimes used as an antioxidant preservative in food, nutritional supplements, and skin care products. It has found its way into creams and lotions for topical application to the skin, but some research indicates that it may be harmful when the skin is exposed to the sun and UVB rays. There is little research on its benefits when used internally.

CAUTIONS

When applied topically, it may not be good for sun-exposed skin.

Ashwaganda

(Withania somnifera)

DESCRIPTION/FUNCTION

Found primarily in India and northern Africa, ashwaganda is often called Indian ginseng. It has been used traditionally in Indian and Ayurvedic medicine. Active ingredients include alkaloids, saponins, and steroidal lactones (withanolides).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Roots and leaves.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 1,500 mg (standardized to contain 1% alkaloids and 1.5% withanolides).

POSSIBLE THERAPEUTIC APPLICATIONS

Immune function; stress.

COMMENTS

Ashwaganda may reduce anxiety (anxiolytic) by having actions similar to GABA. It may also have anticonvulsant properties.

CAUTIONS

Avoid if pregnant. Consult with your health practitioner if you have hyperthyroidism, or are taking medication for mood disorders or to suppress immune function.

Astaxanthin

DESCRIPTION/FUNCTION

Astaxanthin is a member of the carotenoid family, and is structurally similar to beta-carotene, lutein, and zeaxanthin. However, unlike beta-carotene, it cannot be converted to vitamin A. Astaxanthin is a reddish pigment found in shrimp, lobster, krill, *Haematococcus pluvialis* algae, and some birds (e.g., flamingoes). It is added to the fish feed of farmed salmon to give them the reddish color found in wild salmon.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Salmon, lobster, rainbow trout.

MAINTENANCE/THERAPEUTIC RANGE

2 mg to 5 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer.

COMMENTS

Astaxanthin exhibits strong antioxidant activity, thus it may have benefit in heart disease. It is speculated that it has anticancer properties, based on animal studies. Research on humans is lacking.

CAUTIONS

None known.

Astragalus

(Astragalus membranaceus)

DESCRIPTION/FUNCTION

Astragalus is native to China, and is commonly used in Chinese medicine. Active compounds include fatty acids, isoflavonoids, polysaccharides (astragalin), saponins (astragalosides), sterols, and triterpene glycosides (brachyosides, cyclocephaloside, astrachryoside).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Mostly the roots are used medicinally.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 2,000 mg (standardized to 70% polysaccharides).

POSSIBLE THERAPEUTIC APPLICATIONS

Angina pectoris; cancer (breast, lung); common cold; congestive heart failure; liver support (hepatitis); immune function; infertility (male); memory loss.

COMMENTS

Besides its other attributes, astragalus has antioxidant properties. In Traditional Chinese Medicine (TCM), astragalus is usually combined with other herbs. It is also used in soup.

CAUTIONS

Consult with your health practitioner if you are planning on surgery, are taking blood thinning drugs, or have an autoimmune disorder.

Bacopa

(Bacopa monniera)

DESCRIPTION/FUNCTION

Bacopa is found in India. Used in Ayurvedic medicine, Bacopa is known as Brahmi. Active components include alkaloids (brahmine), lipids (bacoside, bacosaponin), phytosterols (beta-sitosterol).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Leaves.

MAINTENANCE/THERAPEUTIC RANGE

100 mg to 400 mg (standardized to 20% bacosides).

POSSIBLE THERAPEUTIC APPLICATIONS

Anxiety; memory loss; ulcers.

COMMENTS

Bacopa seems to affect neurotransmitters, including acetylcholine, GABA, and serotonin. It also has antioxidant properties.

CAUTIONS

None known.

Banaba

(Lagerstroemia speciosa)

DESCRIPTION/FUNCTION

Banaba is related to crepe myrtle. It is found in Southeast Asia, and has been traditionally used in the Philippines. Active ingredients include corosolic acid, valoneic acid, and ellagitannins (flosin B, lagerstroemin, reginin A).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Leaves.

MAINTENANCE/THERAPEUTIC RANGE

10 mg to 50 mg (standardized to 1% to 3% corosolic acid).

POSSIBLE THERAPEUTIC APPLICATIONS

Diabetes (type 2).

COMMENTS

Animal research suggests that banaba leaf may also be helpful for people who are trying to lose weight.

CAUTIONS

Consult with your health practitioner if you are taking medication for diabetes, since you may have to make dosage adjustments. Avoid if you have low blood sugar (hypoglycemia).

Benfotiamine

DESCRIPTION/FUNCTION

Benfotiamine is classified as a fat-soluble form of vitamin B1.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Nutritional supplements.

MAINTENANCE/THERAPEUTIC RANGE

100 mg to 300 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Neuropathy.

COMMENTS

Thiamin hydrochloride and thiamin mononitrate are common forms used in supplements and food fortification. As a fat-soluble analog of vitamin B1, benfotiamine has a much greater percentage of absorption.

CAUTIONS

None known.

Beta-Carotene

DESCRIPTION/FUNCTION

Beta-Carotene is classified as a member of the carotenoid family. There are more than 500 different carotenoids, including other carotenes, xanthophylls, and lycopene. Beta-carotene is a precursor (provitamin A) to retinol (preformed vitamin A). It is converted to vitamin A in the liver as needed. As a source of vitamin A, beta-carotene is: essential for normal growth, development, and maintenance of epithelial tissue; essential to the integrity of night vision; helps provide for normal bone development; influences normal tooth formation; necessary for wound healing.

DRI (RDA or AI for Adults)

None. 12 mcg = 1 RAE (Retinol Activity Equivalents). About 14% of beta-carotene is absorbed. (Previously believed 33%.)

MAJOR SOURCES

Yellow and dark green vegetables (carrots, squash, peas, broccoli, sweet potatoes, peppers, spinach, 'green' lettuce), orange fruits.

MAINTENANCE/THERAPEUTIC RANGE

10 mg to 50 mg (2,774 IU to 13,875 IU).

To convert mg to IU: multiply by 1,000, divide by 12, then multiply by 3.33. See Vitamin A. Avoid synthetic beta-carotene.

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer (breast, colorectal, gastric, ovarian, prostate); macular degeneration.

COMMENTS

Determining the effectiveness of beta-carotene is difficult, since most of the research is epidemiological. Foods that are high in it often also contain lutein, lycopene, zeaxanthin, and hundreds of other carotenoids, as well as vitamins and other ingredients. Research using only isolated beta-carotene has been disappointing. Use beta-carotene supplements that come from natural sources (usually *Dunaliella salina* algae), which therefore also contain a mix of the other carotenoids.

CAUTIONS

High doses can cause yellow or orange skin pigmentation.

Beta-Glucans

(Beta-1,3 Glucan; Beta-1,4 Glucan; Beta-1,6 Glucan)

DESCRIPTION/FUNCTION

Beta-glucans are primarily polysaccharide extracts from a variety of food sources. These extracts are composed of linkages of glucan backbones and side chains. (Glucans are a group of glycan polysaccharides that are composed of linked chains of glucose.) Sources of beta-glucans will usually contain several different kinds of linkages. For example, mushrooms and baker's yeast often contain 1,3 and 1,6 linkages, whereas oats contain 1,3 and 1,4 linkages. One kind of linkage will form the backbone and the other, the side chains.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Barley, mushrooms, oats, yeast.

MAINTENANCE/THERAPEUTIC RANGE

5 mg to 40 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer; HIV/AIDS; high cholesterol; immune support; wound healing.

COMMENTS

Most of beta-glucan research has been done on mushrooms, including *Lentinus edodes* (shiitake), *Grifola frondosa* (maitake), and *Coriolus versicolor* (turkey tail). Beta-glucans absorb better on an empty stomach.

CAUTIONS

None significant.

Beta-Sitosterol

DESCRIPTION/FUNCTION

Beta-Sitosterol is classified as a phytosterol. It is the plant equivalent of cholesterol, which only comes from animals.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Contained in the oils of a variety of herbs, including astragalus, cat's claw, dong quai, fennel, garlic, ginseng, hawthorn, licorice, pau d'arco, peanuts, pumpkin seeds, pygeum, rehmannia, rice bran oil, St. John's wort, sarsaparilla, saw palmetto, stinging nettle, tribulus terrestris, valerian.

MAINTENANCE/THERAPEUTIC RANGE

50 mg to 5,000 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

High cholesterol; prostate problems.

COMMENTS

Lower dosage range for benign prostatic hyperplasia (BPH), and higher dosage range for lowering cholesterol. Sources used for BPH include pygeum africanum, saw palmetto, and stinging nettle.

CAUTIONS

None significant, but high doses of beta-sitosterol may decrease the absorption of beta-carotene and vitamin E.

Betaine Anhydrous / Betaine Hydrochloride

(Betaine or Trimethylglycine; Betaine HCl)

DESCRIPTION/FUNCTION

Originally found in beets, betaine is the major metabolite of choline. Betaine (trimethylglycine or TMG) can donate methyl groups, whereas betaine hydrochloride can increase hydrochloric acid in the stomach.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Nutritional supplements.

MAINTENANCE/THERAPEUTIC RANGE

Betaine: 500 mg to 5,000 mg per day.

Betaine HCl: 250 mg to 650 mg with or after each meal.

POSSIBLE THERAPEUTIC APPLICATIONS

Coronary heart disease (betaine); digestion (betaine HCl).

COMMENTS

Betaine (TMG) can donate a methyl group, which may lower homocysteine levels, an independent risk factor for coronary artery disease. When betaine donates one of its methyl groups to homocysteine, methionine and dimethylglycine (DMG) are formed. Betaine HCl may be helpful for people who have reduced or no stomach acid secretion (hypochlorhydria or achlorhydria). As we age, stomach acid secretion usually decreases. Betaine HCl, often combined with pepsin (a gastric enzyme), facilitates protein digestion in the stomach.

CAUTIONS

Betaine: none known. Betaine HCl: avoid if you have stomach ulcers or GERD (gastroesophageal reflux disease).

Bilberry

(Vaccinium myrtillus)

DESCRIPTION/FUNCTION

The European bilberry is related to the North American blueberry. Bilberry fruit contains anthocyanosides, caffeic acid (chlorogenic acid), flavonoids, and tannins.

DRI (RDA or AI for Adults)

None.

MAJOR SOURCES

Fruit.

MAINTENANCE/THERAPEUTIC RANGE

50 mg to 500 mg of fruit extract (standardized to 25% anthocyanosides).

POSSIBLE THERAPEUTIC APPLICATIONS

Bruising; cancer; cataracts; coronary heart disease; retinopathy; ulcers; varicose veins; wound healing.

COMMENTS

Bilberry also has antioxidant properties. Most recent research shows that bilberry fruit may not improve night vision, but does show improvements in pupillary dynamics. Bilberry leaf may be helpful with diabetes.

CAUTIONS

None significant with the fruit.

Biotin

DESCRIPTION/FUNCTION

Biotin is classified as a member of the B-vitamins. It is an essential component of some enzymes (carboxylases), and is involved in synthesis and breakdown of fatty acids and amino acids through aiding the addition and removal of carbon dioxide to or from active compounds, and the removal of NH₂ from amino acids.

DRI (RDA or AI for Adults)

Adults: 30 mcg.
Lactation: 35 mcg.

MAJOR SOURCES

Nuts and eggs. Biotin can also be produced by bacteria in the intestines.

MAINTENANCE/THERAPEUTIC RANGE

30 mcg to 1,000 mcg.

POSSIBLE THERAPEUTIC APPLICATIONS

Diabetes.

COMMENTS

Biotin may help with brittle nails by increasing thickness. Biotin can be produced by the beneficial bacteria in the large intestine.

CAUTIONS

None known.

Bitter Melon

(*Momordica charantia*)

DESCRIPTION/FUNCTION

Bitter melon is a member of the cucumber family and is related to the Chinese cucumber. It is used as a vegetable in various Asian countries. Its health benefits come from the unripe melon. Active ingredients, mostly polypeptides, include MAP-30, polypeptide-P, alpha-, beta-, and gamma-momorcharin, and charantin.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Fruit and seeds.

MAINTENANCE/THERAPEUTIC RANGE

1 to 2 ounces of fresh juice. Supplements are also available, sometimes standardized to contain 0.5% charantin.

POSSIBLE THERAPEUTIC APPLICATIONS

Diabetes; HIV/AIDS.

COMMENTS

MAP-30 (momordica anti-human immunodeficiency virus protein) exhibits a number of properties for inhibiting HIV, at least *in vitro*. Bitter melon juice is also used topically for psoriasis and other skin conditions.

CAUTIONS

Avoid if pregnant. Consult with your health practitioner if you have diabetes: you may need to lower your antidiabetic medication. Also, blood glucose tests may have lower values.

Black Cohosh

(*Actaea racemosa*; formerly *Cimicifuga racemosa*)

DESCRIPTION/FUNCTION

Black cohosh is native to the eastern half of North America. It was used by Native Americans mostly for gynecological problems, while physicians in the 1800s used it for menstrual cramps, fever, and arthritis. Active ingredients include alkaloids (cytisine, methylcytisine), fatty acids, glycosides (racemosin, cimigoside), triterpenes (actein, deoxyactein, acetylactein), organic acids (fukinolic, isoferulic, salicylic, ferulic).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Roots.

MAINTENANCE/THERAPEUTIC RANGE

80 mg to 160 mg (standardized to 2% to 3% triterpene glycosides).

POSSIBLE THERAPEUTIC APPLICATIONS

Menopause; osteoporosis.

COMMENTS

Black cohosh helps with a variety of symptoms associated with menopause, including hot flashes, night sweats, insomnia, nervousness, and irritability. Preliminary research shows that black cohosh may help with osteoporosis. Black cohosh's botanical name has recently been changed from *Cimicifuga racemosa* to *Actaea racemosa*.

CAUTIONS

Avoid if pregnant, or if you have breast cancer or have a high risk of developing breast cancer. Consult with your health practitioner if you have liver problems.

Boron

DESCRIPTION/FUNCTION

Boron is classified as a trace mineral. It influences macromineral metabolism; works with vitamin D and magnesium for adequate bone growth and development; and may increase estrogen levels.

DRI (RDA or AI for Adults)

None.

MAJOR SOURCES

Noncitrus fruits, vegetables, nuts, legumes. Wine and beer also contain boron.

MAINTENANCE/THERAPEUTIC RANGE

1 mg to 5 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Osteoarthritis; osteoporosis.

COMMENTS

There is some evidence that boron may improve mental function, especially in the elderly.

CAUTIONS

None significant.

Boswellia

(*Boswellia serrata*)

DESCRIPTION/FUNCTION

Boswellia is native to India, the Middle East, and Northern Africa. It is also called Indian frankincense, and has been used in Ayurvedic medicine. Active ingredients include carbohydrates (arabinose, galactose, xylose), triterpenes (boswellic acid), and volatile oils (thujene, cymene).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Plant resin from the cut bark.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 1,000 mg (standardized to 65% to 70% boswellic acid).

POSSIBLE THERAPEUTIC APPLICATIONS

Asthma; inflammation; inflammatory bowel disease; osteoarthritis.

COMMENTS

Bible frankincense is called *Boswellia carterii*.

CAUTIONS

None known.

Branched-Chain Amino Acids

(BCAA)

DESCRIPTION/FUNCTION

The branched-chain amino acids consist of three essential amino acids: isoleucine, leucine, valine. These amino acids can act as fuel sources in muscles during physical activity.

DRI (RDA or AI for adults)

Isoleucine (10 mg/kg/day), leucine (14 mg/kg/day), valine (10 mg/kg/day).

MAJOR SOURCES

Protein foods.

MAINTENANCE/THERAPEUTIC RANGE

5 g to 20 g.

POSSIBLE THERAPEUTIC APPLICATIONS

Anorexia; diabetes; tardive dyskinesia.

COMMENTS

BCAAs may improve athletic performance. BCAAs may reduce manic symptoms by reducing dopamine and noradrenaline levels. As with all amino acids, to maximize benefit, supplements should be taken on an empty stomach, or at least separate from protein foods.

CAUTIONS

Consult with your health practitioner if you have ALS (Lou Gehrig's disease), diabetes, or are a chronic alcoholic.

Bromelain

DESCRIPTION/FUNCTION

Bromelain comes from the pineapple plant, primarily from the stem. Its health benefits come from the proteolytic enzymes (protein digesting) contained in the uncooked plant.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Pineapple stem, but also found in the raw fruit and juice.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 2,000 mg. Bromelain is usually standardized to GDU (gelatin digesting units) or MCU (milk clotting units). 1 GDU is equal to about 1.6 MCU.

POSSIBLE THERAPEUTIC APPLICATIONS

Allergies; angina pectoris; cancer; immune function; inflammation; osteoarthritis; sinusitis; wound healing.

COMMENTS

Bromelain must be taken on an empty stomach or with food absent of protein. If taken with protein, its proteolytic activity will be used for protein digestion, not for its therapeutic properties. Bromelain taken after exercising can reduce muscle soreness and stiffness. Bromelain has also been used to treat diarrhea caused by enterotoxigenic *E. coli*.

CAUTIONS

None significant, although may cause some blood thinning.

Burdock

(Arctium lappa)

DESCRIPTION/FUNCTION

Burdock is a weed native to Europe, northern Asia, and North America. It has bristly burrs that cling to clothing and animals' fur. Active ingredients include caffeic acid derivatives (chlorogenic acid), lignans (neochlorogenic acid), polysaccharides (inulin, mucilage), polyphenols, phytosterols (beta-sitosterol, stigmasterol, campesterol), tannins, triterpenes.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Roots.

MAINTENANCE/THERAPEUTIC RANGE

1,000 mg to 5,000 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Acne vulgaris; kidney stones.

COMMENTS

There isn't much research on the use of burdock root for humans. Other than historical use, most research has been done on animals. Animal research shows burdock may have antibacterial, anticancer, antioxidant, and anti-inflammatory properties, as well as protecting the liver against some poisons.

CAUTIONS

Avoid if pregnant (may stimulate the uterus).

Butcher's Broom

(Ruscus aculeatus)

DESCRIPTION/FUNCTION

Butcher's broom is a short evergreen shrub native to countries around the Mediterranean. Active ingredients include lipids (tetracosanoic acid, sitosterol, campesterol, stigmasterol), steroid saponins (ruscine, ruscoside, ruscogenin), and benzofuranes (euparone, ruscodibenzofurane).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Rhizome and roots.

MAINTENANCE/THERAPEUTIC RANGE

100 mg to 1,000 mg (standardized to 10% ruscogenins).

POSSIBLE THERAPEUTIC APPLICATIONS

Edema; hemorrhoids; poor circulation; premenstrual syndrome; varicose veins.

COMMENTS

Butcher's broom may work better when combined with bioflavonoids and vitamin C.

CAUTIONS

Consult with your health practitioner if you are taking MAO inhibitors. Also, butcher's broom could raise blood pressure when taken with non-drowsy cold medications, including pseudoephedrine and phenylpropanolamine.

Butterbur
(*Petasites hybridus*)

DESCRIPTION/FUNCTION

Butterbur is a perennial shrub native to Europe, northern Africa and southwestern Asia. Active ingredients include sesquiterpenes (petasin, isopetasin) and pyrrolizidine alkaloids (toxic).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Roots, rhizome, and leaves.

MAINTENANCE/THERAPEUTIC RANGE

100 mg to 200 mg (standardized to 15% petasin and isopetasin).

POSSIBLE THERAPEUTIC APPLICATIONS

Allergies; asthma; headache (migraine).

COMMENTS

Butterbur has antispasmodic effects on the smooth muscles in the bladder, and is recommended in Europe for urinary incontinence.

CAUTIONS

Avoid if pregnant. Consult with your health practitioner if you have liver disease. Look for products that have had their detrimental pyrrolizidine alkaloids removed.

Butylated Hydroxytoluene (BHT)

DESCRIPTION/FUNCTION

BHT is a fat-soluble antioxidant that is often used as a preservative in food and cosmetics.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Nutritional supplements.

MAINTENANCE/THERAPEUTIC RANGE

250 mg to 1,000 mg. Used only during and after (2 weeks) outbreak of herpes lesions. Can also be applied topically.

POSSIBLE THERAPEUTIC APPLICATIONS

Cold sores.

COMMENTS

There is some concern that BHT is a cancer promoter (increases the carcinogenic activities of some chemicals), but other evidence shows that BHT is an anticancer promoter.

CAUTIONS

None significant.

Ca-AEP

(2-Aminoethanol Phosphate)

DESCRIPTION/FUNCTION

A form of calcium that contains 12% elemental calcium bound to 88% amino ethyl phosphoric acid. A component of cell membranes, it plays a role in maintaining membrane integrity and improving cellular functions.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Nutritional supplements.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 1,500 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Diabetes; multiple sclerosis.

COMMENTS

Limited research, most dating back 30 or more years.

CAUTIONS

None known.

Calcium

DESCRIPTION/FUNCTION

Calcium is classified as a macromineral. It builds and maintains bones and teeth; essential in blood clotting; influences transmission of ions across cell membranes; required in nerve transmission and muscle contraction; enzyme activation.

DRI (RDA or AI for Adults)

Under age 51: 1,000 mg. 51 years and older: 1,200 mg.

MAJOR SOURCES

Dairy products, sardines w/bones, blackstrap molasses, almonds, spinach, tofu, filberts, Brazil nuts, soynuts, collard greens.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 1,500 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer (colorectal); high blood pressure; high cholesterol; obesity; osteoporosis; premenstrual syndrome.

COMMENTS

Calcium bound to organic acids (ascorbic, citric, malic, lactic, etc.) absorbs better than inorganic calcium salts (carbonate) if there is reduced stomach acid production (hypo- or achlorhydria). The carbonate form can cause gastrointestinal problems. Some calcium supplements (bone meal, carbonate) may contain lead, but calcium reduces lead absorption, so this may not be significant at low levels of lead. Vitamin D increases calcium absorption.

CAUTIONS

Consult with your health practitioner if there is a tendency to form calcium-containing kidney stones.

Calcium D-Glucarate

DESCRIPTION/FUNCTION

Calcium D-Glucarate is a salt of D-glucaric acid consisting of about 12% calcium. D-Glucaric acid is involved in glucuronidation, a process of detoxification. In the liver, glucuronides are formed and excreted in bile and urine. This is the primary pathway of biotransformation for many drugs and poisons.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

D-Glucaric acid is found in some fruits and vegetables, including apples, oranges, and cruciferous vegetables (broccoli, cabbage, cauliflower, etc.).

MAINTENANCE/THERAPEUTIC RANGE

200 mg to 500 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer.

COMMENTS

Besides DIM and I3C, this may be another reason why cruciferous vegetables have anticancer properties. Also, animal research suggests that D-glucarate may help in lowering total and LDL-cholesterol.

CAUTIONS

None known.

Caprylic Acid

DESCRIPTION/FUNCTION

Caprylic acid is a medium-chain, saturated fatty acid. In supplements, it may be in the form of calcium or sodium caprylate.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Coconut and palm oils.

MAINTENANCE/THERAPEUTIC RANGE

300 mg to 1,000 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Infection (fungal).

COMMENTS

Various salts of caprylic acid have been used to treat intestinal yeast infection (*Candida albicans*), but there is little evidence that it is helpful. Since it is absorbed more slowly into the blood stream, the timed-release form may be more effective.

CAUTIONS

None known.

Carnitine

(L-Carnitine; Acetyl-L-Carnitine; Propionyl-L-Carnitine)

DESCRIPTION/FUNCTION

Carnitine is classified as vitamin-like, although it is often referred to as being an amino acid. Maybe that is because two amino acids are involved in its synthesis: lysine forms its backbone, and methionine donates a methyl group. Its synthesis also requires vitamin C, vitamins B3 and B6, and iron. Carnitine transports long-chain fatty acids into the cell's mitochondria, where the fatty acids are burned (beta-oxidation) to produce energy.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Meat.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 5,000 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Aging; angina pectoris; congestive heart failure; high triglycerides; hyperthyroidism; infertility (male); myocardial infarction; poor circulation (PLC).

COMMENTS

Carnitine is particularly good for the heart, since the heart gets the majority of its energy from fat. Other forms of carnitine, acetyl-L-carnitine (ALC) and propionyl-L-carnitine (PLC), have added benefits. If they do not consume enough legumes, vegans may need supplementation due to lower levels of lysine in their diet. As with amino acids, carnitine should be taken on an empty stomach, or at least separate from protein foods.

CAUTIONS

Consult with your health practitioner if you have seizures or hypothyroidism.

Carnosine

DESCRIPTION/FUNCTION

Carnosine is a dipeptide composed of one molecule each of the amino acids, histidine and alanine. It is found mostly in muscle tissue, including the heart, and the nervous system, including the brain.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Meat.

MAINTENANCE/THERAPEUTIC RANGE

50 mg to 1,500 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Aging; cataracts; memory loss; neuropathy; wound healing.

COMMENTS

Advanced glycosylated end products (AGEs) are abnormal proteins that seem to be involved in the aging process. Carnosine inhibits protein glycosylation. Diabetics have increased glycosylation, and carnosine may protect against their tendency for cataracts and neuropathy. Research showed that N-Acetylcarnosine, in the form of eye drops, was able to reverse cataracts. Carnosine also has antioxidant properties. It should be taken on an empty stomach, in divided doses.

CAUTIONS

None known.

Cascara Sagrada

(Rhamnus purshiana)

DESCRIPTION/FUNCTION

Cascara is a plant native to the northwestern United States. It grows as a bush or tree. Active ingredients include anthraglycosides (cascarosides).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Tree bark.

MAINTENANCE/THERAPEUTIC RANGE

50 mg to 100 mg (standardized to 20% anthraquinone glycosides).

POSSIBLE THERAPEUTIC APPLICATIONS

Constipation.

COMMENTS

Only use as much as needed to achieve a soft stool.

CAUTIONS

Consult with your health practitioner if you are taking potassium depleting diuretics, digitalis, or licorice, or if you have other GI problems (e.g., bowel obstruction, Crohn's disease, irritable bowel, ulcerative colitis). Do not use for more than one or two weeks.

Cat's Claw

(Uncaria tomentosa)

DESCRIPTION/FUNCTION

Cat's Claw is a plant native to the highlands of the Peruvian Amazon. Another common name for it is Una de Gato, although this name is also used for many other plants. Active ingredients include alkaloids (pteropodine, rhynchophylline, uncarine E), triterpenes, organic acids (oleanolic, ursolic), glycosides (quinovic acid), procyanidins (epicatechin, cinchonain), and sterols (beta-sitosterol, stigmasterol, campesterol).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Root bark.

MAINTENANCE/THERAPEUTIC RANGE

200 mg to 400 mg (standardized to 2% oxindole alkaloids).

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer; immune function; inflammation; memory loss; osteoarthritis; rheumatoid arthritis.

COMMENTS

Cat's claw may reduce fertility in women.

CAUTIONS

Avoid if pregnant. Consult with your health practitioner if you have an autoimmune disease (e.g., MS, SLE), or are taking a blood thinning drug. This is a particularly strong herb and should be avoided during pregnancy and breast feeding (as should be with many herbs).

Cayenne

(Capsicum annuum; Capsicum frutescens)

DESCRIPTION/FUNCTION

Cayenne pepper is native to Central and South America, and the plant belongs to the nightshade family. Also called chili pepper, its pepper relatives include habanero, jalapeno, bell, and paprika. Active ingredients include capsaicinoids, carotenoids, flavonoids, steroid saponins, and volatile oils.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Fresh or dried fruit.

MAINTENANCE/THERAPEUTIC RANGE

1,000 mg to 3,000 mg. (Strength can vary considerably.)

POSSIBLE THERAPEUTIC APPLICATIONS

Topical: fibromyalgia; neuropathy; osteoarthritis; psoriasis; rheumatoid arthritis; shingles.

Internal: ulcers (peptic).

COMMENTS

Most of cayenne's benefits come from its topical applications (capsaicin cream). It causes the release of substance P, which is involved in pain transmission. Initial application causes pain, but then substance P becomes depleted. The strength of peppers is measured two ways: in Scoville Units or Chili Heat Scale. Bell peppers score less than 100 Scoville Units and 0 on the Chili Heat Scale. At the other end of the spectrum is the habanero, coming in at 100,000 to 300,000 Scoville Units or 10 on the Chili Heat Scale.

CAUTIONS

Consult with your health practitioner if you are on blood thinning drugs or the asthma drug, theophylline. Keep away from open wounds, eyes, and mucous membranes.

Cetyl Myristoleate

(CMO)

DESCRIPTION/FUNCTION

Cetyl myristoleate is an ester of cetyl alcohol and myristoleic acid, a fatty acid. It is found in beavers, mice, and whales.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

CMO is usually manufactured from the myristoleic acid content of bovine (cattle) sources.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 1,500 mg. The higher range is usually taken daily for one month. Thereafter, lower "booster" dosages are taken at regular intervals.

POSSIBLE THERAPEUTIC APPLICATIONS

Inflammation; osteoarthritis; rheumatoid arthritis.

COMMENTS

Limited research on humans. CMO seems to lubricate joints and muscles. Besides taken orally, preparations exist for topical application. CMO products may contain equal amounts of CMO and cetyl oleate (40% of each).

CAUTIONS

None significant, other than possible mild GI symptoms.

Chamomile

(German: *Matricaria recutita* or *Matricaria chamomilla*)

(Roman: *Chamaemelum nobile* or *Anthemis nobilis*)

DESCRIPTION/FUNCTION

Chamomile is native to Europe. Both German and Roman chamomile belong to the family, Asteraceae (formerly Compositae). Active ingredients include volatile oils (various bisabolol, bisabololone, chamazulene), polyphenols/flavonoids (apigenin, luteolin, quercetin, coumarin), mucilages.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Primarily the flowers.

MAINTENANCE/THERAPEUTIC RANGE

2 g to 10 g (standardized to 1% apigenin).

POSSIBLE THERAPEUTIC APPLICATIONS

Anxiety; inflammation; insomnia; wound healing (topical).

COMMENTS

German and Roman chamomile are different, but they also have similar properties. German chamomile (also called Hungarian chamomile) is more common and has more research done on it. Chamomile tea is often drunk to relieve indigestion. Many skin care products contain chamomile extracts.

CAUTIONS

Roman chamomile should be avoided if pregnant. People with asthma, or who are allergic to members of the Asteraceae (Compositae) family (arnica, daisy, marigold, ragweed, tansy, yarrow, etc.), may react to chamomile.

Chasteberry

(Vitex agnus-castus)

DESCRIPTION/FUNCTION

Chasteberry comes from the Chaste Tree, and is a bush or tree that is native to the Mediterranean region. Active ingredients include flavonoids (casticin, isovitexin, kaempferol, orientin, quercetagenin, vitexin, vitexicarpin, vitricin), iridoid glycosides (agnoside, aucubin), volatile oils/diterpenes (cineol, pinene, limonene, sabinene, vitexilactone).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Fruit.

MAINTENANCE/THERAPEUTIC RANGE

4 mg to 400 mg, depending on the concentration. (Some products are standardized to 0.5% agnoside or 0.6% aucubin. Others are standardized to contain 5% vitexicarpin and 1% vitricin. Follow label recommendations.)

POSSIBLE THERAPEUTIC APPLICATIONS

Acne; fibrocystic breasts; infertility (female); premenstrual syndrome.

COMMENTS

To take effect, chasteberry usually needs to be taken on a regular basis for 4 to 6 months for some conditions, and up to 18 months for others. Some experts recommend taking chasteberry on an empty stomach in the morning. If taken for infertility, stop when pregnancy is confirmed.

CAUTIONS

Avoid if pregnant. Consult with your health practitioner if you have a hormone-sensitive cancer (breast, ovarian, uterine). Also, may need to be avoided if you are taking various medications, including antipsychotics, contraceptives, or dopamine agonists.

Chitosan

DESCRIPTION/FUNCTION

Chitosan is derived from chitin, a substance forming the hard outer shell (exoskeleton) of marine invertebrates (crabs, lobsters, shrimp) and arthropods (insects, such as beetles, crickets, etc.). It consists of long chains of polysaccharides (glucose units), mostly glucosamine and acetylglucosamine (see glucosamine sulfate).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Processed shells of crabs and shrimp.

MAINTENANCE/THERAPEUTIC RANGE

1 g to 3 g.

POSSIBLE THERAPEUTIC APPLICATIONS

Crohn's disease (combined with ascorbic acid); high cholesterol; obesity; wound healing (topical).

COMMENTS

After ingestion, chitosan acts as a fiber. It can bind to fat in the diet. It is promoted for weight loss, but little research shows that it is effective. Chitosan may be helpful with renal (kidney) failure.

CAUTIONS

None significant, but be careful if you are allergic to shellfish. Chitosan may reduce the absorption of the fat-soluble vitamins, as well as calcium.

Chlorella

(Chlorella pyrenoidosa; Chlorella vulgaris)

DESCRIPTION/FUNCTION

Chlorella is a freshwater, unicellular green algae. Chlorella appeared about 2.5 billion years ago. As a “green food”, it contains carotenoids (beta-carotene, etc.), vitamins, minerals, and amino acids.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Commercially grown and harvested chlorella.

MAINTENANCE/THERAPEUTIC RANGE

5 g to 10 g.

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer; fibromyalgia; high cholesterol; immune function.

COMMENTS

Most research is limited to animals, or small-scale human studies. For chlorella to be digested, its cell wall must be broken or “cracked”. The liquid form of chlorella is claimed to contain chlorella growth factor (CGF). Chlorella contains vitamin B12, but it may not be in an active form to benefit vegans. Chlorella may help in the detoxifying of various chemicals.

CAUTIONS

Consult with your health practitioner if you are taking a blood thinning drug, since chlorella can contain significant amounts of vitamin K. Some people may be allergic to chlorella, especially if they have an allergy to iodine.

Choline

(Phosphatidylcholine; Lecithin)

DESCRIPTION/FUNCTION

Choline is classified as a member of the B-vitamins. It is a component of the neurotransmitter, acetylcholine, and of the phospholipids, sphingomyelin and phosphatidylcholine (PC); important to the structure of all cell membranes, plasma lipoproteins, and pulmonary surfactant.

DRI (RDA or AI for Adults)

Males: 550 mg. Females: 425 mg.
Pregnancy: 450 mg. Lactation: 550 mg.

MAJOR SOURCES

Liver, oatmeal, soybeans, cauliflower, and kale. Phosphatidylcholine is found in eggs, liver, soybeans, peanuts.

MAINTENANCE/THERAPEUTIC RANGE

200 mg to 3,000 mg, depending on the form.

POSSIBLE THERAPEUTIC APPLICATIONS

Asthma; coronary heart disease; liver support (hepatitis B, C); memory loss (CDP or GPC); Parkinson's disease (CDP or GPC); stroke (CDP or GPC).

COMMENTS

Common forms of choline include: bitartrate, chloride, phosphatidyl. Less common forms are cytidine diphosphate (CDP-choline or citicholine) and alpha-glycerolphosphoryl (alpha-GPC-choline). Recent research involves mostly CDP and GPC. Choline is particularly important for fetal brain development. Some choline is metabolized to betaine (trimethylglycine or TMG). TMG is a methyl donor, and thus can help to reduce homocysteine levels. Soy lecithin contains primarily phosphatidylcholine (PC) and phosphatidylinositol.

CAUTIONS

None significant, although a very small percentage of people (<1%) accumulate trimethylamine, a metabolite of choline. This can lead to fishy body odor.

Chondroitin Sulfate

DESCRIPTION/FUNCTION

Chondroitin sulfate exists in several forms, including chondroitin sulfate A (chondroitin 4-sulfate), chondroitin sulfate B (dermatan sulfate, but now not considered a true chondroitin sulfate), and chondroitin sulfate C (chondroitin 6-sulfate). Chondroitin sulfate and glucosamine are found in connective tissue (cartilage, tendons, bone, skin, arterial walls). Chondroitin sulfate is made up of repeating units of galactosamine (based on the sugar, galactose, which is part of milk sugar, lactose) and glucuronic acid. Chondroitin sulfate belongs to a family of polysaccharides called glycosaminoglycans (formerly called mucopolysaccharides. These in turn are combined with protein to form proteoglycans.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Bovine (cow) trachea, porcine (pig) ears and snouts, and shark cartilage.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 2,000 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Coronary heart disease; inflammation; kidney stones; osteoarthritis.

COMMENTS

Chondroitin sulfate can help with arthritis in two ways. First, it reduces inflammation, as do various pain relievers. However, unlike pain killers, chondroitin sulfate helps to rebuild lost cartilage in the joints. It usually takes several weeks before the effects are noticed.

CAUTIONS

Consult with your health practitioner if you are taking a blood thinning drug, or have prostate cancer.

Chromium

DESCRIPTION/FUNCTION

Chromium is classified as a trace mineral. It is required for normal glucose metabolism; insulin cofactor.

DRI (RDA or AI for Adults)

Under age 51: 35 mcg (Males); 25 mcg (Females).
Ages 51 and older: 30 mcg (Males); 20 mcg (Females).
Pregnancy: 30 mcg. Lactation: 45 mcg.

MAJOR SOURCES

Clams, whole grains, brewer's yeast, meat.

MAINTENANCE/THERAPEUTIC RANGE

100 mcg to 1,000 mcg.

POSSIBLE THERAPEUTIC APPLICATIONS

Coronary heart disease; diabetes; high cholesterol; low blood sugar; obesity.

COMMENTS

Brewer's yeast contains significant amounts of chromium. Two popular forms of supplemental chromium are picolinate and polynicotinate. Glucose tolerance factor (GTF) is a complex that assists insulin in blood sugar metabolism, and this factor consists of chromium, niacin, and three amino acids. Therefore, the polynicotinate form may be preferable.

CAUTIONS

None significant, but high doses may cause headaches.

Chrysin

DESCRIPTION/FUNCTION

Chrysin is classified as a flavone flavonoid. It is found in bee propolis, passionflower species, skullcap, and pine trees.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Passiflora coerulea, a variety of passionflower.

MAINTENANCE/THERAPEUTIC RANGE

1,000 mg to 1,500 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Anxiety; cancer; gout; HIV/AIDS.

COMMENTS

Chrysin has the potential of being an aromatase inhibitor. That is, it can reduce the conversion of androgens (androstenedione and testosterone) to estrogen. The problem is that chrysin does not absorb well. Chrysin appears to inhibit xanthine oxidase and reduce uric acid production, thus potentially helping with gout.

CAUTIONS

Do not take if you have prostate cancer. Consult with your health practitioner if you have a hormone-sensitive cancer (breast, ovarian, uterine).

Cinnamon

(True: *Cinnamomum verum* or *Cinnamomum zeylanicum*)
(Chinese: *Cinnamomum aromaticum* or *Cinnamomum cassia*)

DESCRIPTION/FUNCTION

True cinnamon is native to Sri Lanka and India. Chinese cinnamon is native to China, Viet Nam, Laos, and Burma. Active ingredients include diterpenes (cinnzeylanol, cinnzeylanin), polyphenols (methylhydroxychalcone polymer, oligomeric proanthocyanidins, tannins (catechin tannins), volatile oils (cinnamaldehyde, eugenol, cinnamic acid).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Bark.

MAINTENANCE/THERAPEUTIC RANGE

Bark powder: 1 g to 4 g, prepared as tea.
Cinnamon extract (Cinnulin PF): 250 mg to 500 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Diabetes; indigestion; parasites.

COMMENTS

It has been thought that methylhydroxychalcone polymer (MHCP) was responsible for cinnamon's insulin-potentiating properties. Some now believe that it is polyphenol polymers, called Type-A polymers, that are responsible for cinnamon's beneficial effects on glucose metabolism. Cinnulin PF is a patented, water extract of Chinese cinnamon for increasing insulin sensitivity.

CAUTIONS

Consult with your health practitioner if you have low blood pressure or congestive heart failure. If you are diabetic, you may have to adjust your medication.

Citrus Bioflavonoids

(Hesperidin; Naringin; Quercitrin; Rutin)

DESCRIPTION/FUNCTION

There are several thousand kinds of bioflavonoids found throughout the plant kingdom. They are part of the polyphenol family. Citrus fruits contain at least four bioflavonoids. At one time they were unofficially called vitamin P, because they reduced capillary fragility and permeability.

DRI (RDA or AI for Adults)

None.

MAJOR SOURCES

Lemons, limes, oranges, grapefruit.

MAINTENANCE/THERAPEUTIC RANGE

100 mg to 1,000 mg. (Only use standardized extracts.)

POSSIBLE THERAPEUTIC APPLICATIONS

Bruising; cancer; hemorrhoids; high cholesterol; inflammation; ulcers.

COMMENTS

Bioflavonoids usually have antioxidant properties. They also seem to work well with vitamin C. Rutin is metabolized to quercetin (listed separately, because it may be responsible for rutin's benefits). The quercitrin found in citrus is related to quercetin. Avoid supplements that list bioflavonoids on the label, but do not list a standardized percentage. These often will only contain about 5% active bioflavonoids. Quality products will contain 40% to 50% total bioflavonoids.

CAUTIONS

None significant, although grapefruit can interfere with various medications.

Coenzyme Q10 (CoQ10)

(Ubiquinone; Ubiquinol)

DESCRIPTION/FUNCTION

There are many metabolic pathways in the body. One is the electron transport chain, where CoQ10 facilitates electron flow. The electron transport chain enables oxidative phosphorylation, which produces adenosine triphosphate (ATP), often described as the energy currency of the body. CoQ10 is also a fat-soluble antioxidant. Another name for coenzyme Q is ubiquinone, because it is a quinone (a chemical class that also includes vitamins E and K), and it is ubiquitous (it is found in almost all animal cells).

DRI (RDA or AI for Adults)

None.

MAJOR SOURCES

Made in the body and nutritional supplements.

MAINTENANCE/THERAPEUTIC RANGE

25 mg to 1,200 mg. (Therapeutic dosages range from 100 mg to 400 mg, except for Parkinson's Disease at 1,200 mg.)

POSSIBLE THERAPEUTIC APPLICATIONS

Angina pectoris; cancer (breast); cardiomyopathy; congestive heart failure; diabetes; gum disease; headache (migraine); high blood pressure; high cholesterol; HIV/AIDS; infertility (male); mitral valve prolapse; Parkinson's disease.

COMMENTS

Many statin-class cholesterol lowering drugs reduce the body's production of CoQ10, and therefore increase the need for its supplementation. Like vitamin E, CoQ10 is fat-soluble and should be taken with food. Even though ubiquinone is an antioxidant, it is in an oxidized state. The reduced form of CoQ10 is called ubiquinol, and it has greater antioxidant properties.

CAUTIONS

None significant. There was concern that CoQ10 might interfere with warfarin (Coumadin), but that does not appear to be the case. If you are taking it for congestive heart failure, do not abruptly stop taking it.

Coleus Forskohlii

(Coleus forskohlii)

DESCRIPTION/FUNCTION

Coleus forskohlii is native to India, and has a long history of use in Ayurvedic medicine. The primary therapeutic ingredient in Coleus is the diterpene, forskolin.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Roots.

MAINTENANCE/THERAPEUTIC RANGE

100 mg to 500 mg (standardized to 10% to 18% forskolin).

POSSIBLE THERAPEUTIC APPLICATIONS

Asthma; congestive heart failure; glaucoma; obesity.

COMMENTS

Most of Coleus's benefits come from its active principal, forskolin, being delivered in specific ways: inhaled (asthma), intravenous (heart failure), glaucoma (eye drops). These are purified products and similar benefits may not come from the whole herb, which should not be inhaled, injected, or put in the eye. As for obesity, a forskolin extract has shown modest effects in reducing weight by increasing fat metabolism through increased lipolysis.

CAUTIONS

Consult with your health practitioner if you are taking a blood thinning drug, or heart medications (calcium channel blocker or nitroglycerin).

Colostrum

DESCRIPTION/FUNCTION

Colostrum is a thin, yellowish fluid (milk) that is secreted by mammals for several days after giving birth. It is especially important for conferring immunity (mother's antibodies) to the infant. Active ingredients include cytokines, epidermal growth factor, immunoglobulins, insulin-like growth factors, interleukins, lactoferrin.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Cow or goat colostrum.

MAINTENANCE/THERAPEUTIC RANGE

1 g to 20 g.

POSSIBLE THERAPEUTIC APPLICATIONS

Diarrhea; immune function; ulcerative colitis.

COMMENTS

Colostrum may benefit athletic performance, possibly by increasing muscle growth.

CAUTIONS

None significant.

Conjugated Linoleic Acid

(cis-9, trans-11 CLA; trans-10, cis-12 CLA)

DESCRIPTION/FUNCTION

Linoleic acid is an essential, omega-6 fatty acid. CLA is the name used for a group of modified forms of linoleic acid that contain two double bonds (conjugation), beginning at the ninth or tenth carbons. There are eight isomers of CLA, but two have garnered the most interest: cis-9, trans-11 and trans-10, cis-12 isomers. Unlike linoleic acid, CLA does not get converted to arachidonic acid.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Dairy products and beef. Vegetable oils can be processed to produce CLA.

MAINTENANCE/THERAPEUTIC RANGE

1 g to 6 g.

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer (breast, colorectal, lung, prostate, skin); diabetes; high cholesterol; high triglycerides; obesity.

COMMENTS

For weight loss, CLA seems to exert a repartitioning effect: fat cells are reduced in size, thus reducing fat mass and increasing lean body mass. (It helps to also exercise while taking CLA.) Recent evidence points to the trans-10, cis-12 isomer as being more effective. Some products will contain both isomers. CLA should be taken about 30 min. before each meal.

CAUTIONS

Recent research has shown that long-term use of CLA can have certain negative effects (increased C-reactive protein and insulin resistance; reduced HDL-cholesterol) that could increase the risk for heart disease.

Copper

DESCRIPTION/FUNCTION

Copper is classified as a trace mineral. It facilitates the function of many enzymes and iron (ceruloplasmin); may be an integral part of RNA and DNA molecules; role in development of connective tissue and blood vessels (lysyl oxidase), and formation of phospholipids and melanin. Copper is also a component of one form of superoxide dismutase (SOD), an enzyme that has antioxidant properties (converts superoxide to hydrogen peroxide).

DRI (RDA or AI for Adults)

Adults: 0.9 mg.
Pregnancy: 1.0 mg. Lactation: 1.3 mg.

MAJOR SOURCES

Oysters, meat, chocolate, nuts, grains, legumes.

MAINTENANCE/THERAPEUTIC RANGE

1 mg to 3 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Immune function; osteoarthritis.

COMMENTS

High doses of vitamin C and zinc can reduce copper absorption. Homes with copper plumbing may have tap water with too much copper. Run the water for a minute or two to clear out long-standing water in the copper pipes.

CAUTIONS

Do not take if you have Wilson's disease, a copper storage disorder, or kidney or liver failure.

Cordyceps

(*Cordyceps sinensis*)

DESCRIPTION/FUNCTION

Cordyceps is an edible, parasitic fungus that grows on the larva of a caterpillar (*Hepialus varians*). It is found on the high mountain regions of China and Tibet. When the caterpillar dies, a fungus grows on its body. The fungus is now cultivated, instead of being picked off the dead caterpillar. Active ingredients include dipeptides, cordyceptic acid, phytosterols (ergosterol and derivatives), polyamines (putrescine, spermidine, spermine), polysaccharides (CS-OHEP, CS-F30, CS-81002, galactomannans).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Cultivated cordyceps fungus.

MAINTENANCE/THERAPEUTIC RANGE

1 g to 3 g.

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer; cardiac arrhythmia; coronary heart disease; diabetes; high cholesterol; immune function; liver support (hepatitis B).

COMMENTS

CordyMax CS-4 is a fermented strain of cordyceps grown on a proprietary blend of nutrients in a sterile environment. It is recognized by the Chinese Ministry of Health as having the scientifically supported benefits of the natural cordyceps fungus. There are also other pharmaceutical-quality cordyceps products available.

CAUTIONS

None significant.

Cranberry

(American: *Vaccinium macrocarpon*; European: *Vaccinium oxycoccos*)

DESCRIPTION/FUNCTION

Cranberry, which is related to the blueberry, grows wild in marshlands of the colder regions of Europe and North America. The European cranberry produces a smaller berry than its American cousin. Active ingredients include organic acids (benzoic, hippuric, citric, malic, quinic), polyphenols (cyanidin, oligomeric proanthocyanidins, tannins, anthocyanosides, myricetin, quercetin, resveratrol), terpenes (limonene, linalol, myricene, nerol, pinene, terpineol).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Fruit.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 1,500 mg (standardized to 5% to 10% anthocyanosides or anthocyanidins).

POSSIBLE THERAPEUTIC APPLICATIONS

Urinary tract infections.

COMMENTS

It was long thought that cranberry juice was helpful with urinary tract infections (UTIs) because it acidified the urine, making it a less favorable environment for the harmful bacteria. It is now believed that some of cranberry's active principals, including hippuric acid, make it harder for bacteria to adhere to the lining of the urinary tract. Cranberry supplements can reduce the odor of urine, which is helpful for people with urinary incontinence. Because of cranberry's many active ingredients, future research may show it to be helpful for other health problems, including cancer and heart disease.

CAUTIONS

Consult with your health practitioner if you are taking medications, including those for blood thinning, or if you have kidney stones (increases urinary oxalate).

Creatine

DESCRIPTION/FUNCTION

Creatine, produced in the kidneys, liver, and pancreas, is used for supplementary energy transport in certain body systems (brain, heart, muscle cells). It complements adenosine triphosphate (ATP) as an immediate source of usable energy. It is produced in the body (1 to 2 grams daily) from three amino acids (arginine, glycine, methionine).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Animal muscle (herring, salmon, beef) and supplements.

MAINTENANCE/THERAPEUTIC RANGE

1 g to 2 g (sometimes started with a loading dose of 20 g per day for 2 to 5 days).

POSSIBLE THERAPEUTIC APPLICATIONS

Congestive heart failure; muscular dystrophy.

COMMENTS

Creatine supplementation may improve athletic performance in some individuals during some kinds of exercise (short duration, high intensity). Creatine supplements are available in several forms: creatine alpha-ketoglutarate, creatine citrate, creatine monohydrate, creatine phosphate, and creatine pyruvate. Taking creatine with carbohydrates increases its uptake in muscles. Vegetarians may have a more favorable response to creatine supplementation.

CAUTIONS

Consult with health professional if you have kidney problems. Increase water consumption when creatine is used to avoid dehydration.

Dandelion Root

(Taraxacum officinale)

DESCRIPTION/FUNCTION

Dandelion is native to most temperate regions of Europe and Asia. It was brought to North America by early colonists. (The young leaves were used in salads; dandelion wine was made from the flowers; the root was roasted and ground as a coffee alternative.) Active ingredients include sesquiterpene lactones, triterpenes and sterols (beta-sitosterol, taraxasterol, taraxerol), flavonoids (apigenin, luteolin), inulin.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Leaves and roots.

MAINTENANCE/THERAPEUTIC RANGE

2 g to 20 g.

POSSIBLE THERAPEUTIC APPLICATIONS

Liver support (roots); urinary tract infections (leaves).

COMMENTS

Dandelion can stimulate appetite and improve digestion by stimulating acid secretion in the stomach and increasing bile flow.

CAUTIONS

Consult with your health practitioner if you have gallbladder problems, diabetes, gastric ulcers, or are taking a diuretic medication.

Deer Antler Velvet

DESCRIPTION/FUNCTION

Deer antlers come from the frontal bones and are nourished by a highly vascularized, fine-haired skin, called velvet. After the antlers complete their growth, circulation is cut off, and the resulting dead skin (velvet) is shed as the deer rubs its antlers against trees. Active ingredients include amino acids, glycosaminoglycans (chondroitin sulfate A, glucosamine), growth factors (insulin-like growth factor, epidermal growth factor, nerve growth factor, transforming growth factor), hormones (androgens, estrogens), prostaglandins.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Deer velvet.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 2,000 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Wound healing.

COMMENTS

There is research showing that athletes would benefit from taking deer velvet. It may increase endurance and reduce the recovery time after physical exertion.

CAUTIONS

Consult with your health practitioner if you have a hormone-sensitive cancer (breast, ovarian, uterine). People with circulation problems, including congenital heart disease or angina pectoris, should not take deer velvet.

Dehydroepiandrosterone

(DHEA)

DESCRIPTION/FUNCTION

DHEA is a steroid hormone produced in the adrenal cortex of the adrenal glands (also testes in men), and is converted to other hormones, including estrogen and testosterone (via androstenedione). It is the most abundant steroid hormone in the bloodstream and, although it is an androgen (male sex hormone), it is synthesized in both males and females. It is produced in the body from cholesterol via pregnenolone.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Made in the body and nutritional supplements.

MAINTENANCE/THERAPEUTIC RANGE

5 mg to 50 mg (females); 10 mg to 100 mg (males).

POSSIBLE THERAPEUTIC APPLICATIONS

Chronic fatigue syndrome; depression; erectile dysfunction; HIV/AIDS; lupus; memory loss; menopause; obesity; osteoporosis; schizophrenia.

COMMENTS

Maximum production in the body of DHEA is reached by our early twenties, and at 60 years old, we may only be producing about one third as much as we did forty years earlier. DHEA is manufactured in labs from diosgenin found in wild yam extract. However, the human body cannot convert diosgenin into DHEA, so taking wild yam supplements will not increase DHEA levels in the body. In aging skin, DHEA may increase thickness. DHEA is more likely to increase estrogen levels in men, and testosterone levels in women. DHEA does not appear to be contraindicated with prostate cancer.

CAUTIONS

Avoid if pregnant. Consult with your health practitioner if you have a hormone-sensitive cancer (breast, ovarian, uterine), liver problems, or are taking a variety of prescription medications (aromatase inhibitors, corticosteroids, hormones). High doses of DHEA may cause acne and increase facial hair, especially in women.

Devil's Claw

(Harpagophytum procumbens)

DESCRIPTION/FUNCTION

Devil's claw is an herb native to South Africa. Its fruit is covered with small, anchor-like hooks (claws). Devil's claw belongs to the sesame family (*Pedaliaceae*). Active ingredients include carbohydrates (stachyose, raffinose) lirioid monoterpenes (harpagoside, harpagide, procumbide), organic acids (ursolic, caffeic, cinnamic, chlorogenic), polyphenols (kaempferol, luteolin), phenylethanol derivatives (acteoside).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Roots.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 2,000 mg (standardized to 8% harpagoside).

POSSIBLE THERAPEUTIC APPLICATIONS

Inflammation; osteoarthritis.

COMMENTS

Devil's claw may improve digestion for people who do not produce enough stomach acid. As with osteoarthritis, the herb may help with rheumatoid arthritis.

CAUTIONS

Avoid if pregnant. Consult with your health practitioner if you have heart problems or are taking antihypertensive or blood thinning drugs, or have stomach or duodenal ulcers.

Dimethylaminoethanol

(DMAE; Deanol; Deaner)

DESCRIPTION/FUNCTION

DMAE is a precursor to choline, which is a precursor to the neurotransmitter, acetylcholine. Small amounts of DMAE are naturally present in anchovies and sardines.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Anchovies, sardines, and nutritional supplements.

MAINTENANCE/THERAPEUTIC RANGE

100 mg to 3,000 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Aging skin (topical).

COMMENTS

Most research on DMAE shows that it is ineffective, or even has negative properties.

CAUTIONS

Avoid if you have depression, schizophrenia, or seizures. DMAE may inhibit the conversion of choline to betaine. Betaine can reduce the production of homocysteine, an independent risk factor for atherosclerosis. Therefore, people who have elevated homocysteine levels should avoid DMAE.

Dimethylglycine

(DMG)

DESCRIPTION/FUNCTION

DMG is a molecule containing two methyl groups and glycine, the simplest amino acid. DMG is formed when betaine (TMG) donates a methyl group to homocysteine, which is then converted to the amino acid, methionine.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Nutritional supplements.

MAINTENANCE/THERAPEUTIC RANGE

100 mg to 200 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Immune function.

COMMENTS

People are using DMG to treat autism, attention deficit disorder, and seizures, but there is little research; mostly anecdotal reports. Also, most research does not support claims that DMG improves athletic performance.

CAUTIONS

Avoid if pregnant.

Dong Quai

(Angelica sinensis)

DESCRIPTION/FUNCTION

Dong quai (often spelled Tang kuei) is a member of the parsley family. It is native to the mountainous regions of China, Japan, and Korea. It has been used in Chinese medicine for more than 2,000 years. Active ingredients include coumarins (bergapten, imperatorin, osthol, psoralen), organic acids (angelic, ferulic, lactones, polysaccharides, sterols (beta-sitosterol, stigmaterol), volatile oils (ligustilide, cadinene, carvacrol, safrole isosafrol).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Roots.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 4,000 mg (standardized to 1% ligustilide).

POSSIBLE THERAPEUTIC APPLICATIONS

Menopause; premenstrual syndrome.

COMMENTS

There is contradictory research on whether or not dong quai has estrogenic effects. Also, there is concern that some of its active ingredients have carcinogenic properties. There is not a lot of research supporting dong quai's use. However, in traditional Chinese medicine (TCM), herbs are rarely used alone; usually they are combined with many other herbs.

CAUTIONS

Avoid if pregnant. Consult with your health practitioner if you are taking a blood thinning drug, or if you have a hormone-sensitive cancer (breast, ovarian, uterine). Dong quai may also cause photosensitivity, so use sunscreens when exposed to the sun.

Echinacea

(E. angustifolia; E. pallida; E. purpurea)

DESCRIPTION/FUNCTION

Echinacea species are native to the United States. They were traditionally used by Native Americans for many health problems. A partial list of active ingredients include alkaloids (betaine, tussilagine), polysaccharides (arabinorhamnogalactans, echinacin, inulin), phenolic acids (cichoric, chlorogenic, echinacoside, verbascoside, caffeic, cynarin), polyphenols (rutoside, luteolin, kaempferol, quercetin, apigenin, isorhamnetin), terpenes (humulene, echinadiole), volatile oils (borneol, bornylacetate, germacrene).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Leaves and roots.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 2,000 mg (standardized to 4% echinacosides and/or 15% total polysaccharides).

POSSIBLE THERAPEUTIC APPLICATIONS

Common cold; flu; immune function; inflammation; wound healing.

COMMENTS

Echinacea supplements may contain single preparations of the root or leaf of one species, or combinations of species and their leaves and/or roots. Echinacea should be taken at the first sign of infection, and should not be used prophylactically (preventively). Some health practitioners recommend echinacea be used for no more than eight weeks, followed by a one week "drug holiday". Recent studies have had disappointing results when echinacea was used to treat or prevent colds.

CAUTIONS

Do not take if you have an autoimmune disorder, including HIV/AIDS or multiple sclerosis.

Elderberry

(Sambucus nigra)

DESCRIPTION/FUNCTION

The elderberry used therapeutically comes from the European Elder. It is a member of the honeysuckle family. All parts of the plant have been used therapeutically, but it is the fruit that is primarily used. The fruit has been used to make jellies, pie, and wine, and also dyes, cosmetics, and home remedies. The berry's active ingredients include anthocyan glycosides, cyanogenic glycosides (sambunigrin), caffeic acid derivatives (chlorogenic acid), flavonoids (rutin, quercitrin, hyperoside, astragaln, nicotoflorin), lectins, tannins.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Fruit.

MAINTENANCE/THERAPEUTIC RANGE

400 mg to 1,200 mg (standardized to 5% bioflavonoids or 30% anthocyanidins).

POSSIBLE THERAPEUTIC APPLICATIONS

Common cold; flu.

COMMENTS

Elderberry extract inhibits hemagglutinin activity and replication of several human influenza viruses. (Hemagglutinin is a blood cell clumping agent, such as a virus or an antibody, that causes red blood cells to clump together. It enables the virus to bind to and invade cells.) Sambucol is an elderberry syrup that is available for adults and children. Elderberries also have antioxidant properties.

CAUTIONS

Use only the ripe, purple berries from the European Elder. The unripe red berries can be mildly toxic.

Ellagic Acid

DESCRIPTION/FUNCTION

Ellagic acid is an organic acid classified as a phenolic acid. Phenolic acids include hydroxycinnamic acids (caffeic, ferulic, chlorogenic, neochlorogenic, curcumin) and hydroxybenzoic acids (ellagic, gallic). Dietary sources of phenolic acids include apple, blackberry, blueberry, cherry, coffee bean, grapefruit, grapes, pomegranate, raspberry, strawberry, walnut.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Blackberries, raspberries, strawberries, walnuts.

MAINTENANCE/THERAPEUTIC RANGE

500 mcg to 1,000 mcg.

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer.

COMMENTS

Ellagic acid has antioxidant, anti-inflammatory, and anticancer properties. More reasons why eating berries is so healthful.

CAUTIONS

None known.

Fenugreek

(Trigonella foenum-graecum)

DESCRIPTION/FUNCTION

Fenugreek is native to the region bounded by southeastern Europe and western Asia. It is cultivated mostly in southern France, Turkey, northern Africa, India, and China. Fenugreek seeds have a taste and odor similar to maple syrup. Active ingredients include alkaloids (trigonelline), fenugreekine, flavonoids (isorientin, isovitexin, orientin, saponaretin, vitexin), mucilages, proteinase inhibitors, steroid saponins (trigofenosides, diosgenin, yamogenin, gitogenin, smilagenin), steroid saponin-peptide ester (foenugraecin), sterols, volatile oils.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Seeds.

MAINTENANCE/THERAPEUTIC RANGE

1 g to 10 g.

POSSIBLE THERAPEUTIC APPLICATIONS

Diabetes; high triglycerides.

COMMENTS

Fenugreek seeds are helpful for both types of diabetes (type 1 and type 2). There is also evidence that fenugreek can lower cholesterol levels. Fenugreek may decrease kidney stone formation.

CAUTIONS

Avoid if pregnant (can cause uterine contractions). Consult with your health practitioner if you are taking medication for diabetes (you may have to make dosage adjustments) or blood thinning drugs. Be careful if you have low blood sugar (hypoglycemia).

Feverfew

(Tanacetum parthenium; Chrysanthemum parthenium)

DESCRIPTION/FUNCTION

Feverfew is native to southeastern Europe and southwestern Asia. Its leaves have a strong fragrance, and it was traditionally planted around houses to purify the air and repel insects. Active ingredients include flavonoids (apigenin, luteolin, tanetin), sesquiterpene lactones (parthenolide, costunolid, reynosin, canin, artecamin), volatile oils (camphor, borneol, linalool).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Leaves.

MAINTENANCE/THERAPEUTIC RANGE

250 mg to 500 mg (standardized to 0.2% to 0.4% parthenolide).

POSSIBLE THERAPEUTIC APPLICATIONS

Headache (migraine); inflammation.

COMMENTS

It may take a month or two for feverfew to take effect in reducing migraines. Some health practitioners recommend periodically going off feverfew for a few days and then resuming its use. Some people may get rebound headaches if they suddenly stop taking feverfew.

CAUTIONS

Avoid if pregnant. Consult with your health practitioner if you are taking a blood thinning drug.

Flaxseed

(Linum usitatissimum)

DESCRIPTION/FUNCTION

Flax is found throughout the world. The seeds are used as a source of oil. Nonedible oil is usually called linseed oil. It is used in the manufacture of paints, varnishes, linoleum, oilcloth, printing inks, soaps, and many other products. Flaxseed oil is purer and is meant for internal consumption. Active ingredients include cyanogenic glycosides (linustatin, neolinustatin), fatty acids (alpha-linolenic, linoleic, oleic), lignans (matairesinol, secoisolariciresinol), mucilages (arabinoxylans, galactans, rhamnogalacturonans).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Flaxseed oil, whole or ground seeds.

MAINTENANCE/THERAPEUTIC RANGE

Seeds: 1 tbsp to 3 tbsp (10g - 30g). Oil: 1 tbsp to 3 tbsp.

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer (breast, colon); constipation (whole seeds); high cholesterol (mostly ground seeds); high triglycerides; inflammation; lupus (ground seeds); menopause (ground seeds).

COMMENTS

Ground flax seeds and flaxseed oil oxidize (turn rancid) very quickly. The seeds should be ground in small quantities and kept refrigerated. Drink plenty of fluid when the ground seeds are consumed (they swell considerably). The whole seeds can help with constipation without adding many calories. The oil should also be kept refrigerated and consumed within several weeks. Flax is very high in the omega-3 fatty acid, alpha-linolenic acid (ALA). About 10% of this 18-carbon fatty acid can be converted to EPA (20-carbon) and DHA (22-carbon). Most of flax's benefits come from its ALA and lignan content. (Plant lignans are phytoestrogens that can block estrogen receptors in the body.)

CAUTIONS

Consult with your health practitioner if you are taking a blood thinning drug, or are diabetic. Taking ground flax seeds with medications may slow the absorption of the drugs.

Folic Acid

(folate; folacin)

DESCRIPTION/FUNCTION

Folic acid is classified as a member of the B-vitamins. It appears to be essential for biosynthesis of nucleic acids; essential for normal maturation of red blood cells; functions as the coenzyme, tetrahydrofolic acid; used in one-carbon transfer reactions.

DRI (RDA or AI for Adults)

Adults: 400 mcg.

Pregnancy: 600 mcg. Lactation: 500 mcg. (Prevents some birth defects.)

MAJOR SOURCES

Green leafy vegetables, liver, brewer's yeast, legumes.

MAINTENANCE/THERAPEUTIC RANGE

200 mcg to 1,000 mcg. (At high doses, balance with extra vitamin B12.)

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer (breast, cervical, colorectal, pancreatic); coronary heart disease; depression; high homocysteine; infertility (male); memory loss; ulcerative colitis.

COMMENTS

Folic acid may work with vitamins B6 and B12 in reducing homocysteine, a risk factor for heart disease. When taken during pregnancy, it reduces neural tube birth defects.

CAUTIONS

Consult with your health practitioner if taking prescription drugs. There can be a variety of interactions between folic acid and many medications.

Gamma Aminobutyric Acid

(GABA)

DESCRIPTION/FUNCTION

GABA is a neurotransmitter, which is a chemical made by neurons (nerve cells). Neurons send out neurotransmitters as chemical signals to activate or inhibit the function of neighboring cells. GABA is an inhibitory neurotransmitter. It belongs to the neurotransmitter family that is composed of amino acids. GABA, and its precursor, glutamic acid, are the most abundant neurotransmitters within the central nervous system, including the cerebral cortex, which is responsible for higher brain functions, including thought and interpreting sensations.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Made in the body and supplements.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 3,000 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Anxiety; epilepsy; insomnia.

COMMENTS

St. John's Wort apparently inhibits the reuptake of GABA, which should result in an increase of GABA levels. Valerian root inhibits the breakdown of GABA, also increasing its level. Inositol can act as a cofactor with GABA. GABA does not easily pass across the blood-brain barrier. Gabapentin, a slightly modified form of GABA, is a prescription drug that goes into the brain more easily.

CAUTIONS

Excessive levels of GABA may impair learning and memory.

Gamma Oryzanol

DESCRIPTION/FUNCTION

Gamma oryzanol is produced primarily from rice bran oil, although it is also present in other cereal grain oils. Active ingredients include ferulic acid esters (triterpene alcohols) and phytosterols (cycloartenol).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Rice bran oil.

MAINTENANCE/THERAPEUTIC RANGE

200 mg to 300 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

High cholesterol; high triglycerides; menopause.

COMMENTS

Gamma oryzanol has been used by body builders and athletes in the belief that it would enhance their performance through anabolic properties. However, there is evidence that it may actually have anti-anabolic activity.

CAUTIONS

Consult with your health practitioner if you have hypothyroidism, since gamma oryzanol can reduce TSH (thyroid stimulating hormone) levels.

Gamma Tocopherol

DESCRIPTION/FUNCTION

The vitamin E family contains eight members, in two groups: tocopherols (alpha, beta, gamma, delta) and tocotrienols (alpha, beta, gamma, delta). Higher amounts of gamma tocopherol are present in unfortified food than alpha tocopherol.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Vegetable oils (soy, corn, canola, sesame) and nuts (pistachio, pecan).

MAINTENANCE/THERAPEUTIC RANGE

100 mg to 400 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer (colon, prostate); coronary heart disease; inflammation.

COMMENTS

There is concern over using alpha-only supplements because the alpha form is preferentially absorbed over the other tocopherols. High amounts of alpha-tocopherol (400 IU/d) can reduce levels of gamma- and delta-tocopherols. This may be the reason for disappointing results in some studies using only alpha-tocopherol; subjects weren't getting full benefit because their levels of gamma- and delta-tocopherols were lowered. This may account for the disparity between epidemiological studies of diets high in tocopherols versus studies using alpha-only supplements. Alpha-Tocopherol is a more potent lipophilic chain-breaking antioxidant, but gamma-tocopherol is better at neutralizing reactive nitrogen oxide species (RNOS). Excess RNOS (e.g., peroxynitrite and nitrogen dioxide) is associated with chronic inflammation-related diseases, including cancer and atherosclerosis.

CAUTIONS

Consult with your health practitioner if you are taking a blood thinning drug.

Garcinia Cambogia / Brindle Berry

(Garcinia cambogia)

DESCRIPTION/FUNCTION

Garcinia cambogia is the scientific name for the brindle berry. It is a fruit, shaped like a pumpkin, but is about the size of an orange. It is native to south Asia. The main active ingredient in brindle berry is (-)-hydroxycitric acid (HCA), which is found in its rind. HCA inhibits ATP citrate lyase, an enzyme which is involved in the conversion of citrate into acetyl-coenzyme A (acetyl-CoA). Acetyl CoA is used in the synthesis of fat from excess calories, primarily from carbohydrates.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Rind of the brindle berry.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 2,000 mg (standardized to 50% HCA).

POSSIBLE THERAPEUTIC APPLICATIONS

Obesity.

COMMENTS

The research supporting HCA and obesity is limited, but it may help. If taken before meals, HCA may also reduce the appetite. HCA supplements often contain added chromium, since this trace mineral is involved in blood sugar regulation.

CAUTIONS

None known.

Garlic

(*Allium sativum*)

DESCRIPTION/FUNCTION

Garlic, related to onion (*Allium cepa*), is classified as belonging to the Amaryllidaceae family (amaryllis) or to the Liliaceae family (lily). Garlic has been used for thousands of years, both as a flavoring and as a medicinal agent. It probably originated in central Asia. Active ingredients include cysteine derivatives (S-allylmercaptocysteine, S-methyl-cysteine, alliin, S-allyl-L-cysteine), organic acids (caffeic, chlorogenic, phytic, succinic), polyphenols (kaempferol, quercetin, rutin, allixin), sulfur compounds (ajoene, allicin, allyl disulfides, allyl methyltrisulfide, allyl propyl disulfide, diallyl compounds, glucosinolates).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Bulbs.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 3,000 mg (depending on the form).

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer (colorectal, gastric, prostate); common cold; coronary heart disease; high blood pressure; high cholesterol; high triglycerides; immune function; infection (bacterial, fungal, parasitic, viral); prostate problems.

COMMENTS

One major active component of garlic is allicin. It is produced when garlic is crushed and alliin is exposed to the enzyme, allinase. There are supplements that provide allicin potential. Aged garlic does not produce allicin, but does contain other beneficial ingredients (e.g., S-allyl-L-cysteine). Garlic oil products are not very effective. Overly cooked garlic also loses many of its beneficial properties.

CAUTIONS

Consult with your health practitioner if you have a bleeding disorder, are taking a blood thinning drug, or many other medications.

Ginger

(Zingiber officinale)

DESCRIPTION/FUNCTION

Ginger root (rhizome) is often used as a spice in many parts of the world, especially Asia. Active ingredients include aryl alkanes (gingerols, shogaols), gingerdiols, and volatile oils (zingiberone, bisabolene, camphene, geraniol, linalool, borneol).

DRI (RDA or AI for Adults)

None.

MAJOR SOURCES

Rhizome.

MAINTENANCE/THERAPEUTIC RANGE

100 mg to 1,000 mg (standardized to 5% to 10% gingerols or volatile oils).

POSSIBLE THERAPEUTIC APPLICATIONS

Coronary heart disease; headache (migraine); high cholesterol; inflammation; morning sickness; motion sickness; nausea; osteoarthritis; rheumatoid arthritis; vertigo.

COMMENTS

Ginger is beneficial for the GI tract, being particularly helpful with nausea. Ginger is used to treat indigestion and flatulence, and it has a broad range of action against intestinal parasites. Ginger also has antioxidant properties. Turmeric, another traditional spice, belongs to the ginger family.

CAUTIONS

Consult with your health practitioner if you have gallstones or are taking blood thinning drugs.

Ginkgo Biloba

(Ginkgo biloba)

DESCRIPTION/FUNCTION

Ginkgo is the oldest living tree species. It is native to China, Japan, and Korea, but is also found throughout Europe and North America. It is often used as an ornamental tree. Active ingredients include flavonoids, biflavonoides, and proanthocyanidins. Ginkgo leaves are the source used in supplements.

DRI (RDA or AI for Adults)

None.

MAJOR SOURCES

Leaves.

MAINTENANCE/THERAPEUTIC RANGE

50 mg to 300 mg (standardized to 24% ginkgoflavonglycosides and 6% terpenolactones).

POSSIBLE THERAPEUTIC APPLICATIONS

Anxiety; coronary heart disease; glaucoma; inflammation; macular degeneration; memory loss; poor circulation; premenstrual syndrome; Raynaud's disease; retinopathy; tinnitus; vertigo.

COMMENTS

Ginkgo has antioxidant properties. Ginkgo biloba extract (GBE) is among the leading prescription medicines in both Germany and France, and worldwide, millions of prescriptions are written for it annually.

CAUTIONS

Consult with your health practitioner if you are taking any medication, especially blood thinning/anticoagulant drugs, such as aspirin, clopidogrel (Plavix), dalteparin (Fragmin), enoxaparin (Lovenox), heparin, indomethacin (Indocin), ticlopidine (Ticlid), and warfarin (Coumadin). Avoid ginkgo seeds; they contain ginkgotoxin, which can cause seizures and death.

Ginseng: Asian & American

(*Panax ginseng*; *Panax quinquefolius*)

DESCRIPTION/FUNCTION

Ginseng is native to China (*P. ginseng*) and North America (*P. quinquefolius*), and is also cultivated in Japan and Korea. It has a long history of use, especially in China. Asian and American ginseng have very similar properties, but Siberian ginseng belongs to a different genus and differs in ingredients and properties. Active ingredients include triterpene saponins, aglycones (various ginsenosides), polysaccharides, polyynes (falcarinol, falcarintriol).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Roots.

MAINTENANCE/THERAPEUTIC RANGE

400 mg to 2,000 mg (standardized to 5% to 30% ginsenosides).
Use low range for long-term use and high range for short-term use.

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer (gastric, lung, liver, skin; avoid if hormone-sensitive cancer); common cold; diabetes; erectile dysfunction; flu; immune function; infertility (male); memory loss; menopause.

COMMENTS

Ginseng is often classified by the age of the root, the country it came from, and how it was processed (natural white or steam cured red; whole, powdered, or liquid extract). Ginseng has been classified as an adaptogen, helping the body to resist stress, and having a general, normalizing effect. Herbalists often recommend that the use of ginseng should be cycled on and off; that is, after one or two months of use, not taking it for a week or two.

CAUTIONS

Avoid if pregnant. Consult with your health practitioner if you are a diabetic, schizophrenic, have heart problems, hormone sensitive cancer (breast, ovarian, uterine), are taking a blood thinning drug, or are taking other medications.

Ginseng: Siberian

(Eleutherococcus senticosus)

DESCRIPTION/FUNCTION

Siberian ginseng (often called eleuthero ginseng) is native to Siberia, northern China, Japan, and Korea. Its recorded use dates back 2,000 years. Siberian ginseng belongs to the same family (*Araliaceae*) as do American and Asian ginseng, but to a different genus. Its appearance is different, too. Siberian ginseng can grow to a large bush, whereas true ginseng is a small plant. Active ingredients include coumarin (isofraxidin), lignans (sesamin, eleutheroside D), organic acids (caffeic, chlorogenic), polysaccharides (eleutherane A-G), steroids (beta-sitosterol), steroid glycosides (eleutheroside A), triterpene saponins (eleutheroside I, K, L, M).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Roots and rhizome.

MAINTENANCE/THERAPEUTIC RANGE

300 mg to 600 mg (standardized to 1% eleutheroside E, or to a combination of eleutherosides).

POSSIBLE THERAPEUTIC APPLICATIONS

Common cold; flu; herpes (type 2; usually genital); immune function; memory loss.

COMMENTS

Like the true ginsengs, Siberian ginseng is considered to have adaptogenic properties. Research also shows that it can reduce fatigue and improve athletic performance.

CAUTIONS

Consult with your health practitioner if you are diabetic, have heart problems, hormone sensitive cancer (breast, ovarian, uterine), are taking a blood thinning drug, or other medications.

Glucomannan

(Amorphophallus konjac)

DESCRIPTION/FUNCTION

Glucomannan (also called konjac) is derived from several species of *Amorphophallus*, which are related to the philodendron plant. It is a soluble fiber composed of linkages of D-glucose and D-mannose. The plants are found in China and Japan, and have a long history of use as both food and medicine.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Processed konjac tuber flour.

MAINTENANCE/THERAPEUTIC RANGE

1 g to 4 g, taken with plenty of water.

POSSIBLE THERAPEUTIC APPLICATIONS

Constipation; diabetes; high cholesterol; high triglycerides; obesity.

COMMENTS

Glucomannan should be taken one hour before each meal, with plenty of water.

CAUTIONS

Do not take if you have an intestinal blockage. Consult with your health practitioner if you have diabetes, since you may need to adjust medication.

Glucosamine

DESCRIPTION/FUNCTION

Glucosamine and chondroitin sulfate are found in connective tissue (cartilage, tendons, bone, skin, arterial walls). Glucosamine is an amino sugar of glucose and glutamine. It belongs to a family of polysaccharides called glycosaminoglycans (formerly called mucopolysaccharides). These in turn are combined with protein to form proteoglycans.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Marine exoskeletons of shellfish (usually, but synthetic is also available).

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 1,500 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Inflammatory bowel disease (NAG); inflammation; osteoarthritis.

COMMENTS

Glucosamine is commonly found in three forms: glucosamine hydrochloride (glucosamine HCl), glucosamine sulfate (GS), and N-acetyl-glucosamine (NAG). The HCl and sulfate forms are absorbed better, but NAG stays longer in the body. Supplements often combine glucosamine and chondroitin.

CAUTIONS

Consult with your health practitioner if you are taking a blood thinning drug, have asthma, or if you are diabetic. Pure supplements should not be a problem, but still be careful if you are allergic to shellfish.

Glutamine

(L-Glutamine)

DESCRIPTION/FUNCTION

Glutamine is classified as a conditionally essential amino acid. It can become essential during periods of stress. It is especially important for the intestines and immune system. The body combines ammonia (high levels are toxic) with glutamate (glutamic acid) to form glutamine, and carries ammonia out of cells to the liver, kidneys, and intestines.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Protein foods and produced in the body (primarily muscle and lungs).

MAINTENANCE/THERAPEUTIC RANGE

1 g to 30 g.

POSSIBLE THERAPEUTIC APPLICATIONS

Alcoholism; HIV/AIDS; immune function; irritable bowel syndrome; ulcerative colitis; wound healing.

COMMENTS

Glutamine can reduce the damage to the intestines caused by chemotherapy. Research shows that glutamine protects athletes from increased infections (lowered immunity) after strenuous exercise. Glutamic acid (from glutamine) combines with cysteine and glycine to form glutathione.

CAUTIONS

Consult with your health practitioner if you have seizures, liver problems, or have manic episodes.

Glutathione

DESCRIPTION/FUNCTION

Glutathione is a tripeptide consisting of three amino acids: cysteine, glutamic acid, and glycine. It is a cofactor for several enzymes, and is involved in the maintenance of SH bonds (sulfur bonds) in proteins, and in membrane amino acid transport. The liver uses it to metabolize carcinogens and toxins.

DRI (RDA or AI for Adults)

None.

MAJOR SOURCES

Produced in the body and nutritional supplements.

MAINTENANCE/THERAPEUTIC RANGE

50 mg to 500 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer; HIV/AIDS; infertility (male).

COMMENTS

N-Acetyl cysteine (NAC) is often used as its precursor, since there is some question on how well glutathione is absorbed. Research has shown that it is absorbed by some animals (rats and guinea pigs), but there is less evidence on its absorption rates by humans. Regardless of absorption into the bloodstream, the enterocytes (cells lining the intestines) can use glutathione locally. Glutathione can recycle (reduce) oxidized vitamin C.

CAUTIONS

None known.

Glycine

DESCRIPTION/FUNCTION

Glycine is a nonessential amino acid, and it has the simplest structure of all the amino acids. Glycine is used for the synthesis of various proteins, nucleic acids, and purines, glutathione, creatine, hemoglobin (heme-porphyrins), sarcosine, and a bile salt (glycocholate). It can be converted into serine. It is a gluconeogenic amino acid, meaning that it can be converted into glucose. It also acts as an inhibitory neurotransmitter.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Protein foods.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 5,000 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Stroke (ischemic, taken sublingually).

COMMENTS

When taken with other medications, glycine can reduce the negative symptoms of schizophrenia. When combined with two other amino acids (alanine and glutamic acid), it may help with benign prostatic hyperplasia (BPH), according to research done 30 to 40 years ago. Some research shows that it may inhibit the growth of some cancers. Glycine has a sweet taste and is easily added to food.

CAUTIONS

None known, but large doses can cause fatigue.

Goldenseal

(Hydrastis canadensis)

DESCRIPTION/FUNCTION

Goldenseal is native to the forests of eastern Canada and the United States. It was used by Native Americans for skin problems and as a yellow dye. Active ingredients include alkaloids (berberine, hydrastine, canadine, canadaline).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Rhizome or roots.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 2,000 mg (standardized to 5% berberine or hydrastine, or 10% total alkaloids).

POSSIBLE THERAPEUTIC APPLICATIONS

Diarrhea; immune function; parasites; urinary tract infection; yeast infection.

COMMENTS

The active ingredients in goldenseal do not absorb well, but a liquid, alcohol extract may increase absorption. The alkaloids in goldenseal can kill a variety of pathogenic organisms (bacteria, fungi, parasites). Take goldenseal (plus garlic and a probiotic) on trips where there is a risk of getting traveler's diarrhea. Long-term use of goldenseal can reduce the population of the beneficial intestinal bacteria. Goldenseal does not fool urine tests for the use of illegal drugs.

CAUTIONS

Avoid if pregnant. Consult with your health practitioner if you have heart or liver problems, or are taking medications.

Gotu Kola

(Centella asiatica; Hydrocotyle asiatica)

DESCRIPTION/FUNCTION

Gotu kola is native to Africa, Australia, China, India, Indonesia, Madagascar, southern U.S., South America, and the South Pacific. It is a member of the parsley (*Umbelliferae*) family. Active ingredients include phytosterols (campesterol, sitosterol, stigmasterol), polyphenols (quercetin, kaempferol), triterpene acids (asiatic, madecassic, terminolic), triterpene saponins (asiaticoside).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Leaves and stems.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 1,000 mg (standardized to 10% triterpene acids).

POSSIBLE THERAPEUTIC APPLICATIONS

Anxiety; inflammation; memory loss; poor circulation; psoriasis (topical); ulcers; varicose veins; wound healing (topical).

COMMENTS

Gotu kola does not contain caffeine, and it is not a stimulant. In fact, in high enough dosages, some people may experience drowsiness. Gotu kola's healing properties may be due to stimulation of connective tissue synthesis.

CAUTIONS

Avoid if pregnant. Consult with your health practitioner if you have diabetes, or high cholesterol or triglycerides.

Grape Seed

(Vitis vinifera)

DESCRIPTION/FUNCTION

Grapes are native to southern Europe and western Asia, but are cultivated in many temperate regions around the world. Grape Seed Extract (GSE), along with a pine bark extract (pycnogenols), contains oligomer proanthocyanidins (OPCs), sometimes called procyanidolic oligomers. Besides OPCs, grape seeds contain catechins, ellagic acid, fruit acids (citric, malic, oxalic, succinic, tartaric), and resveratrol.

DRI (RDA or AI for Adults)

None.

MAJOR SOURCES

Seeds from various grapes.

MAINTENANCE/THERAPEUTIC RANGE

50 mg to 400 mg (standardized to 95% OPCs, although there is controversy on the validity of this reference).

POSSIBLE THERAPEUTIC APPLICATIONS

Bruising; cancer; coronary heart disease; liver support; inflammation; retinopathy; varicose veins.

COMMENTS

GSE has antioxidant properties, and works with vitamin C in connective tissue maintenance. OPCs have been researched since the 1950s by Jack Masquelier, Ph.D., Professor Emeritus, University of Bordeaux, France.

CAUTIONS

Consult with your health practitioner if you are taking a blood thinning drug.

Grape Skin

(Vitis vinifera)

DESCRIPTION/FUNCTION

Purple and red grape skin extract contains a mix of substances, some of which are found in grape seeds and some in red wine. These substances include nonbioflavonoid polyphenols (derivatives of cinnamic and benzoic acid) and bioflavonoid polyphenols (quercetin, catechins, flavonols, and anthocyanidins). One of these ingredients, resveratrol, was found to have antiplatelet aggregating activity.

DRI (RDA or AI for Adults)

None.

MAJOR SOURCES

Skin from red and purple grapes.

MAINTENANCE/THERAPEUTIC RANGE

200 mg to 1,000 mg (standardized to 30% anthocyanins).

POSSIBLE THERAPEUTIC APPLICATIONS

Bruising; coronary heart disease.

COMMENTS

Red wine has gotten a lot of press, sometimes being called the "French Paradox." The reason for this is that, while Frenchmen have a high-fat diet, they have one-third as many heart attacks as American men, although they have similar high cholesterol and blood pressure levels as their American counterparts. The main reason for this effect may be the polyphenols from the grape skin, not the alcohol content of the wine.

CAUTIONS

None known.

Green Tea

(*Camellia sinensis*)

DESCRIPTION/FUNCTION

Tea drinking has a long history, going back about 5,000 years. *Camellia sinensis*, as a tea, is available as white, green, oolong, and black. Tea goes from white to black depending on the amount of processing it goes through (steaming and fermentation). Asians are noted for their consumption of green tea (about 3 cups daily). Most research has been done on green tea, but all forms have beneficial properties. Green tea contains many polyphenols, flavonoids (quercetin), purine alkaloids, triterpene saponins, chlorogenic acid, and catechins, especially (-)epigallocatechin gallate (EGCG).

DRI (RDA or AI for Adults)

None.

MAJOR SOURCES

Leaves.

MAINTENANCE/THERAPEUTIC RANGE

100 mg to 1,000 mg (standardized to at least 50% polyphenols or EGCG). About 1 to 8 cups of tea, depending on how it is brewed.

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer (bladder, breast, gastric, ovarian); coronary heart disease; gum disease (as tea); high cholesterol; high triglycerides; inflammation; obesity; Parkinson's disease.

COMMENTS

Green tea catechins are synergistic with vitamins E and C. Depending on how it is tested, EGCG is 20 to 200 times more powerful than vitamin E in neutralizing pro-oxidants and free radicals.

CAUTIONS

None significant. Unless decaffeinated, may contain about 6% caffeine.

Guar Gum

(Cyamopsis tetragonoloba)

DESCRIPTION/FUNCTION

Guar is a member of the legume (*Leguminosae*) family. The seeds are processed to produce the gum, which is a water-soluble polysaccharide called galactomannan. Guar gum acts as a dietary fiber, swelling when added to water. It is used in the food industry as a natural stabilizer and thickener.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Seeds.

MAINTENANCE/THERAPEUTIC RANGE

5 g to 15 g (take with at least 8 ounces of water each time).

POSSIBLE THERAPEUTIC APPLICATIONS

Constipation; diabetes; diarrhea; high cholesterol; high triglycerides; irritable bowel syndrome; obesity.

COMMENTS

Start with a low dose and increase gradually to avoid GI side effects, such as intestinal gas. Always take with sufficient water, about 30 minutes before meals. If using the powdered form, drink quickly after adding it to water, since it will form a gel. In addition to guar gum, fiber formulas may also contain pectin and psyllium.

CAUTIONS

Do not take if you have an intestinal obstruction. If taken with meals, guar gum may interfere with nutrient absorption.

Guggulipid

(Commiphora mukul; Commiphora wightii)

DESCRIPTION/FUNCTION

Guggulipid comes from the mukul myrrh tree, which is native to India. It has a long history of use in Ayurvedic medicine. Incisions are made in the tree bark, and the resin is collected. Active ingredients include guggulsterones, terpenes, volatile oils (M-cresol, eugenol, heerabolone).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Resin (gum guggul).

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 2,000 mg (standardized to 5% guggulsterones).

POSSIBLE THERAPEUTIC APPLICATIONS

Acne; high cholesterol; inflammation; obesity; osteoarthritis.

COMMENTS

Most research on guggulipid was done in India. There is some question about it being more effective for Indians than Westerners (genetics, diet, lifestyle?). Guggulipid may have antioxidant properties. It may lower C-reactive protein, an independent risk factor for heart disease. Guggulipid can increase thyroid hormone (T3).

CAUTIONS

Avoid if pregnant. Consult with your health practitioner if you are taking a blood thinning drug, or thyroid or heart medication.

Gymnema Sylvestre

(Gymnema sylvestre)

DESCRIPTION/FUNCTION

Gymnema is native to the tropical forests of central and southern India. It has been used in India to treat diabetes for at least two thousand years. When the leaves are chewed, it reduces the tongue's sensitivity to detect sweetness. The active ingredients are primarily a group of gymnemic acids (I to IX) and a peptide (gurmarin).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Leaves.

MAINTENANCE/THERAPEUTIC RANGE

400 mg to 600 mg (standardized to 25% gymnemic acids).

POSSIBLE THERAPEUTIC APPLICATIONS

Diabetes.

COMMENTS

Gymnema may work in several ways. It may reduce absorption of glucose, stimulate pancreatic beta cells, increase insulin levels, or decrease insulin resistance. It may take a year or two of use for gymnema to maximize its effects.

CAUTIONS

Consult with your health practitioner if you have diabetes. You may need to adjust your diabetes medication.

Hawthorn

(*Crataegus* sp.: *C. laevigata*, *C. monogyna*, *C. oxyacantha*)

DESCRIPTION/FUNCTION

Hawthorn belongs to the rose family (*Rosaceae*). There are several hundred species, found in the temperate regions of North America and Europe. Active ingredients include polyphenols (hyperoside, oligomeric proanthocyanidins, quercetin, rutin, vitexin), triterpenes (oleanolic acid, ursolic acid, crataegolic acid).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Flowers, leaves, and fruit (berries).

MAINTENANCE/THERAPEUTIC RANGE

200 mg to 1,000 mg (standardized to 2%/5% crataegolic acid/glycosides, or 2% polyphenols, or 20% oligomeric proanthocyanidins, or 2% to 3% vitexin).

POSSIBLE THERAPEUTIC APPLICATIONS

Angina pectoris; congestive heart failure; coronary heart disease; high blood pressure.

COMMENTS

Hawthorn increases coronary blood flow. It may take two to four months to realize hawthorn's maximum benefits. Several of hawthorn's ingredients have antioxidant properties.

CAUTIONS

Avoid if pregnant (may stimulate the uterus). Consult with your health practitioner if you are taking any kind of medication for heart problems, since adjustments will have to be made.

Holy Basil

(Ocimum sanctum)

DESCRIPTION/FUNCTION

Holy basil, commonly called tulsi, is native to India. It is a member of the mint family. It has a peppery taste, and is used as a spice in cooking. Holy basil has a long history of use in Ayurvedic medicine. Active ingredients include terpenes (carvacrol, caryophyllene, eugenol, eugenal, limatrol, methyl chavicol, oleanoic, ursolic acid), phenolic acids (gallic, protocatechuic, vanillic, caffeic, chlorogenic), polyphenols (apigenin, luteolin, orientin, molludustin).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Leaves, seeds, and roots.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 1,500 mg (standardized to eugenols or triterpenoids).

POSSIBLE THERAPEUTIC APPLICATIONS

Diabetes.

COMMENTS

Animal research shows that holy basil has a variety of medicinal properties, and may be helpful in lowering cholesterol levels, fighting infections, healing gastric ulcers, lowering blood pressure, reducing stress responses, neutralizing free radicals, reducing inflammation, and helping with pain. Some holy basil products use the powdered leaves or roots, and some use oil extracted from the seeds.

CAUTIONS

Consult with your health practitioner if you are using a blood thinning drug.

Hoodia

(Hoodia gordonii)

DESCRIPTION/FUNCTION

Hoodia is a succulent (cactus-like) plant that is native to the deserts of Angola, Botswana, Namibia, and South Africa. It has been used by the San bushmen of the Kalahari for hundreds of years. Hoodia contains a mixture of active ingredients called P57. This mixture apparently acts on glucose-sensing cells in the hypothalamus, suppressing hunger signals.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Stems.

MAINTENANCE/THERAPEUTIC RANGE

50 mg to 200 mg (20:1 extract).

POSSIBLE THERAPEUTIC APPLICATIONS

Obesity.

COMMENTS

Little research has been done on hoodia. Some informal studies, however, show significant reductions in caloric intake. Apparently the pharmaceutical company, Pfizer, tried to synthesize the active ingredients (P57), but wasn't successful. Unilever is now researching it. Many hoodia products are appearing in the market, but not all contain the active ingredients. Hoodia should be taken one hour before meals. Besides appetite reduction, it may elevate mood.

CAUTIONS

None known.

Hops

(*Humulus lupulus*)

DESCRIPTION/FUNCTION

The common hop is native to Eurasia. A variety of it is native to temperate North America. Hops belong to the cannabis (*Cannabaceae*) family. Both kinds are used in making beer. Active ingredients include acylphloroglucinols, bitter acids (humulone, lupulone), flavonoids (xanthohumole), phytoestrogen (8-prenylnaringenin), volatile oils (myrcene, humulene), resins, phenolic acids (ferulic, caffeic, chlorogenic), tannins.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Flowers (female hop cones).

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 3,000 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Anxiety; insomnia.

COMMENTS

For insomnia, hops are often combined with other herbs, including catnip, chamomile, passionflower, skullcap, and valerian.

CAUTIONS

Avoid during pregnancy because of its phytoestrogens. Do not drive while using hops. Do not combine with alcohol or depressants, or if you have a tendency toward depression.

Horny Goat Weed

(Epimedium grandiflorum)

DESCRIPTION/FUNCTION

Epimedium is found in the higher altitude regions of China and Japan. There are at least 15 epimedium species, but *Epimedium grandiflorum* is the species mostly used in products available in the U.S. In Asia, epimedium has been used for many centuries to improve sexual performance and desire. Active ingredients include alkaloids (magnaflorine), flavonoids, glycosides, phenolic acids (chlorogenic), polysaccharides, polyphenols (incariin).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Leaves.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 1,500 mg (standardized to 10% incariin).

POSSIBLE THERAPEUTIC APPLICATIONS

Erectile dysfunction.

COMMENTS

Little human research has been done on epimedium. It's effects include lowering blood pressure and improving blood flow.

CAUTIONS

Consult with your health practitioner if you are taking a blood thinning drug, or medication for high blood pressure.

Horse Chestnut

(Aesculus hippocastanum)

DESCRIPTION/FUNCTION

The common horse chestnut is a native of Europe, but was introduced to North America in colonial times. The fruits are leathery, three-valved capsules containing large, brown seeds. Active ingredients of the seeds include flavonoids (quercetin), oligosaccharides, polysaccharides, oligomeric proanthocyanidins, triterpene saponins (aescin or escin).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Mostly the seeds, but also the leaves.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 1,000 mg (standardized to 20% escin).

POSSIBLE THERAPEUTIC APPLICATIONS

Bruising; chronic venous insufficiency (edema); hemorrhoids; varicose veins.

COMMENTS

Horse chestnut extracts are also used topically. The extract shows some anti-inflammatory properties.

CAUTIONS

Avoid if pregnant. Do not consume raw seeds. Unprocessed seeds contain the toxic glycoside, aesculin (esculin). Consult with your health practitioner if you are taking a blood thinning drug.

Huperzine A

(Chinese Club Moss extract)

DESCRIPTION/FUNCTION

Huperzine A is an alkaloid derived from Chinese club moss (*Huperzia serrata*). It is an acetylcholinesterase inhibitor.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Club moss extract.

MAINTENANCE/THERAPEUTIC RANGE

50 mcg to 400 mcg.

POSSIBLE THERAPEUTIC APPLICATIONS

Memory loss.

COMMENTS

Acetylcholine is a neurotransmitter that allows electrical impulses to cross synapses between neurons (nerve cells). It can be neutralized by the enzyme, acetylcholinesterase. Huperzine A acts as an acetylcholinesterase inhibitor, thus helping to maintain higher acetylcholine levels. It also protects neurons from various toxic substances, including excessive levels of glutamic acid.

CAUTIONS

Consult with your health practitioner if you are taking cholinergic or anticholinergic medications.

Idebenone

DESCRIPTION/FUNCTION

Idebenone is classified as a synthetic quinone, and is structurally similar to CoQ10. Like CoQ10, it has antioxidant properties. Also like CoQ10, it is involved in ATP (adenosine triphosphate) function.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Nutritional supplements.

MAINTENANCE/THERAPEUTIC RANGE

50 mg to 300 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Memory loss.

COMMENTS

Idebenone may help to protect the CNS (central nervous system) from free radical-caused damage. It also seems to stimulate NGF (nerve growth factor). NGF increases the growth of cholinergic neurons, which are stimulated by the neurotransmitter, acetylcholine. Acetylcholine serves as a chemical messenger between nerve cells, and is particularly essential for memory function.

CAUTIONS

None known.

Indole-3-Carbinol / Diindolymethane

(I3C / DIM)

DESCRIPTION/FUNCTION

I3C is a breakdown product from the digestion of cruciferous vegetables (bok choy, broccoli, brussels sprouts, cabbage, cauliflower, collards, kale, kohlrabi, turnips). I3C is converted by stomach acid to DIM and ICZ (indolylcarbazole).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Cruciferous vegetables.

MAINTENANCE/THERAPEUTIC RANGE

200 mg to 800 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer (breast, cervical, colorectal, prostate).

COMMENTS

Some evidence indicates that I3C and DIM should be used to prevent cancer, not treat it.

CAUTIONS

Avoid if pregnant.

Inosine

DESCRIPTION/FUNCTION

Inosine is classified as a purine ribonucleoside. It is derived from animal tissue, especially intestines, and was originally used in food processing and flavoring (disodium inosinate). Inosine, as part of inosine monophosphate (IMP), is used to synthesize adenosine monophosphate, which in turn leads to the high energy molecule, adenosine triphosphate (ATP).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Brewer's yeast, organ meats, and nutritional supplements.

MAINTENANCE/THERAPEUTIC RANGE

1 g to 5 g.

POSSIBLE THERAPEUTIC APPLICATIONS

Immune function; inflammation.

COMMENTS

Inosine may be helpful for nerve injuries. It may also be helpful for heart problems. Research does not support inosine being helpful for athletes.

CAUTIONS

Avoid if you have gout, since inosine is eventually converted to uric acid.

Inositol

(Myo-inositol; Phosphatidylinositol)

DESCRIPTION/FUNCTION

Inositol is often classified as a B-vitamin. As phosphatidylinositol, it is present in cell membranes. Functions include the mediation of cellular responses to external stimuli, nerve transmissions, and regulation of enzyme activity. It also exerts lipotropic activity (fat metabolism in the liver).

DRI (RDA or AI for Adults)

None. Classified as vitamin-like, but the body can manufacture it.

MAJOR SOURCES

Organ meats (liver, heart), whole grains, vegetables, nuts, legumes.

MAINTENANCE/THERAPEUTIC RANGE

100 mg to 10,000 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Anxiety; depression; obsessive-compulsive disorder (OCD); panic disorder.

COMMENTS

Inositol exerts its psychological actions by increasing GABA levels (gamma aminobutyric acid). GABA is an inhibitory neurotransmitter. Inositol may also have antioxidant properties.

CAUTIONS

None known, although large doses can have a laxative effect.

Inositol Hexaphosphate

(IP-6; Phytate; Phytic Acid)

DESCRIPTION/FUNCTION

Phytic acid (phytate) is a component of plant fiber found in whole grains, nuts, seeds, and legumes. It is composed of inositol and six phosphate molecules. Inositol hexaphosphate (IP-6) is the more accurate and scientific name for phytic acid.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Whole grains, nuts, seeds, and legumes.

MAINTENANCE/THERAPEUTIC RANGE

1 g to 5 g.

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer (breast, colon, liver, prostate); high cholesterol; high triglycerides; kidney stones.

COMMENTS

The IP-6 found in raw, unprocessed foods can bind with many minerals (calcium, copper, iron, magnesium, manganese, zinc) and reduce their absorption.

CAUTIONS

Consult with your health practitioner if you are taking a blood thinning drug. Take about 30 minutes before meals to avoid reduced mineral absorption.

Iodine

DESCRIPTION/FUNCTION

Iodine is classified as a trace mineral. It is necessary for synthesis of thyroid hormones. Thyroid hormones stimulate the basal rate of metabolism, oxygen consumption, and heat production. These hormones are necessary for normal nervous system development, and linear growth.

DRI (RDA or AI for Adults)

Adults: 150 mcg.
Pregnancy: 220 mcg. Lactation: 290 mcg.

MAJOR SOURCES

Kelp, iodized salt.

MAINTENANCE/THERAPEUTIC RANGE

100 mcg to 10 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Fibrocystic breasts.

COMMENTS

Potassium iodide tablets are used when there is a radiation emergency. It protects the thyroid gland from radioactive iodine (iodine-131). Raw cruciferous vegetables (cabbage family) contain isothiocyanates (also called goitrogens), which can interfere with iodine uptake by the thyroid gland.

CAUTIONS

Consult with your health practitioner if you are on thyroid medication. Supplementing with potassium iodide (KI) may cause problems with ACE inhibitors and potassium-sparing diuretics.

Iron

DESCRIPTION/FUNCTION

Iron is classified as a trace mineral. It is essential for the formation of hemoglobin and myoglobin, and oxygen transport. Iron also facilitates transfer of electrons in the electron transport chain.

DRI (RDA or AI for adults)

Males: 8 mg. Females ages 19-50: 18 mg. Females over 50: 8 mg.
Pregnancy: 27 mg. Lactation: 9 mg.

MAJOR SOURCES

Clams, oysters, chicken liver, pumpkin seeds, turkey liver, beef heart, beef kidney, beef liver, pistachios, blackstrap molasses, beef, lamb.

MAINTENANCE/THERAPEUTIC RANGE

10 mg to 100 mg. (Only take for iron deficiency anemia.)

POSSIBLE THERAPEUTIC APPLICATIONS

Anemia (iron deficient).

COMMENTS

Many processed foods are fortified with iron. Many multi-vitamin and mineral supplements contain iron. Too much iron is not a good thing. Iron is a pro-oxidant, meaning it can create free radicals. It may contribute to heart disease by increasing the likelihood for LDL-cholesterol to oxidize. Most adults do not need supplemental iron. If you need to take an iron supplement, find one with chelated iron, not one containing inorganic iron (ferrous sulfate). Iron from animal sources (heme iron) absorbs better than from vegetable sources (nonheme). Nonheme iron will absorb better if taken with vitamin C.

CAUTIONS

Consult with your health practitioner before taking.

Kava

(Piper methysticum)

DESCRIPTION/FUNCTION

Kava (also called Kava Kava) is a Polynesian shrub that belongs to the pepper family. The Polynesians make a beverage from its roots, which are mashed and fermented in water. The bitter-tasting drink produces a sense of well-being, and is often offered to guests as a sign of friendship. Active ingredients include kava lactones (kavain, methysticin, yangonine), chalcones (flavokavin).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Roots and rhizome.

MAINTENANCE/THERAPEUTIC RANGE

200 mg to 700 mg (standardized to 30% kava lactones).

POSSIBLE THERAPEUTIC APPLICATIONS

Anxiety; inflammation; insomnia; menopause.

COMMENTS

People living in the South Pacific have used kava for several thousand years. However, its use in more modern cultures has raised some concern. There have been cases of hepatitis and liver failure attributed to kava consumption. The problems may be due to excessive intake, impurities from processing, or combining it with other drugs, including alcohol. Kava's beneficial effects may be due to increasing GABA or decreasing dopamine.

CAUTIONS

Avoid if pregnant. Do not use while driving or doing any activity that requires fine motor skills or judgement. Do not combine with alcohol or other recreational drugs. Do not use if you are taking various medications. Do not use if you have hepatitis, depression, or Parkinson's disease.

Kombucha Tea

DESCRIPTION/FUNCTION

Kombucha tea is prepared from a variety of bacteria and yeasts, along with black tea or green tea, and sugar. The mixture is fermented at room temperature for about ten days. The finished mixture contains alcohol, amino acids, B-vitamins, enzymes, minerals, and organic acids.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Fermented mixture of bacteria, yeasts, tea, sugar.

MAINTENANCE/THERAPEUTIC RANGE

1 oz. to 4 oz.

POSSIBLE THERAPEUTIC APPLICATIONS

None confirmed through research.

COMMENTS

There are concerns that kombucha tea can contain various pathogenic organisms, especially when prepared at home. If the mixture gets contaminated, then the pathogenic organisms (bacteria or fungi) can multiply to amounts that are toxic. People who make or sell kombucha tea attribute many benefits to its consumption, but there is no scientific support for its use.

CAUTIONS

Do not take if you are pregnant, immune compromised, or have hepatitis. Because of risks of contamination, it may be wise to avoid kombucha altogether.

Krill Oil

DESCRIPTION/FUNCTION

Krill are small, shrimp-like crustaceans that are mostly found in the cold waters of the Antarctic. There are about 90 species of krill, ranging in size from about 0.3 inches to 2.5 inches. They tend to swarm in large quantities, feeding on diatoms (tiny algae). Krill are eaten by fish, birds, and some whales. Krill oil contains omega-3 fatty acids (EPA, DHA), but they are different from those found in fish oil. Krill oil's omega-3s contain phospholipids (mostly phosphatidylcholine), whereas fish oil contains triglycerides. This difference makes krill oil more resistant to oxidation (rancidity). Krill oil also contains astaxanthin, a carotenoid with strong antioxidant properties.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Krill.

MAINTENANCE/THERAPEUTIC RANGE

1,000 mg to 2,000 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

High cholesterol; high triglycerides; premenstrual syndrome.

COMMENTS

Animal research shows krill oil protecting against skin cancer. While research is limited so far, with krill oil's combination of omega-3 fatty acids, phospholipids, and antioxidants, it will probably help any disorder that would benefit from any one of these ingredients. Neptune Technologies & Bioresources, Inc. produces Neptune Krill Oil, one source of krill oil for products in the marketplace. Aker BioMarine is another company, with its Superba Krill Oil.

CAUTIONS

Consult with your health practitioner if you are taking a blood thinning drug, or if you have allergies to seafood.

Kudzu

(Pueraria lobata; Pueraria thomsonii)

DESCRIPTION/FUNCTION

Kudzu is a vine native to China and Japan. As an herb, its use in traditional Chinese medicine goes back several thousand years. Kudzu was introduced into the southeastern U.S. in the mid-1800s for animal feed and for controlling soil erosion. However, it is an aggressive weed, and it is now found growing in ditches, and on trees and telephone poles. Active ingredients include isoflavonoids (daidzein, daidzin, genistein, puerarin) and triterpene glycosides.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Roots.

MAINTENANCE/THERAPEUTIC RANGE

50 mg to 400 mg (standardized to isoflavonoids or daidzin).

POSSIBLE THERAPEUTIC APPLICATIONS

Alcoholism.

COMMENTS

Some research shows that kudzu may be helpful for various heart problems (arrhythmias, circulation, cholesterol), lower blood sugar levels, and have antioxidant properties.

CAUTIONS

Consult with your health practitioner if you have diabetes, a hormone-sensitive cancer (breast, ovarian, uterine), or are taking blood thinning or contraceptive medications.

Larch Arabinogalactan

(Larix occidentalis)

DESCRIPTION/FUNCTION

Arabinogalactans are a group of fibrous, water-soluble hemicelluloses (polysaccharides). They consist of chains of galactose and arabinose, forming branches of varying lengths.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Processed wood of the Western larch tree is used in supplements. Arabinogalactans are also found in foods, including carrots and radishes.

MAINTENANCE/THERAPEUTIC RANGE

1 g to 10 g.

POSSIBLE THERAPEUTIC APPLICATIONS

Immune function.

COMMENTS

Arabinogalactan can stimulate natural killer cell cytotoxicity, and enhance other functional aspects of the immune system. It can also ferment in the intestines, increasing the beneficial bacteria (Bifidobacteria, Lactobacilli), and produce short-chain fatty acids, which benefit the colonocytes. Part of the medicinal effects of echinacea and ginseng are attributed to their arabinogalactan content.

CAUTIONS

None significant.

Lemon Balm

(Melissa officinalis)

DESCRIPTION/FUNCTION

Lemon balm is native to southern Europe and northern Africa (Mediterranean region). It is a member of the mint family. The leaves are used to add flavor to desserts and beverages. Active ingredients include caffeic acid derivatives (rosmarinic), flavonoids (cynaroside, cosmosiin, rhamnocitrin, isoquercitrin), glycosides, phenolic acids (caffeic, ferulic), polyphenols (rosmarinic acid), triterpenes (ursolic acid), volatile oils (geranial, neral, citronellal, linalool, geraniol).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Leaves.

MAINTENANCE/THERAPEUTIC RANGE

100 mg to 300 mg (4:1 extract).

POSSIBLE THERAPEUTIC APPLICATIONS

Cold sores (topical); insomnia.

COMMENTS

For cold sores (herpes labialis), a very concentrated extract is used topically. Lemon balm has some antibacterial and antiviral properties. It can also reduce nervousness, and it has shown benefit in reducing agitation associated with Alzheimer's disease. Lemon balm helps to alleviate indigestion.

CAUTIONS

None known.

Licorice

(Glycyrrhiza glabra)

DESCRIPTION/FUNCTION

Licorice is native to southern Europe and Asia. An extract of the root is glycyrrhizin, which becomes black in the process of extraction. Historically, licorice was used to flavor and sweeten medicines and cough mixtures. It is still used in confections, tobacco, alcoholic beverages, and chewing gum. The fiber is used for fire-fighting foam, insulation board, and gardening mulch. Active ingredients include cumestan derivatives (glycyrol, liqcoumarin), flavonoids (liquiritigenin, isolicoflavonol), isoflavonoids (formononetin, glabren, glabridin, glycyrrhisoflavone), steroids (beta-sitosterol, stigmasterol), triterpene saponins (glycyrrhetic acid, glycyrrhizin).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Roots and rhizome.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 1,500 mg (4:1 extract).

500 mg to 1,000 mg (DGL).

POSSIBLE THERAPEUTIC APPLICATIONS

Chronic fatigue syndrome; eczema (topical); HIV/AIDS; liver support (hepatitis B, C); immune function; inflammation; ulcers.

COMMENTS

Many of licorice's components show antioxidant activity. Most licorice candy contains anise or fennel, not real licorice. Candy that contains real licorice should be limited to small quantities or not be consumed on a regular basis. DGL (deglycyrrhizinated licorice) does not have some of the negative side effects associated with regular licorice (e.g., hypertension, potassium loss).

CAUTIONS

Avoid if pregnant. Do not take if you have high blood pressure. Do not use for long periods of time, unless under medical supervision. Increase potassium intake while using licorice. Consult with your health practitioner if you are using any kind of medication.

Lutein / Zeaxanthin

DESCRIPTION/FUNCTION

Lutein and zeaxanthin are xanthophylls, members of the carotenoid family. They are isomers of each other. They are the primary carotenoids found in the macula, the central area of the retina.

DRI (RDA or AI for Adults)

None.

MAJOR SOURCES

Vegetables, including corn and spinach, are good food sources of lutein and zeaxanthin. Nutritional supplements often use marigold flowers as the source.

MAINTENANCE/THERAPEUTIC RANGE

Lutein: 3 mg to 20 mg. Zeaxanthin: 200 mcg to 1,000 mcg.

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer (breast, colorectal, lung); cataracts; macular degeneration.

COMMENTS

Lutein and zeaxanthin are most beneficial for vision. They may act as filters to protect the macula from some damaging forms of light (blue and near-ultraviolet).

CAUTIONS

None known.

Lycopene

DESCRIPTION/FUNCTION

Lycopene is a member of the carotenoid family. (Other commonly supplemented carotenoids include beta-carotene, lutein, and zeaxanthin). It forms the red pigment found in tomatoes, watermelon, papaya, guava, paprika, and pink grapefruit.

DRI (RDA or AI for Adults)

None.

MAJOR SOURCES

Cooked tomato products (sauce, paste, powder, ketchup) are the best food sources, since cooking makes lycopene more bioavailable. Other sources are watermelon, papaya, guava, paprika, and pink grapefruit.

MAINTENANCE/THERAPEUTIC RANGE

3 mg to 20 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Asthma; cancer (breast, lung, ovarian, prostate); coronary heart disease.

COMMENTS

Lycopene seems to have the strongest antioxidant properties of all the carotenoids studied to date.

CAUTIONS

None known.

Lysine

(L-Lysine)

DESCRIPTION/FUNCTION

Lysine is classified as an essential amino acid. It can be converted to hydroxylysine (aided by vitamin C and iron), which is used in collagen synthesis for connective tissue.

DRI (RDA or AI for adults)

12 mg/kg/day.

MAJOR SOURCES

Animal proteins (dairy, eggs, fish, meat, poultry), and to a lesser extent, legumes, whole grains, nuts, seeds.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 3,000 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Cold sores; osteoporosis.

COMMENTS

While present in non-animal foods, lysine may be the limiting amino acid in vegan diets. Lysine increases the absorption of calcium and decreases its excretion. As with all amino acids, supplements should be taken on an empty stomach, or at least separate from protein foods.

CAUTIONS

None significant.

Maca

(Lepidium meyenii; Lepidium peruvianum)

DESCRIPTION/FUNCTION

Maca, which has a high frost tolerance, is found in the high plateaus of the Andes mountains in Peru. It has a long history of use in this region. Its tuber, containing starch, protein, fiber, and minerals, is eaten as a food by humans and livestock. Active ingredients include alkaloids (macaina), lipids (alpha-linolenic acid, oleic acid, palmitic acid), glucosinolates, macaene, macamide, sterols (beta-sitosterol, brassicasterol, campesterol, ergosterol, ergostadienol, stigmasterol).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Tubers.

MAINTENANCE/THERAPEUTIC RANGE

1,500 mg to 3,000 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Erectile dysfunction; infertility (male).

COMMENTS

Research on rats and humans show that maca increases sexual desire (libido). Human research also shows that maca increases sperm quality and quantity.

CAUTIONS

Avoid if pregnant.

Magnesium

DESCRIPTION/FUNCTION

Magnesium is classified as a macromineral. It is required for many coenzyme oxidation-phosphorylation reactions; nerve impulse transmissions; muscle relaxation; component of bone structure.

DRI (RDA or AI for Adults)

Males: 19-30 (400 mg); 31 and older (420 mg).

Females: 19-30 (310 mg); 31 and older (320 mg).

Pregnancy: 19-30 (350 mg); 31 and older (360 mg).

Lactation: 19-30 (310 mg); 31 and older (320 mg).

MAJOR SOURCES

Green leafy vegetables, legumes, nuts, seeds.

MAINTENANCE/THERAPEUTIC RANGE

300 mg to 1,000 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Asthma; cardiac arrhythmias; chronic fatigue syndrome; constipation; coronary heart disease; diabetes; fibromyalgia; headache (cluster, migraine); high blood pressure; high cholesterol; kidney stones; mitral valve prolapse; multiple sclerosis; osteoporosis; premenstrual syndrome; stroke.

COMMENTS

Women are urged to take large amounts of calcium for osteoporosis. Large amounts of calcium can reduce magnesium absorption if taken at the same time. Magnesium deficiency can cause coronary artery spasm (vasospasm). Women are more likely than men to get a heart attack caused by vasospasm. Something to think about. Alcoholism increases the need for magnesium.

CAUTIONS

Consult with your health practitioner if you have kidney disease. High doses can cause diarrhea.

Maitake Mushroom

(Grifola frondosa)

DESCRIPTION/FUNCTION

Maitake is a mushroom found in North America, Europe, and Japan. Medicinal mushrooms have a long history of use in China and Japan. Many of medicinal mushrooms' benefits are attributed to their beta-glucan content. Besides beta-glucan, maitake contains lectins, which are plant proteins having antibody-like properties. Maitake is also eaten as a food.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Mushroom (fruiting body).

MAINTENANCE/THERAPEUTIC RANGE

1 g to 5 g.

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer; diabetes; high blood pressure; HIV/AIDS; immune function.

COMMENTS

The most active component of maitake appears to be beta-D-glucan, usually called D-fraction. Supplements with maitake D-fraction require much smaller amounts and are standardized. Maitake is often combined with reishi and shiitake mushrooms.

CAUTIONS

Consult with your health practitioner if you have diabetes, since you may have to adjust your medication.

Malic Acid

DESCRIPTION/FUNCTION

Malic acid is a member of the alpha-hydroxy acids (others include glycolic acid, lactic acid, tartaric acid). It is also called a fruit acid, and is found in many fruits (apples, apricots, cherries, nectarines, passion fruit, peaches, pears, plums, prunes, raspberries, strawberries). Prunes have the highest amount of malic acid. As a supplement, it is usually combined with magnesium. Malic acid is also an intermediate in the Krebs Cycle.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Various fruits and magnesium malate supplements.

MAINTENANCE/THERAPEUTIC RANGE

1,000 mg to 2,500 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Fibromyalgia.

COMMENTS

Magnesium malate contains about 85% malic acid.

CAUTIONS

None known.

Manganese

DESCRIPTION/FUNCTION

Manganese is classified as a trace mineral. It is essential for normal brain function; role in enzyme systems, collagen formation, bone growth, urea formation, fatty acid and cholesterol synthesis, and digestion of protein.

DRI (RDA or AI for Adults)

Males: 2.3 mg. Females: 1.8 mg.
Pregnancy: 2.0 mg. Lactation: 2.6 mg.

MAJOR SOURCES

Whole grains, legumes, nuts, tea.

MAINTENANCE/THERAPEUTIC RANGE

2 mg to 10 mg. (Amounts higher than 10 mg are okay for short periods of time.)

POSSIBLE THERAPEUTIC APPLICATIONS

Osteoarthritis; osteoporosis; premenstrual syndrome.

COMMENTS

As a component of the enzyme, Mn-SOD, has antioxidant properties.

CAUTIONS

Consult with your health practitioner if you have liver disease.

Mannose

(D-Mannose)

DESCRIPTION/FUNCTION

Mannose is a simple sugar related to glucose. In the body, it is usually found attached to a protein (glycoprotein). In this form, it serves as a recognition marker for the particular protein, aiding in its cellular distribution.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Nutritional supplements.

MAINTENANCE/THERAPEUTIC RANGE

2 g to 5 g every 2 to 6 hours for several days.

POSSIBLE THERAPEUTIC APPLICATIONS

Urinary tract infections.

COMMENTS

Mannose treats and helps to prevent urinary tract infections (UTIs) by coating *E. coli* bacteria (which cause most urinary infections), preventing the bacteria from adhering to the walls of the bladder and urinary tract. Combining with cranberry extract is even more effective.

CAUTIONS

None known.

Mastic Gum

(*Pistacia lentiscus*)

DESCRIPTION/FUNCTION

Mastic gum comes from the mastic tree, a small evergreen tree or shrub. The tree is native to the Mediterranean region. When incisions are made in the bark, a resinous gum exudes. The gum is used as an astringent, an ingredient in varnishes, and in the production of chewing gum. Active ingredients include triterpenes (isomastic acid, mastic acid, oleanic acid, tirucallol), and a volatile oil (alpha-pinene).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Bark resin.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 2,000 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Ulcers (peptic).

COMMENTS

Mastic gum has a protective effect on the gastric mucosa, and can also kill some types of bacteria, including *Helicobacter pylori*, which can cause ulcers. Mastic chewing gum can be used to prevent and treat periodontal disease, such as gingivitis.

CAUTIONS

None known.

Medium-Chain Triglycerides

(MCT)

DESCRIPTION/FUNCTION

Triglycerides are compounds made up of three fatty acids bound to glycerol. Fatty acids consist of linkages of carbon atoms with a methyl group (CH₃) at one end and a carboxylic acid (COOH) at the other. A fatty acid chain may be as short as 4 carbon linkages or as long as 22 carbon linkages. Triglycerides make up most animal and vegetable fats. Medium-chain triglycerides are a mix of 6 to 12 carbon linkages, but are predominately 8 to 10 carbon linkages.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Processed coconut oil.

MAINTENANCE/THERAPEUTIC RANGE

1 tbsp to 3 tbsp, taken with meals.

POSSIBLE THERAPEUTIC APPLICATIONS

Epilepsy; obesity.

COMMENTS

The main benefit to using MCTs is their ease of absorption. They are helpful for those with malabsorption syndrome.

CAUTIONS

Consult with your health practitioner if you have diabetes or liver problems. High amounts can cause GI disturbances, including diarrhea, gas, and nausea.

Melatonin

DESCRIPTION/FUNCTION

Melatonin, produced by the pineal gland, is a naturally occurring hormone that is released into the bloodstream during periods of darkness. It plays a role in the body's circadian rhythm. Melatonin helps to regulate physiological functions that occur within a 24-hour period, including sleep patterns, and changes in body temperature, blood pressure, and heart rate.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Made in the body and nutritional supplements.

MAINTENANCE/THERAPEUTIC RANGE

0.3 mg to 10 mg (higher doses, up to 50 mg, are used under medical supervision).

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer (prostate: high doses and combined therapy); epilepsy; fibromyalgia; heartburn; insomnia; jet lag; headache (cluster, migraine); tardive dyskinesia.

COMMENTS

Melatonin is produced in the body's pineal gland by converting tryptophan (an amino acid) to serotonin and then to melatonin. Melatonin should only be taken before bedtime, and at the same time every night. Exposure to full-spectrum light during the day helps the body's production of melatonin, and sleeping in total darkness is also important. Melatonin's sleep effects last about three to four hours. Quick release supplements help with falling asleep, and timed release supplements may benefit those who wake up several hours after falling asleep. Melatonin also has antioxidant properties. Finally, the enterochromaffin cells of the stomach wall secrete many times more melatonin than the pineal gland. This melatonin may increase bicarbonate production in the duodenum, neutralizing the acid released from the stomach.

CAUTIONS

Avoid if pregnant. Consult with your health practitioner if you have seizures, depression, or are taking immunosuppressants or CNS depressants.

Methionine

(L-Methionine; DL-Methionine)

DESCRIPTION/FUNCTION

Methionine is classified as an essential, sulfur-containing amino acid. It can be converted into L-cysteine, and then to glutathione, which is an excellent antioxidant. It can also be converted to SAME and taurine, and homocysteine.

DRI (RDA or AI for adults)

Methionine plus cystine: 13 mg/kg/day.

MAJOR SOURCES

Animal protein (fish, meat, poultry, dairy, eggs).

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 2,000 mg. (Higher doses are used for treatment of acute acetaminophen poisoning.)

POSSIBLE THERAPEUTIC APPLICATIONS

Liver support.

COMMENTS

Without a sufficient intake of vitamins B6, B12, and folic acid, methionine can be converted to homocysteine, which is an independent risk factor for coronary artery disease. Taking methionine with foods containing salt and nitrates (processed meats) increases the risk for gastric cancer (stomach). As with all amino acids, supplements should be taken on an empty stomach, or at least separate from protein foods.

CAUTIONS

Consult with your health practitioner if you have schizophrenia, liver disease, or cancer. Methionine should be used cautiously. Even for acetaminophen poisoning, it would be better to use NAC.

Methylsulfonylmethane

(MSM)

DESCRIPTION/FUNCTION

MSM is a sulfur-containing compound that is naturally present in the body. It is similar to dimethyl sulfoxide (DMSO), but easier to use and safer. Unlike DMSO, MSM is odorless and tasteless. MSM is a source of sulfur, which can be converted into the amino acids, methionine and cysteine.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Nutritional supplements.

MAINTENANCE/THERAPEUTIC RANGE

1 g to 5 g.

POSSIBLE THERAPEUTIC APPLICATIONS

Osteoarthritis.

COMMENTS

Very little research has been conducted on the benefits of MSM.

CAUTIONS

None known.

Milk Thistle

(Silybum marianum)

DESCRIPTION/FUNCTION

Milk thistle is native to Europe. It contains three powerful liver-protective agents. They are silybin, silydianin, and silychristin, and are usually collectively referred to as silymarin. Also present are flavonoids, including apigenin, naringenin, and quercetin.

DRI (RDA or AI for Adults)

None.

MAJOR SOURCES

Seeds.

MAINTENANCE/THERAPEUTIC RANGE

100 mg to 1,000 mg (standardized to 70% to 80% silymarin).

POSSIBLE THERAPEUTIC APPLICATIONS

Inflammation; liver support (hepatitis B, C); psoriasis.

COMMENTS

The effects of silymarin are well researched, showing protection against such hepato-toxins as alcohol, carbon tetrachloride, pesticides, heavy metals, and acetaminophen overdose. Not only can silymarin protect liver cells, it can regenerate already damaged ones. Additionally, silymarin was shown to increase liver, stomach, and intestinal glutathione, a powerful antioxidant.

CAUTIONS

None significant.

Modified Citrus Pectin

(MCP)

DESCRIPTION/FUNCTION

Modified citrus pectin is a form of citrus pectin (a water-soluble fiber) that has been altered (hydrolyzed), producing shorter carbohydrate chains (polysaccharides). The shorter chains are more water-soluble and bioavailable than regular citrus pectin.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Pectin from lemon and orange rinds that has been hydrolyzed.

MAINTENANCE/THERAPEUTIC RANGE

10 g to 30 g.

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer.

COMMENTS

MCP may help to inhibit the spread of cancer (metastasis), especially prostate cancer.

CAUTIONS

None known.

Molybdenum

DESCRIPTION/FUNCTION

Molybdenum is classified as a trace mineral. It is part of the enzymes, xanthine oxidase and aldehyde oxidase; possibly helps reduce incidence of dental caries; role in metabolism of purines and pyrimidines, and oxidation of sulfite.

DRI (RDA or AI for Adults)

Adults: 45 mcg.

Pregnancy/Lactation: 50 mcg.

MAJOR SOURCES

Legumes, dairy products, dark green leafy vegetables.

MAINTENANCE/THERAPEUTIC RANGE

100 mcg to 500 mcg.

POSSIBLE THERAPEUTIC APPLICATIONS

None significant.

COMMENTS

Molybdenum assists the body in detoxifying sulfites by converting them to nonirritating sulfates. (Some people with asthma react to sulfite food additives.) Molybdenum is a copper antagonist and some forms of it may be useful in treating Wilson's disease.

CAUTIONS

May aggravate gout.

Muira Puama

(Ptychopetalum olacoides; Ptychopetalum uncinatum)

DESCRIPTION/FUNCTION

Muira puama is an herb native to Brazil and Guyana. Active ingredients include alkaloids (muirapuamine), organic acids (cerotic, melissic, montanic), sterols (beta-sitosterol, campesterol, lupeol).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Root and bark.

MAINTENANCE/THERAPEUTIC RANGE

1,000 mg to 2,000 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Erectile dysfunction.

COMMENTS

Very little research has been done on this herb. Indigenous peoples traditionally used muira puama to treat diarrhea, loss of appetite, and for sexual disorders.

CAUTIONS

None known, but probably should be avoided if pregnant.

N-Acetyl Cysteine (NAC)

DESCRIPTION/FUNCTION

NAC is a derivative of the amino acid, L-cysteine. It is more stable and better absorbed than cysteine. As a source of cysteine, NAC is used to increase levels of glutathione, an important tripeptide antioxidant (cysteine, glutamic acid, glycine).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Pharmaceutical (IV and inhalant) and nutritional supplements.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 2,000 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Bronchitis; cancer (colorectal); COPD; epilepsy; flu; HIV/AIDS; immune function; liver support; memory loss.

COMMENTS

NAC, as a precursor to glutathione, is used to protect the liver from various poisons, including mushroom (*Amanita phalloides*) and acetaminophen overdose. It is helpful for many lung and bronchial problems, often being used with an inhaler. Some health practitioners recommend increasing vitamin C intake to prevent cysteine from oxidizing to cystine.

CAUTIONS

Use with caution if you have a gastric ulcer. Take with food. Take NAC with sufficient water to reduce the chance of getting kidney stones.

NADH

(Nicotinamide Adenine Dinucleotide Hydrogen)

DESCRIPTION/FUNCTION

NADH is the reduced form of NAD^+ , which is a coenzyme that acts as a hydrogen acceptor in many biochemical reactions. NADH is a hydrogen donor. For example, it is used in the electron transport chain for the production of ATP (adenosine triphosphate), a high energy molecule that is vital in the production of energy. NADH is the coenzyme form of vitamin B3 (niacin).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Produced in the body from niacin, and nutritional supplements.

MAINTENANCE/THERAPEUTIC RANGE

5 mg to 10 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Chronic fatigue syndrome; coronary heart disease; memory loss; Parkinson's disease.

COMMENTS

It is recommended that NADH be taken on an empty stomach, or as an enteric coated supplement (Enada).

CAUTIONS

None known.

Nattokinase

DESCRIPTION/FUNCTION

Nattokinase is an enzyme derived from natto. Natto is a fermented, cheese-like food produced from soybeans. It is made by adding the culture, *Bacillus natto*, to boiled soybeans. Natto has been a part of the Japanese diet for more than one thousand years. Nattokinase has fibrinolytic properties, meaning that it can dissolve blood clots.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Enzyme extracted from natto.

MAINTENANCE/THERAPEUTIC RANGE

100 mg to 300 mg (enteric-coated).

POSSIBLE THERAPEUTIC APPLICATIONS

Coronary heart disease; high blood pressure; stroke (ischemic).

COMMENTS

Nattokinase has clot busting properties as effective as prescription drugs. Animal and human research show it is effective for thinning and dissolving blood clots. Also, one research study showed that nattokinase lowered elevated blood pressure by 10%. For people who fly long distances, it may help to prevent a deep vein thrombosis (blood clot in a leg vein).

CAUTIONS

Consult with your health practitioner if you are taking blood thinning medication or have a bleeding disorder.

Noni Juice

(Morinda citrifolia)

DESCRIPTION/FUNCTION

Noni (also commonly called Indian mulberry) is a small evergreen tree native to Polynesia, but it can also be found in Australia, India, and Southeast Asia. The fruit has an unpleasant odor and taste. The bark and root were traditionally used for producing dyes. Active ingredients include anthraquinones, beta-sitosterol, flavone glycosides, limonene, minerals (especially potassium), rutin, ursolic acid.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Primarily the fruit, but also the roots.

MAINTENANCE/THERAPEUTIC RANGE

1 tbsp to 2 tbsp.

POSSIBLE THERAPEUTIC APPLICATIONS

Immune function; parasites.

COMMENTS

The little research done on noni is limited to animals. It may have anticancer and anti-inflammatory properties, but more research is needed.

CAUTIONS

Because noni is high in potassium, Consult with your health practitioner if you have kidney disease or are taking potassium-sparing diuretics.

Octacosanol

DESCRIPTION/FUNCTION

Octacosanol is a lipid alcohol with a chain length of 28 carbons. It is found in some vegetable waxes, and is sometimes referred to as a waxy alcohol.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Sugar cane and wheat germ.

MAINTENANCE/THERAPEUTIC RANGE

1 mg to 10 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Parkinson's disease (if not taking L-Dopa).

COMMENTS

Octacosanol has been used for years to increase athletic endurance.

This has not been supported by research.

CAUTIONS

Do not use if you are taking L-Dopa for Parkinson's disease.

Olive Leaf

(Olea europaea)

DESCRIPTION/FUNCTION

The cultivated olive is native to the eastern Mediterranean region, but is now cultivated in many areas of the world. The olive is grown for its fruits (drupes), which are eaten, and also provide an edible oil. The leaves are gaining notice for their therapeutic properties. Active ingredients found in the leaves include chalcones (olivin), flavonoids (luteolin, apigenine), glucosides (oleuropein), iridoide monoterpenes (oleoropine, ligstroside, oleoroside), triterpenes (oleanolic acid, maslinic acid).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Leaves.

MAINTENANCE/THERAPEUTIC RANGE

200 mg to 1,000 mg (standardized to 15% oleuropein).

POSSIBLE THERAPEUTIC APPLICATIONS

Diabetes; high blood pressure; immune function; infection.

COMMENTS

Olive leaf extract has antioxidant properties. It also may be helpful against various bacteria, viruses, and other parasites, probably due to its oleuropein content.

CAUTIONS

Consult with your health practitioner if you are taking medications for diabetes or high blood pressure.

Omega-3 Fatty Acids: Fish Oil

(EPA: eicosapentaenoic acid; DHA: docosahexaenoic acid)

DESCRIPTION/FUNCTION

Essential fatty acids (EFAs) are precursors of the hormone-like eicosanoids (prostaglandins, thromboxanes, leukotrienes) that participate in the regulation of blood pressure, heart rate, vascular dilation, blood clotting, lipolysis, immune response, and the central nervous system. Omega-3 fatty acids balance the action of arachidonic acid (excess AA metabolites can cause inflammation).

DRI (RDA or AI for Adults)

None. As alpha-linolenic acid (precursor to EPA & DHA):
Males: 1.6 g. Females: 1.1 g. Pregnancy: 1.4 g. Lactation: 1.3 g.

MAJOR SOURCES

Cold water fish are the best food sources, including salmon, tuna, mackerel, halibut, herring.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 3,000 mg of EPA/DHA. (Fish oil caps usually contain 18-30% EPA and 12-20% DHA.)

POSSIBLE THERAPEUTIC APPLICATIONS

Cardiac arrhythmias; cataracts; coronary heart disease; eczema; depression; high blood pressure; high triglycerides; inflammation; inflammatory bowel disease; macular degeneration (DHA); obesity; osteoporosis; psoriasis; Raynaud's disease; rheumatoid arthritis; stroke (ischemic).

COMMENTS

Make sure supplements are molecularly distilled so impurities have been removed. Due to the excessive consumption of grain oils, the modern diet has an omega-6/omega-3 ratio of at least 10:1. An optimal omega-6/omega-3 ratio is estimated to be around 2:1 to 3:1. Therefore, most people are consuming at least four times as much omega-6 fatty acids as is recommended. While omega-3s don't lower total cholesterol, they improve the LDL/HDL ratio.

CAUTIONS

Consult with your health practitioner if you have bipolar disorder or are taking blood thinning drugs (anticoagulant or antiplatelet).

Omega-6 Fatty Acid: Borage / Primrose Oil

(GLA: Gamma-Linolenic Acid)

DESCRIPTION/FUNCTION

Gamma-Linolenic Acid (GLA) is a derivative of the essential fatty acid, linoleic acid. Essential fatty acids (EFAs) are precursors of the hormone-like eicosanoids (prostaglandins, thromboxanes, leukotrienes) that participate in the regulation of blood pressure, heart rate, vascular dilation, blood clotting, lipolysis, immune response, and the central nervous system.

DRI (RDA or AI for Adults)

None. As linoleic acid (precursor to GLA):

Males: 19-50 (17 g); 51 and older (14 g).

Females: 19-50 (12 g); 51 and older (11 g).

Pregnancy/Lactation: 13 g.

MAJOR SOURCES

Black currant seed oil, borage seed oil, evening primrose oil.

MAINTENANCE/THERAPEUTIC RANGE

100 mg to 500 mg of GLA.

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer (breast; when taken with tamoxifen); coronary heart disease; diabetes (neuropathy); eczema; fibrocystic breasts; high blood pressure; high triglycerides; inflammation; osteoarthritis; premenstrual syndrome; rheumatoid arthritis.

COMMENTS

Most research has been done on borage and primrose oils. The three primary sources of GLA have varying concentrations of it: evening primrose oil (9-10%), black current seed oil (12-14%), borage seed oil (20-24%). Taking GLA is not likely to increase pro-inflammatory arachidonic acid (AA) levels, since most GLA from supplements is converted to dihomo-gamma linolenic acid (DGLA), and then to prostaglandin E1 (PGE1), a beneficial prostaglandin. DGLA actually competes with AA, reducing inflammation.

CAUTIONS

Consult with your health practitioner if you are taking blood thinning drugs or phenothiazines (GLA reduces seizure threshold).

Oregano Oil

(Origanum vulgare)

DESCRIPTION/FUNCTION

Oregano comes from the prepared leaves of wild marjoram. Marjoram belongs to the mint family, and is native to Asia, Europe and northern Africa. As a seasoning, oregano is commonly used in Italian meals. Active ingredients include caffeic acid derivatives (rosmarinic acid), flavonoids (naringin), volatile oils (carvacrol, gamma-terpinene, p-cymene, linalool, myrcene, thymol).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Processed wild marjoram leaves.

MAINTENANCE/THERAPEUTIC RANGE

200 mg to 600 mg (standardized to about 50% carvacrol).

POSSIBLE THERAPEUTIC APPLICATIONS

Infection (intestinal parasites).

COMMENTS

Oregano oil supplements may come diluted with olive oil. Oregano has antioxidant properties. The oil is effective against a wide range of parasites. The diluted oil can be applied topically to treat various skin conditions (e.g., acne, insect bites, psoriasis).

CAUTIONS

Avoid if pregnant. Pure, undiluted oregano oil is irritating.

Pantethine

DESCRIPTION/FUNCTION

Pantethine is related to the B-vitamin, pantothenic acid (vitamin B-5). Pantothenic acid, through five steps, is converted to Coenzyme A. (Coenzyme A is important in the metabolism of carbohydrates and fats.) An intermediate molecule in this conversion is pantetheine. Pantethine is essentially two molecules of pantetheine linked together at their sulfur atoms (disulfide bond).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Small quantities made in the body and nutritional supplements.

MAINTENANCE/THERAPEUTIC RANGE

600 mg to 1,200 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

High cholesterol; high triglycerides.

COMMENTS

Pantethine may help to prevent cataracts. It may also help protect the liver from alcohol toxicity.

CAUTIONS

Consult with your health practitioner if you are taking a blood thinning drug.

Para-Aminobenzoic Acid

(PABA)

DESCRIPTION/FUNCTION

PABA is often classified as a B-vitamin, but it is not an actual vitamin. It is involved in red blood cell formation; metabolism of protein; stimulates production of folic acid in the intestines; topically used in sunscreens.

DRI (RDA or AI for Adults)

None.

MAJOR SOURCES

Organ meats, whole grains, eggs, dairy products, dark green vegetables.

MAINTENANCE/THERAPEUTIC RANGE

50 mg to 500 mg. (Higher doses under medical supervision.)

POSSIBLE THERAPEUTIC APPLICATIONS

Peyronie's disease; scleroderma; vitiligo.

COMMENTS

The form used therapeutically is called Potaba, and it is used in amounts up to 10 grams.

CAUTIONS

Avoid if you are taking sulfonamide antibiotics.

Passionflower

(*Passiflora incarnata*)

DESCRIPTION/FUNCTION

The passionflower family contains about 500 species. *Passiflora incarnata* is the species commonly used in supplements. Passionflowers are also the plants that passion fruit comes from. Passionflower is native to North and South America. Active ingredients include alkaloids (aribine, harmine, harman, harmol, harmaline, harmalol, loturine, passiflorine, yageine), polyphenols (apigenin, isovitexin, luteolin, vitexin, kaempferol, quercetin, rutin).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Herb (aerial parts).

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 1,500 mg (5:1 concentrate).

POSSIBLE THERAPEUTIC APPLICATIONS

Anxiety; insomnia.

COMMENTS

Passionflower is often combined with other herbs (chamomile, catnip, hops, scullcap, valerian) as a sleep aid. It may also reduce aggressiveness. Passionflower may also increase the pain threshold, making it easier to tolerate pain.

CAUTIONS

Avoid if pregnant (may stimulate uterus). Consult with your health practitioner if you are taking prescription medications for sleep. Do not combine with antihistamines during periods requiring fine motor skills and judgement, including operating motor vehicles.

Pau d'Arco
(*Tabebuia impetiginosa*)

DESCRIPTION/FUNCTION

Pau d'arco (also called ipe roxo, lapacho, taheebo) is native to South America. It has been used medicinally by native tribes of the rain forests for centuries. Active ingredients include aldehydes (benzaldehyde derivatives), organic acids (chrysophanic acid, benzoic acid derivatives), phytosterols (beta-sitosterol), quinones (lapachol, lapachone, deoxylapachol, xyloidone).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Inner bark.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 2,000 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Immune function; infection.

COMMENTS

This is a strong herb and should be used carefully. Not a lot of research has been done on it. It is mostly used to treat infections caused by bacteria, fungus, yeast, and intestinal parasites. It is used internally and topically. It was researched for treating cancer, but proved to be too toxic in the amounts needed.

CAUTIONS

Avoid if pregnant. Consult with your health practitioner if you are taking a blood thinning drug.

Peppermint

(*Mentha piperita*)

DESCRIPTION/FUNCTION

The mint genus includes peppermint, spearmint, and pennyroyal. Members of the mint family include basil, marjoram, oregano, rosemary, sage, savory, and thyme. Peppermint is native to Europe, but is grown in many parts of the world. Peppermint oil is the main product from the leaf, and is a valuable essential oil used in cooking, medicine, and cosmetics. Active ingredients include caffeic acid, flavonoids (apigenine, luteolin, xanthomicrol), volatile oil (menthol, menthone, menthyl acetate, menthofurane, limonene).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Leaves and extracted oil.

MAINTENANCE/THERAPEUTIC RANGE

Leaf: 500 mg to 2,000 mg (4:1 concentrate).

Oil: 0.6 mL to 1.2 mL.

POSSIBLE THERAPEUTIC APPLICATIONS

Flatulence; indigestion; irritable bowel syndrome (enteric coated).

COMMENTS

For IBS (irritable bowel syndrome), enteric-coated, peppermint oil capsules are taken between meals. The vapor from heated peppermint tea or oil can reduce nasal congestion. The oil, rubbed on the temples, may help to reduce headaches. For indigestion (dyspepsia), peppermint oil is often combined with caraway oil. Peppermint oil also has some antibacterial and antimicrobial properties.

CAUTIONS

Avoid high amounts during early pregnancy (may induce menstruation). Consult with your health practitioner if you have gallstones. Avoid if you have a hiatal hernia or GERD (gastroesophageal reflux).

Phenylalanine

(L-Phenylalanine; DL-Phenylalanine)

DESCRIPTION/FUNCTION

L-Phenylalanine is classified as an essential amino acid. It can be converted to tyrosine, which in turn is converted to the excitatory catecholamine neurotransmitters (dopa, dopamine, norepinephrine, epinephrine). The 'L' form exists in food naturally. When it is made in a lab, both the 'L' and 'D' forms are produced. The 'L' form may be separated and sold by itself, or the mixture can be left together, which is sometimes called DLPA.

DRI (RDA or AI for adults)

Phenylalanine plus tyrosine: 14 mg/kg/day.

MAJOR SOURCES

Animal proteins (dairy, eggs, fish, meat, poultry).

MAINTENANCE/THERAPEUTIC RANGE

L-Phenylalanine: 500 mg to 5,000 mg.

DL-Phenylalanine: 250 mg to 2,000 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Chronic fatigue syndrome; chronic pain (DLPA); depression (unipolar); Parkinson's disease.

COMMENTS

Since phenylalanine increases excitatory neurotransmitters, it should be taken early in the day to avoid sleep disturbances. Phenylalanine may help with weight loss by reducing appetite. DLPA can help with chronic pain if taken for at least two months. As with all amino acids, supplements should be taken on an empty stomach, or at least separate from protein foods.

CAUTIONS

If pregnant, avoid the 'D' and 'DL' forms. Do not combine with prescription medications for depression (especially MAOIs and neuroleptic drugs), Parkinson's disease, or various psychoses, including schizophrenia. Avoid if you have PKU. Consult with your health practitioner if you have high blood pressure.

Phosphatidylserine

(PS)

DESCRIPTION/FUNCTION

Phosphatidylserine (PS) is classified as a phospholipid. Its structure is a combination of essential fatty acid (linoleic or alpha-linolenic), monounsaturated or saturated fatty acid (stearic, palmitic, oleic, arachidonic), mineral acid (phosphoric), lipid alcohol (glycerol), and amino acid (serine). Phospholipids are major components of two-layered cellular membranes (lipid bilayer). They limit the passage of water and water-soluble compounds through the membrane, anchor proteins within the membrane, maintain membrane flexibility, facilitate intracellular signaling, are involved in hormone activity and fat digestion, plus many other roles. Phospholipids commonly contain one of the following: choline, ethanolamine, inositol, or serine. PS is the most abundant phospholipid in the brain.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Soybeans. Animal source not used now because of mad cow disease (BSE) concerns.

MAINTENANCE/THERAPEUTIC RANGE

100 mg to 300 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Depression; memory loss.

COMMENTS

Earlier research was done on BC-PS (bovine cortex PS), but because of concerns of mad cow disease, most manufacturers have switched to SB-PS (soy bean PS). The fatty acids in BC-PS are mostly saturated and monounsaturated, whereas the fatty acids in SB-PS are mainly polyunsaturated. PS can increase levels of neurotransmitters (acetylcholine, dopamine, serotonin). It can also lower cortisol levels produced by exercise-induced stress. Start with 200 mg to 300 mg per day for one or two months. Thereafter, 100 mg per day is usually sufficient.

CAUTIONS

None significant.

Pine Bark / Pycnogenols

(Pinus maritima; Pinus pinaster)

DESCRIPTION/FUNCTION

Pine bark extract comes from the French maritime pine, found in coastal southwestern France. Its main active ingredients are the OPCs (oligomeric proanthocyanidins). They are linked flavin-3-ols, and are also found in fruit (apples, bilberries, grape seeds and skins, cranberries), herbs (hawthorn, horse chestnut, witch hazel), legumes (peanut skins), dark chocolate, and wine. Most OPC research has been conducted by Jack Masquelier, Ph.D., Professor Emeritus, University of Bordeaux, France. He coined the term, pycnogenols, from *pycno* (thick) *gen* (generate), *ols* (flavonols). Flavonols are a class of colorless or reddish-brown polyphenols. Active ingredients include catechins (catechin, epicatechin), oligomeric proanthocyanidins, phenolic acids (caffeic, cinnamic acid, ferulic, fumaric, gallic, vanillic), tannins.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

French maritime pine bark.

MAINTENANCE/THERAPEUTIC RANGE

50 mg to 400 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Chronic venous insufficiency (edema); coronary heart disease; high blood pressure; high cholesterol; retinopathy.

COMMENTS

Pine bark extract has antioxidant activity. Pine bark extract and grape seed extract have very similar properties, and both were researched by Dr. Masquelier, starting in the late 1940s. Overall, he thinks grape seed extract is slightly better in its health promoting and disease fighting properties. Pycnogenol (singular) is a trade marked name of some products containing pine bark extract.

CAUTIONS

Consult with your health practitioner if you have an autoimmune disorder, diabetes, or are taking blood thinning medication.

Plicosanol

DESCRIPTION/FUNCTION

Plicosanol is a collection of lipid alcohols (also called fatty or waxy alcohols) with carbon chain lengths ranging from 22 to 34. The predominant lipid in policosanol is octacosanol, with a carbon chain length of 28.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Sugar cane and wheat germ.

MAINTENANCE/THERAPEUTIC RANGE

5 mg to 20 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Coronary heart disease; high cholesterol; high triglycerides; poor circulation.

COMMENTS

Most policosanol research was done in Cuba, presumably because they have a lot of sugar cane wax left over after removing the sugar. Policosanol can lower total- and LDL-cholesterol, and raise HDL-cholesterol. It may take several months before results are seen. Policosanol may also protect lipoproteins from oxidation.

CAUTIONS

Consult with your health practitioner if you are taking a blood thinning drug.

Pomegranate

(Punica granatum)

DESCRIPTION/FUNCTION

The pomegranate is a type of fruit native to northern India, northern Africa, and the Caucasian Mountains. It has been used extensively in the folk medicine of many cultures. Pomegranate juice contains several different types of phytochemicals, including polyphenols, such as anthocyanidins (delphinidin, cyanidin, pelargonidin) and hydrolyzable tannins (punicalin, pedunculagin, punicalagin, gallagic acid, ellagic acid). The most abundant polyphenols in pomegranate juice are the hydrolyzable tannins called punicosides (punicalagins A and B), which have free-radical scavenging properties. Punicalagins are absorbed into the human body and may have dietary value as antioxidants. Pomegranate juice contains more polyphenols than blueberry, cranberry, green tea, orange juice, or red wine.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Pomegranate fruit, rind, seed.

MAINTENANCE/THERAPEUTIC RANGE

100 mg - 600 mg (std. to 30% to 40% punicosides or punicalagins)

POSSIBLE THERAPEUTIC APPLICATIONS

Ageing; coronary heart disease; cancer (breast, colon, prostate); high blood pressure; inflammation; osteoarthritis.

COMMENTS

Research shows that pomegranate juice can be effective in reducing heart disease risk factors, including LDL oxidation (oxLDL), macrophage oxidative status, and foam cell formation, all of which are steps in atherosclerosis and cardiovascular disease. Tannins, such as punicalagins, have been identified as the primary components responsible for the reduction of oxidative stress which led to these risk factors. Pomegranate has been shown to reduce systolic blood pressure by inhibiting serum angiotensin-converting enzyme (ACE).

CAUTIONS

Consult with your health practitioner if you are taking medications, especially for high blood pressure.

Potassium

DESCRIPTION/FUNCTION

Potassium is classified as a macromineral. Potassium helps regulate acid-base equilibrium and osmotic pressure of body fluids; influences muscle activity, especially cardiac muscle.

DRI (RDA or AI for Adults)

Adults: 4,700 mg.

Lactation: 5,100 mg.

MAJOR SOURCES

Fruits, vegetables, dairy products.

MAINTENANCE/THERAPEUTIC RANGE

Adjust dietary intake to achieve 3,000 mg to 5,000 mg per day.

POSSIBLE THERAPEUTIC APPLICATIONS

High blood pressure; stroke.

COMMENTS

It is easier to increase potassium through dietary changes than using nonprescription supplements, which are limited to 99 mg per pill.

CAUTIONS

Consult with your health practitioner if you have kidney disease or are taking potassium-sparing diuretics or other heart medications (e.g., ACE inhibitors).

Prebiotics

(Fructo-Oligosaccharides; Inulin)

DESCRIPTION/FUNCTION

Prebiotics are food for the beneficial intestinal bacteria (*Bifidobacterium* and *Lactobacillus* species). They consist of nondigestible carbohydrates (short-chain oligosaccharides). Fructo-oligosaccharides (FOS) are produced commercially from sucrose using a special enzyme, whereas inulin is derived from chicory and Jerusalem artichoke. In the large intestine, the prebiotics feed the beneficial bacteria, causing lactic acid production and fermentation. The changes in the colonic environment make it less favorable for pathogenic bacteria. In addition, butyric acid and other short chain fatty acids are produced, which are used by the colonocytes (cells lining the large intestine).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Asparagus, bananas, chicory, Jerusalem artichoke, onions.

MAINTENANCE/THERAPEUTIC RANGE

1 g to 10 g.

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer (colon); constipation; diarrhea (from contaminated food); high triglycerides (inulin); irritable bowel syndrome; yeast infection.

COMMENTS

Prebiotics may also increase colonic absorption of calcium and magnesium.

CAUTIONS

None significant. To avoid gas and other intestinal events, start with small amounts and gradually increase.

Pregnenolone

DESCRIPTION/FUNCTION

Pregnenolone is converted from cholesterol into steroid hormones, including DHEA, androgens (e.g., testosterone), estrogens (e.g., estradiol), progestins (e.g., progesterone), glucocorticoids (e.g., cortisol), mineralocorticoids (e.g., aldosterone). It is found primarily in the adrenal gland, brain, and gonads.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Made in the body and supplements.

MAINTENANCE/THERAPEUTIC RANGE

5 mg to 100 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Memory loss.

COMMENTS

Pregnenolone is a GABA (inhibitory neurotransmitter) receptor antagonist and can increase acetylcholine (excitatory neurotransmitter). Hormone production decreases as we age, and some health practitioners use pregnenolone, DHEA, and other hormones to offset this decrease. Unfortunately, most research on pregnenolone was done in the 1940s.

CAUTIONS

Avoid if pregnant. Consult with your health practitioner if you have a hormone-sensitive cancer (breast, ovarian, uterine) or seizures.

Prickly Pear

(various species of *Opuntia* genus)

DESCRIPTION/FUNCTION

The prickly pear cactus is native to the southwestern United States and northern Mexico. Most of the immature plant (flowers, fruit, leaves, stems) has medicinal or food value.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Flowers, fruit, leaves, and stems.

MAINTENANCE/THERAPEUTIC RANGE

Varies considerably depending on the part of the plant used, how it is processed (food or supplement), and what it is being used for.

POSSIBLE THERAPEUTIC APPLICATIONS

Diabetes; hangover; immune support; prostate problems.

COMMENTS

For diabetes, the broiled, immature stems are eaten. Some cactus extracts show antioxidant and anti-inflammatory properties. A special extract is marketed for reducing symptoms related to excessive alcohol consumption.

CAUTIONS

Consult with your health practitioner if you have diabetes and are taking medication for it.

Probiotics

(*Lactobacillus acidophilus*; *Bifidobacteria bifidum*)

DESCRIPTION/FUNCTION

Probiotics are microbial food supplements that improve health by altering intestinal microbial balance. Several pounds of bacteria reside in the intestines, and it is important to cultivate the beneficial bacteria, rather than pathogenic bacteria. The beneficial bacteria cause lactic acid production and fermentation. The changes in the colonic environment make it less favorable for pathogenic bacteria to live. In addition, butyric acid and other short chain fatty acids are produced, which are used by the colonocytes (cells lining the large intestine). Beneficial bacteria can also produce some vitamins (e.g., B12, pantothenic acid, biotin, K).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Fermented foods (especially yogurt) and supplements.

MAINTENANCE/THERAPEUTIC RANGE

1 billion to 10 billion CFUs (colony-forming units).

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer (colon); diarrhea (contaminated food); eczema (infants); immune function; irritable bowel syndrome; yeast infection.

COMMENTS

To make yogurt, a culture containing the bacteria *Streptococcus thermophilus* and *Lactobacillus bulgaricus*, and sometimes *Lactobacillus acidophilus*, are used. Some yogurt products will not have live beneficial bacteria present. Antibiotic therapy often reduces the population of beneficial bacteria. *Lactobacillus species* reside in the vagina and can help with various problems. *Lactobacillus* bacteria need to reach the second half of the small intestine (ileum) alive, and *Bifidobacteria* bacteria need to reach the large intestine (colon) alive. Use supplements that are enteric coated, or take between meals, or take with food that is low in protein and fat. And use prebiotics.

CAUTIONS

None significant, but Consult with your health practitioner if you are severely immune compromised (e.g., HIV/AIDS).

Propolis

DESCRIPTION/FUNCTION

Propolis has been used for medicinal purposes for several thousand years. It is a waxy substance made by bees. Propolis is made from resin collected from the buds and bark of some trees that is mixed with other substances, including beeswax and salivary excretions. Propolis is used by bees as a cement and caulking in making and repairing their hives. The word, from Latin, means "before the city." Active ingredients include organic acids (benzoic, cinnamic, caffeic, ferulic, isoferulic, sinapic, caffeic acid phenethyl ester), polyphenols (apigenin, chrysin, galangin, isosakuranetin, kaempferol, luteolin, naringenin, pinobanksin, pinocembrin, quercetin, tectochrysin), resins, waxes.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Bee hives.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 5,000 mg (upper end of range used for 1 or 2 weeks).

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer; cold sores (topical); common cold; gum disease (topical); immune function; infection; inflammation; parasites; shingles (topical); wound healing (burns).

COMMENTS

Propolis may help with many infections, including those caused by bacteria, viruses, fungi (molds, yeasts), and other parasites. Besides taken internally, propolis products are available for topical use (skin ointment, shampoo, toothpaste, mouthwash).

CAUTIONS

Propolis products can contain flower pollen that may cause allergic reactions in some people. In the past, some propolis products were found to have excessive levels of heavy metals. Confirm purity.

Psyllium

(Plantago ovata)

DESCRIPTION/FUNCTION

Psyllium is native to India and the surrounding countries. The species most often used medicinally is commonly called blond psyllium. The fiber in psyllium is a type of mucilage or gum, consisting mostly of arabinoxylans and galacturonosidorhamnoses. The fiber swells with water, adding bulk to the stool. Some of the fiber can ferment, producing short-chain fatty acids, which benefit the colonocytes.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Seed husks.

MAINTENANCE/THERAPEUTIC RANGE

5 g to 40 g (always consume with sufficient fluid).

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer (colorectal); constipation; diabetes; diarrhea; hemorrhoids; high blood pressure (salt-sensitive); high cholesterol; high triglycerides; irritable bowel syndrome; ulcerative colitis.

COMMENTS

Psyllium fiber swells when combined with fluids. In the stomach, this slows gastric emptying, which helps to regulate blood sugar levels. In the intestines, the fiber increases stool bulk, which is helpful for both constipation and diarrhea.

CAUTIONS

Consult with your health practitioner if you have any kind of intestinal blockage or difficulty swallowing. If you are taking medication for diabetes, you may need to adjust dosage. Psyllium may reduce the absorption of some medications, so take separately if advised. It may have the same absorption effect on dietary minerals (calcium, copper, iron, magnesium, zinc), but some research disputes this.

Pumpkin Seed Oil

(Cucurbita pepo)

DESCRIPTION/FUNCTION

Pumpkins are members of the gourd family, which also contains squash. Pumpkins are native to warmer parts of North America. Active ingredients include fatty acids, cucurbitin, sterols (delta-5-sterols, delta-7-sterols, delta-8-sterols: clerosterol, isofucosterol, sitosterol, stigmasterol, spinasterol), vitamin E (alpha and gamma tocopherol).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Seeds.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 1,500 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Prostate problems.

COMMENTS

Pumpkin seed oil may help reduce the symptoms related to benign prostatic hyperplasia (BPH). Pumpkin seed oil is usually combined with other ingredients that can help with BPH, including saw palmetto and stinging nettle. One component of pumpkin seed oil, cucurbitin, may be beneficial against intestinal worms.

CAUTIONS

None significant.

Pygeum

(Pygeum africanum)

DESCRIPTION/FUNCTION

Pygeum comes from the African plum tree. The tree is a large evergreen native to South Africa. Active ingredients include alcohols (docosanol, tetracosanol), phytosterols (beta-sitosterol, beta-sitosterone), triterpenes (friedelin), triterpenic acids (crataegolic, ferulic, oleanolic, ursolic).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Tree bark.

MAINTENANCE/THERAPEUTIC RANGE

100 mg to 200 mg (standardized to 15% triterpenes, and sometimes 0.5% docosanol).

POSSIBLE THERAPEUTIC APPLICATIONS

Prostate problems.

COMMENTS

Split dose and take twice per day. For benign prostatic hyperplasia (BPH), pygeum is often combined in formulas with saw palmetto, stinging nettle, beta-sitosterol, or pumpkin seed.

CAUTIONS

None known.

Pyruvate

DESCRIPTION/FUNCTION

Pyruvate is an intermediate compound produced during the breakdown of carbohydrates. It is formed near the end of glycolysis and is converted into acetyl CoA, which enters the Krebs cycle. Glycolysis and the Krebs cycle are involved in the metabolism of carbohydrates, amino acids (protein), and lipids (fat). The cycles are responsible for the production of the high-energy molecule, ATP (directly, and indirectly via NADH and the electron transport chain). Note: coenzyme Q10 (CoQ10) is a link in the electron transport chain.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Made in the body and nutritional supplements.

MAINTENANCE/THERAPEUTIC RANGE

2 g to 5 g.

POSSIBLE THERAPEUTIC APPLICATIONS

Obesity.

COMMENTS

Pyruvate is present in small quantities in some food, but not in levels high enough to have an effect. Topical products containing pyruvic acid are used for aging skin. Pyruvate may improve athletic performance by reducing fatigue.

CAUTIONS

Large amounts can cause digestive disturbances.

Quercetin

DESCRIPTION/FUNCTION

Quercetin is classified as a bioflavonoid. It can be formed from rutin when the carbohydrate component of rutin (rutinose) is removed.

DRI (RDA or AI for Adults)

None.

MAJOR SOURCES

Apples, berries, broccoli, grapes (purple and red), onions, red wine, tea (black and green).

MAINTENANCE/THERAPEUTIC RANGE

100 mg to 1,500 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Allergies; bruising; cancer (many kinds); cataracts; coronary heart disease; diabetes (neuropathy, retinopathy); inflammation; prostatitis.

COMMENTS

Quercetin is not soluble in water. Combining with bromelain, an enzyme from pineapples, may increase its absorption. Rutin is more soluble.

CAUTIONS

None significant.

Red Clover

(Trifolium pratense)

DESCRIPTION/FUNCTION

Red clover, a member of the legume family, is native to Europe, central Asia, and northern Africa. It was brought over to North America from Europe to enrich the soil, and for animal feed. Active ingredients include cyanogenic glycosides (linamarin, lotaustralin), isoflavonoids (equol, genistein, daidzein, biochanin A, formononetin), phenolic glycosides (coumarins), volatile oils (benzyl alcohol, phenyl ethanol, methyl salicylate).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Flowers.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 2,000 mg (standardized to 8% isoflavones).

POSSIBLE THERAPEUTIC APPLICATIONS

Coronary heart disease; fibrocystic breasts; menopause; osteoporosis; prostate problems.

COMMENTS

Red clover extracts may decrease female fertility. Because of the estrogen receptors affected (beta, rather than alpha), red clover offers more benefit for osteoporosis than reduction of menopausal symptoms.

CAUTIONS

Avoid if pregnant. Consult with your health practitioner if you have a hormone-sensitive cancer (breast, ovarian, uterine), are taking a blood thinning drug, or any hormones, including those for birth control.

Red Yeast Rice

DESCRIPTION/FUNCTION

Red yeast rice extract is a natural source of compounds that have the same properties as do the prescription statin drugs: lovastatin (Mevacor), pravastatin (Pravachol), simvastatin (Zocor). It is manufactured by fermenting rice with the yeast, *Monascus purpureus*. The extract has been used in China for several hundred years as a food coloring and flavoring agent. Besides containing starches and lipids, the primary active ingredients are the monacolins (monacolin K, dihydromonacolin, and moncolin I through VI).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Red yeast rice extract.

MAINTENANCE/THERAPEUTIC RANGE

1,200 mg to 2,400 mg (standardized to 0.4% monacolins).

POSSIBLE THERAPEUTIC APPLICATIONS

High cholesterol; high triglycerides.

COMMENTS

Red yeast rice extract and the prescription statin drugs lower cholesterol levels by inhibiting the enzyme (HMG-CoA reductase) that is a link in the pathway for cholesterol synthesis. NOTE: statin drugs also reduce the body's production of coenzyme Q10 (CoQ10). Take at least 100 mg of CoQ10 if you take red yeast rice extract or a prescription statin drug. The use of these drugs should be a last resort for reducing cholesterol levels.

CAUTIONS

Avoid if pregnant. Do not take with grapefruit juice or niacin (at levels above 1,000 mg). Do not take if you have liver problems. Consult with your health practitioner if you are taking prescription medications.

Reishi Mushroom

(Ganoderma lucidum)

DESCRIPTION/FUNCTION

Reishi is a mushroom native to China, and cultivated in other Asian countries, as well as North America. Medicinal mushrooms have a long history of use in China and Japan. Many of medicinal mushrooms' benefits are attributed to their beta-glucan content. Besides beta-glucan, reishi contains adenosine, sterols (ergosterol), triterpenes (ganoderic acids). Reishi is a non-edible mushroom.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Mushroom (fruiting body).

MAINTENANCE/THERAPEUTIC RANGE

200 mg to 1,000 mg (standardized to 10% polysaccharides and 4% triterpenes).

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer; herpes (types 1 & 2); high blood pressure; high cholesterol; HIV/AIDS; immune function.

COMMENTS

Reishi is often combined with other medicinal mushrooms, including shiitake and maitake.

CAUTIONS

Consult with your health practitioner if you are taking medications to thin the blood or lower blood pressure.

Resveratrol

DESCRIPTION/FUNCTION

Resveratrol is a type of polyphenol called phytoalexin. Phytoalexins are compounds produced by a plant's defense system against stress caused by environmental conditions, insect infestations, and disease.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Japanese knotweed (*Polygonum cuspidatum*), red wine, red grape skin and seeds, mulberries, peanut skins.

MAINTENANCE/THERAPEUTIC RANGE

10 mg to 400 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer; coronary heart disease; herpes (types 1 and 2); immune function.

COMMENTS

Resveratrol exists in both the *cis* and *trans* stereoisomer forms. Grapes contain mostly the *trans* form, while *Polygonum cuspidatum* contains both forms. Resveratrol has slight estrogenic activity. It also has antioxidant properties. Lower doses may be better for anti-aging effects, and higher doses for anti-cancer effects.

CAUTIONS

Consult with your health practitioner if you are taking a blood thinning drug. Because resveratrol has some estrogenic activity, avoid large amounts if you are pregnant or have a hormone-sensitive cancer (breast, ovarian, uterine).

Rhodiola

(Rhodiola rosea)

DESCRIPTION/FUNCTION

Rhodiola, also commonly known as arctic root or golden root, is native to the northern regions of Europe, Scandinavia, and Eastern Siberia. Its medicinal use dates back several thousand years. Active ingredients include glycosides (salidroside, rosavin), polyphenols (tyrasol).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Roots.

MAINTENANCE/THERAPEUTIC RANGE

50 mg to 750 mg (standardized to 2% rosavins).

POSSIBLE THERAPEUTIC APPLICATIONS

Cardiac arrhythmia; coronary heart disease; fatigue; memory loss.

COMMENTS

Rhodiola is classified as an adaptogen. Adaptogens support the body against various stressors and diseases. They also exert a normalizing action on many physiological processes in the body. An adaptogen, for example, may lower the blood pressure for a person who has high blood pressure. On the other hand, someone with low blood pressure may have it raised when they use the same adaptogen. Rhodiola also has antioxidant properties. Some supplements may be standardized to salidroside (1% to 3%) or polyphenols (40%).

CAUTIONS

None known.

Ribose

(D-Ribose)

DESCRIPTION/FUNCTION

Ribose is five-carbon, simple sugar (pentose) found in living cells as a component of RNA (ribonucleic acid). It is also a constituent of metabolically important compounds, including ATP (adenosine triphosphate), ribonucleotides, nucleic acids, and riboflavin (vitamin B2).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Brewer's yeast and nutritional supplements.

MAINTENANCE/THERAPEUTIC RANGE

2 g to 50 g.

POSSIBLE THERAPEUTIC APPLICATIONS

Angina pectoris; coronary heart disease.

COMMENTS

Some studies show that ribose supplementation can improve athletic performance.

CAUTIONS

Consult with your health practitioner if you have diabetes, since ribose can lower blood sugar levels and medication would have to be adjusted.

Rosemary

(Rosmarinus officinalis)

DESCRIPTION/FUNCTION

Rosemary, a member of the mint family, is native to the Mediterranean region. Its needle-shaped leaves are used as a spice in cooking, and in making perfume. Active ingredients include diterpenes (carnosolic acid, isorosmanol, rosmadial, rosmaridiphenol, rosmariquinone), flavonoids (cirsimarin, diosmin, hesperidin, phegopolin), organic acids (carnosic, rosmaric, rosmarinic, ursolic) triterpenes (oleanolic acid), volatile oils (cineole, alpha-pinene, camphor, camphene, borneol, carnosol, caryophyllene, cymene, limonene, linalool, rosmanol, terpineol, verbenone).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Leaves and stems.

MAINTENANCE/THERAPEUTIC RANGE

200 mg to 800 mg (standardized to 6% carnosic acid).

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer; circulation (topical); high blood pressure; infection (bacterial, fungal); liver support.

COMMENTS

Rosemary (carnosol and rosmanol) has antioxidant properties. It is also used in ointments, mouthwashes, and hair care products. Rosemary can be helpful with indigestion. The volatile oil is used in aromatherapy.

CAUTIONS

Avoid if pregnant due to possible uterine stimulant properties. Large amounts of rosemary, especially the oil, are toxic.

Rye Grass Pollen

(Secale cereale)

DESCRIPTION/FUNCTION

Rye is a European grass native to northern Europe and Asia. It was first cultivated 2,000 to 3,000 years ago. Rye is widely cultivated as livestock forage, as a cover crop during the winter, and for lawns. A proprietary rye pollen extract (Cernilton) contains many active ingredients, including cyclic hydroxamic acid, secalosides, phytosterols (beta-sitosterol, campesterol, estrone, fucosterol, stigmasterol), and an assortment of lipids, sugars, vitamins, and minerals.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Rye flower pollen extract.

MAINTENANCE/THERAPEUTIC RANGE

126 mg to 378 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Prostate problems.

COMMENTS

Rye pollen extract is beneficial for various symptoms associated with benign prostatic hyperplasia (BPH). It might also be helpful with prostatitis, and even inhibit prostate cancer growth.

CAUTIONS

None known.

S-Adenosylmethionine

(S-Adenosyl-L-Methionine; SAdMe)

DESCRIPTION/FUNCTION

SAdMe is the first metabolite of the essential amino acid, L-methionine. SAdMe functions primarily as a methyl donor (CH₃), and is involved in the synthesis of nucleic acids (RNA and DNA), polyamines (spermidine, spermine), carnitine, melatonin, creatine, catecholamines (dopamine, norepinephrine, epinephrine), nicotinamide (vitamin B₃), phospholipids (phosphatidylcholine), and glutathione. It is also involved in myelin maintenance and nerve function. SAdMe is produced in the body by combining methionine with ATP (adenosine triphosphate).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Made in the body and supplements.

MAINTENANCE/THERAPEUTIC RANGE

400 mg to 1,600 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Depression; fibromyalgia; HIV/AIDS (myelopathy); liver support; memory loss; osteoarthritis.

COMMENTS

SAdMe can have low bioavailability, but enteric coated tablets increase its absorption. SAdMe is a link in the cycle involving methionine and homocysteine. Required cofactors in this cycle include three vitamins (B₆, B₁₂, folate) and trimethylglycine (betaine anhydrous).

CAUTIONS

Consult with your health practitioner if you are taking medication for depression (to avoid serotonin syndrome). Avoid if you have bipolar disorder or Parkinson's disease.

Saccharomyces Boulardii

DESCRIPTION/FUNCTION

Saccharomyces boulardii is a type of yeast related to baker's yeast (*Saccharomyces cerevisiae*). It is used the same way as other probiotics (*L. acidophilus*, *B. bifidum*) to populate the intestines against pathogenic bacteria. Unlike the lactic acid producing probiotics, *Saccharomyces boulardii* appears to work by producing protein digesting enzymes (proteases) that work against some pathogenic organisms.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Live yeast extract.

MAINTENANCE/THERAPEUTIC RANGE

250 mg to 2,000 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Acne; Crohn's disease; diarrhea.

COMMENTS

Saccharomyces boulardii can be helpful for travelers who might be exposed to contaminated food or water.

CAUTIONS

Consult with your health practitioner if you have an immunodeficiency disease.

Saw Palmetto

(Serenoa repens)

DESCRIPTION/FUNCTION

Saw palmetto is a dwarf palm native to the coastal regions of the southern United States. Native Americans used it to treat urinary tract problems. Active ingredients include fatty acids, flavonoids (isoquercitrin, kaempferol, rhoifolin), lipid alcohols (farnesol, geranylgeraniol, phytol), phytosterols (beta-sitosterol, stigmasterol), triterpenes (cycloartenol, lupeol, lupenone).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Fruit.

MAINTENANCE/THERAPEUTIC RANGE

160 mg to 320 mg (standardized to 85% to 95% fatty acids and sterols).

POSSIBLE THERAPEUTIC APPLICATIONS

Prostate problems.

COMMENTS

For treating benign prostatic hyperplasia (BPH), extracts of saw palmetto are as effective as many prescription medications. Supplements often combine it with pygeum, stinging nettle, pumpkin seed oil, and beta-sitosterol. Saw palmetto may also help with hair loss by reducing dihydrotestosterone (DHT) levels, and bladder infections in men.

CAUTIONS

Avoid if pregnant. Consult with your health practitioner if you are taking a blood thinning drug.

Schisandra

(Schisandra chinensis)

DESCRIPTION/FUNCTION

Schisandra is a woody vine with red berries, native to eastern China, and it has a long history of use by people indigenous to this area. The berries are picked in the fall, steamed, and then dried. Schisandra was traditionally used as an energy food. In traditional Chinese medicine (TCM), it is used for many ailments. Active ingredients include lignans (gomisins, pregomisin, schizandrins, schizandrols, wuweizisus), volatile oils (chamigrene, chamigrenal, sesquicarene, ylangene).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Fruit (berries).

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 2,000 mg (concentrated extract).

POSSIBLE THERAPEUTIC APPLICATIONS

Liver support (hepatitis).

COMMENTS

Schisandra has been called an adaptogen, helping the body to resist stress, and having a general normalizing effect. It has been used as a performance enhancing aid for physical activities, as well as helping with concentration. Schisandra also seems to have antioxidant and anti-inflammatory properties.

CAUTIONS

Avoid if pregnant.

Selenium

DESCRIPTION/FUNCTION

Selenium is classified as a trace mineral. It may be essential for tissue respiration; associated with fat metabolism, vitamin E, and antioxidant functions (as part of the enzyme, glutathione peroxidase).

DRI (RDA or AI for Adults)

Adults: 55 mcg.

Pregnancy: 60 mcg. Lactation: 70 mcg.

MAJOR SOURCES

Brazil nuts, oysters, liver, seafood, sardines, whole grains.

MAINTENANCE/THERAPEUTIC RANGE

100 mcg to 400 mcg.

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer (prostate); coronary heart disease; HIV/AIDS; immune function; osteoarthritis.

COMMENTS

Selenium works well with vitamin E.

CAUTIONS

None significant. Keep intake well below 1,000 mcg if taken daily for long periods of time.

Senna

(*Cassia acutifolia*; *Cassia angustifolia*; *Cassia senna*)

DESCRIPTION/FUNCTION

Senna comes from the genus, *Cassia*, which is a member of the legume family. There are about 500 species of cassia, found in tropical and subtropical regions around the world. Senna comes primarily from three species, *Cassia acutifolia*, *Cassia angustifolia*, and *Cassia senna*. The use of senna as a laxative goes back more than a thousand years, with the first recorded use by Arabs. Active ingredients include anthraquinones (sennosides A to D) and naphthacene derivatives.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Leaves and fruit.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 1,500 (providing 10 mg to 40 mg of sennosides).

POSSIBLE THERAPEUTIC APPLICATIONS

Constipation.

COMMENTS

Try to find products made from the fruit, which is more gentle than the leaf. Using the proper amount of senna will usually produce an effect (soft stool) between 8 and 12 hours. Do not use a laxative for more than a week or two. If the problem persists, increase water and fiber intake, take magnesium, and increase exercise.

CAUTIONS

Consult with your health practitioner if you are pregnant, or are taking any kind of heart medication.

Serrapeptase

DESCRIPTION/FUNCTION

Serrapeptase is a peptidase enzyme produced by the silkworm to break down its cocoon. (Peptidases are proteolytic enzymes, facilitating the digestion of proteins.) Serrapeptase reduces the viscosity of mucus by breaking down the proteins in it, making it easier for its elimination.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Silkworms.

MAINTENANCE/THERAPEUTIC RANGE

10 mg to 30 mg in enteric-coated tablets.

POSSIBLE THERAPEUTIC APPLICATIONS

Inflammation; sinusitis.

COMMENTS

Serrapeptase is sometimes used before and after some surgeries to reduce postoperative swelling. It may also be helpful for various inflammatory conditions (e.g., bronchitis, laryngitis) of the respiratory tract. Usually serrapeptase is used for short periods of time.

CAUTIONS

None known.

Shiitake Mushroom

(Lentinus edodes)

DESCRIPTION/FUNCTION

Shiitake is a mushroom native to eastern Asia. Medicinal mushrooms have a long history of use in China and Japan. Many of medicinal mushrooms' benefits are attributed to their beta-glucan content. The beta-glucan in shiitake is called lentinan. Besides beta-glucan, shiitake contains other active polysaccharides, including emitan and KS-2 (Kirin-Seagram-2). Shiitake is an edible mushroom.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Mushroom (fruiting body).

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 10,000 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer; immune function; infection.

COMMENTS

There is a water-soluble extract of shiitake called Lentinus Edodes Mycelia extract (LEM extract). It is produced before the fruiting body of the mushroom has formed, and it may be more potent than regular shiitake. Shiitake is often combined with other medicinal mushrooms, including reishi and maitake.

CAUTIONS

Avoid large quantities if pregnant. Consult with your health practitioner if you have cancer. Shiitake has caused eosinophilia (increase in granular white blood cells) in some individuals. Limit time of use to a month or two.

Silicon

DESCRIPTION/FUNCTION

Silicon is classified as a trace mineral. It is a brittle, nonmetallic element that makes up about 30 percent of the earth's crust. Its oxide form, silicon dioxide, is the principal constituent of sand. Food sources are mostly of plant origin, and include whole grains and root vegetables. The forms found in the diet include silica, monosilicic acid, phytoliths, and silicon bound to pectin and mucopolysaccharides. Western diets provide somewhere between 15 mg and 60 mg of silicon per day. In the body, most silicon is found in connective tissues, including bone, cartilage, tendon, hair, nails, and skin.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Whole grains, root vegetables, beer, coffee.

MAINTENANCE/THERAPEUTIC RANGE

5 mg to 50 mg, usually from *Equisetum arvense* (horsetail herb) or orthosilicic acid.

POSSIBLE THERAPEUTIC APPLICATIONS

Coronary heart disease; osteoporosis.

COMMENTS

Supplementation with silicon may reduce brittle hair and nails. Supplements using horsetail herb usually contain 7% silicon, so a 500 mg tablet would provide 35 mg of silicon.

CAUTIONS

None significant, but until more is known, try not exceed about 50 mg per day.

Skullcap

(Scutellaria lateriflora)

DESCRIPTION/FUNCTION

Skullcap (also spelled scullcap) is a member of the mint family. It is native to North America and cultivated in Europe. Active ingredients include flavonoids and glycosides (baicalein, baicalin, catalpol, chrysin, isoscutellarein, scutellarein, scutellarin, wogonin, wogonoside), lignins, resins, tannins, volatile oils.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Above ground (aerial) parts of the plant.

MAINTENANCE/THERAPEUTIC RANGE

1 g to 5 g.

POSSIBLE THERAPEUTIC APPLICATIONS

Anxiety; inflammation; insomnia.

COMMENTS

Research on Chinese skullcap (*Scutellaria baicalensis*) root shows similar properties, plus possible benefits for treating parasitic and viral infections, as well as treating cancer. For insomnia, skullcap is often combined with other herbs (catnip, hops, passionflower, valerian).

CAUTIONS

None significant, but do not use while driving or doing any activity that requires fine motor skills or judgement.

Slippery Elm

(Ulmus fulva; Ulmus rubra)

DESCRIPTION/FUNCTION

Slippery elm is a small elm tree native to North America. Native Americans had a variety of uses for this plant, both medicinally and for making products, such as baskets. Active ingredients include carbohydrates (mucilages), steroids (campesterol, beta-sitosterol), sesquiterpenes.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Inner bark.

MAINTENANCE/THERAPEUTIC RANGE

1 g to 20 g.

POSSIBLE THERAPEUTIC APPLICATIONS

Heartburn; sore throat.

COMMENTS

The mucilages in the inner bark of slippery elm have a coating and soothing effect on mucous membranes, partially by increasing mucus production. Slippery elm is often used as lozenges. It is also available in topical creams and ointments for a variety of skin ailments.

CAUTIONS

The inner bark is safe, but the whole bark should be avoided, especially by pregnant women (the whole bark contains abortifacients).

Soy Isoflavonoids

(Daidzein; Genistein; Ipriflavone)

DESCRIPTION/FUNCTION

Soy isoflavonoids are part of the larger class of bioflavonoids. The isoflavonoids are also classified as phytoestrogens, since they can bind to estrogen receptors. Isoflavonoids are also found in other plants, including kudzu and red clover.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Soy products (beans, milk, natto, tempeh, tofu).

MAINTENANCE/THERAPEUTIC RANGE

Daidzein/Genistein: 25 mg to 200 mg.

Ipriflavone: 200 mg to 600 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer (especially daidzein and genistein); high cholesterol; menopause; osteoporosis (especially ipriflavone).

COMMENTS

For osteoporosis, ipriflavone should be combined with calcium and vitamin D. Soy contains much more than these three isoflavonoids, so it is difficult to pinpoint exactly which is doing what. Overall, it is probably better to consume whole soy products, rather than be limited to one or two active components.

CAUTIONS

Avoid if pregnant. Consult with your health practitioner if you have a hormone-sensitive cancer (breast, ovarian, uterine), or are taking medications. There is some concern that soy products may affect people with thyroid problems, especially underactive thyroid (hypothyroidism).

Spirulina

(*Spirulina maxima*; *Spirulina platensis*)

DESCRIPTION/FUNCTION

The spirulina used in supplements comes from two species of cyanobacteria, a type of blue-green algae. Its color comes from chlorophyll (green pigment) and c-phycoyanin (blue pigment). Spirulina is grown commercially in large alkaline ponds, mostly in Mexico, Central America, and South America. It is consumed by humans and livestock, and is added to soil for enrichment. Spirulina is high in protein (60% to 70%), and also contains carotenoids, vitamins, minerals, and essential fatty acids.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Blue-green algae.

MAINTENANCE/THERAPEUTIC RANGE

1 g to 5 g.

POSSIBLE THERAPEUTIC APPLICATIONS

Immune function.

COMMENTS

Spirulina contains vitamin B-12, but in a form that is not bioavailable to humans. Spirulina may help to reduce cholesterol levels. It also has some antioxidant and anti-inflammatory properties.

CAUTIONS

Avoid if pregnant, unless the supplement is confirmed to be contaminant free. Do not confuse spirulina with other blue-green algae (e.g., *Aphanizomenon flos-aquae*), which are more likely to contain toxic contaminants.

St. John's Wort

(Hypericum perforatum)

DESCRIPTION/FUNCTION

St. John's Wort is native to subtropical and temperate regions worldwide, including Europe, western Asian, and northern Africa. The plant was named after St. John the Baptist, because its flowers bloom around the time of his birth (June 24th). For many centuries, the plant's flowers were used to heal wounds, and to treat depression, anxiety, and insomnia. Active ingredients include anthracene derivatives (hypericin, pseudohypericin), acylphloroglucinols (hyperforin), flavonoids (amentoflavone, hyperoside, isoquercitrin, quercitrin, rutin), lipids (alpha-pinene, beta-pinene, limonene, caryophyllen, humulene, beta-sitosterol), organic acids (caffeic, chlorogenic, genistic, ferulic).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Plant flowers (mostly) and leaves.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 1,000 mg (standardized to 0.2% to 0.3% hypericin or 2% to 3% hyperforin).

POSSIBLE THERAPEUTIC APPLICATIONS

Anxiety; depression; premenstrual syndrome.

COMMENTS

Research supports this herb's use for mild to moderate depression, and possibly major depression. St. John's wort can be applied topically (cream, ointment) to reduce inflammatory skin conditions (dermatitis), and to treat minor wounds and burns. It may also be helpful against various bacterial and viral infections. Some people with obsessive-compulsive disorder (OCD) may benefit from using St. John's wort.

CAUTIONS

Avoid if pregnant. Consult with your health practitioner if you are taking any kind of medication, including antidepressants, blood thinners, birth control pills, heart medication, transplant drugs, or asthma medication. St. John's wort may increase photosensitivity, so limit exposure to the sun while taking it.

Starch Blocker

(White Kidney Bean Extract)

DESCRIPTION/FUNCTION

Starch blocker supplements are made from an extract of white kidney bean (*Phaseolus vulgaris*). The extract contains alpha-amylase inhibitors. (Amylase is the enzyme that breaks down starch into sugar.) The claim is that if the starch is not digested, it will pass through the GI tract intact, and thus not be a source of calories.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

White kidney beans.

MAINTENANCE/THERAPEUTIC RANGE

1,500 mg to 3,000 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Obesity.

COMMENTS

Starch blockers were popular in the 1980s, but they were not effective for weight loss. A new product that is more concentrated is now available (Phase 2), and it may offer modest help in losing weight, especially if the obesity is due to excess carbohydrate (starch) intake.

CAUTIONS

Consult with your health practitioner if you are diabetic, since you may have to adjust your medication.

Stinging Nettle

(*Urtica dioica*)

DESCRIPTION/FUNCTION

Stinging nettle is found in most temperate regions around the world. The stems and leaves have hollow hairs filled with a stinging liquid that can produce a burning sensation on the skin. The sting usually lasts only a few minutes. Active ingredients include hydroxycoumarins (scopoletin), lectins (*Urtica dioica* agglutinin), polyphenols (isoquercitrin, isorhamnetin, kaempferol, quercetin, rutin), polysaccharides (glucans, glucogalacturonans, arabinogalactans), steroids (beta-sitosterol, campesterol, stigmasterol).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Aerial parts (flowers and leaves) and root.

MAINTENANCE/THERAPEUTIC RANGE

250 mg to 1,000 mg (standardized to 1% to 2% silicon).

POSSIBLE THERAPEUTIC APPLICATIONS

Osteoarthritis (leaves); prostate problems (root); urinary tract infections (leaves).

COMMENTS

Stinging nettle root shows benefits for reducing some symptoms associated with benign prostatic hyperplasia (BPH). However, usually it is combined with several other ingredients, including saw palmetto, pygeum, or pumpkin seed oil. Stinging nettle leaves may be helpful for urinary tract infections and osteoarthritis.

CAUTIONS

Leaves: avoid if pregnant. Consult with your health practitioner if you have diabetes or hypertension. Root: none significant.

Strontium

DESCRIPTION/FUNCTION

Strontium is classified as a trace mineral. It belongs to the same group (periodic table) as magnesium and calcium. In the body, strontium has similarities to calcium. Food tables do not list it, so good food sources are unknown. Supplemental strontium is not radioactive.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Nutritional supplements.

MAINTENANCE/THERAPEUTIC RANGE

400 mg to 800 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Osteoporosis.

COMMENTS

Recent research used strontium ranelate to treat bone loss, but other forms of strontium are also helpful. One supplier of strontium carbonate recommends that it be taken on an empty stomach, away from calcium.

CAUTIONS

None significant, but Consult with your health practitioner if you have kidney disease.

Suma

(Pfaffia paniculata)

DESCRIPTION/FUNCTION

Suma is a vine native to the Amazon river basin and to other tropical regions of Latin America. It is sometimes called Brazilian ginseng. Active ingredients include nortriterpene (pfaffic acid), saponins (pfaffosides), steroids (beta-ecdysterone), sterols (beta-sitosterol, stigmasterol).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Roots.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 2,000 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

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COMMENTS

Little research has been conducted on suma, other than *in vitro* (test tube) or on animals. It may have some anti-inflammatory properties, and may also benefit the immune system.

CAUTIONS

None known.

Superoxide Dismutase

(SOD)

DESCRIPTION/FUNCTION

Superoxide is an oxygen molecule that gained an extra electron. Superoxide molecules are free radicals that can attack various biological molecules, including fats, proteins, and nucleic acids. Superoxide dismutase is an enzyme composed of metal-containing proteins that converts the superoxide radical into somewhat less destructive hydrogen peroxide. Hydrogen peroxide, in turn, is deactivated by catalase, producing water and oxygen.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Made in the body and nutritional supplements.

MAINTENANCE/THERAPEUTIC RANGE

1,000 to 3,000 SOD units.

POSSIBLE THERAPEUTIC APPLICATIONS

Osteoarthritis; rheumatoid arthritis.

COMMENTS

Most research has been done on animal-source SOD. However, there is some concern that these sources (animal organs) may be contaminated with bovine spongiform encephalitis (mad cow disease). SOD is often given by injection, since the oral form may not absorb well. Some companies produce SOD that is enteric-coated, and claim that more is absorbed. SOD is composed of one of three metals: copper, manganese, or zinc. Copper bracelets may work by allowing the copper to be absorbed into the skin and producing more copper-based SOD.

CAUTIONS

None known from vegetable-source SOD.

Taurine

DESCRIPTION/FUNCTION

Taurine is a non-essential, sulfur-containing amino acid. It is a derivative of cysteine, made in the liver, and concentrated in muscle and the central nervous system (CNS). Unlike most amino acids, taurine is not involved in protein synthesis. It protects the retina via antioxidant properties. In the liver and intestines, taurine functions as a bile salt (taurocholate), and in the CNS as an inhibitory neurotransmitter.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Animal protein (meat and fish) and human breast milk.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 10,000 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Cardiac arrhythmia; congestive heart failure; coronary heart disease; cystic fibrosis; diabetes; high blood pressure; liver support (hepatitis).

COMMENTS

While taurine is not essential for adults, it is added to infant formulas to protect their retinas. (It is essential for cats, protecting their eyes and heart.) Research done in the 1970s showed that taurine may help reduce epileptic seizures. For diabetes, taurine may potentiate insulin, as well as protect against some diabetic complications, including retinopathy.

CAUTIONS

None known.

Tea Tree Oil

(Melaleuca alternifolia)

DESCRIPTION/FUNCTION

Melaleuca is native to Australia. It has a long history of use by the Aborigines in treating various skin problems. Active ingredients include a variety of terpenes (terpinene-4-ol, alpha-terpinene, gamma-terpinene, cineole, alpha-terpineol, limonene).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Leaves.

MAINTENANCE/THERAPEUTIC RANGE

Sufficient amount to cover the area. Oils, creams, and gels range from 100% tea tree oil down to 5%.

POSSIBLE THERAPEUTIC APPLICATIONS

Acne; skin infections (bacterial, fungal).

COMMENTS

Topical preparations of melaleuca have been used to treat fungal toenail infections, athlete's foot, vaginal infections (bacterial and yeast), dandruff, and gum infections (gingivitis).

CAUTIONS

Do not use internally, only apply topically. Test with weaker products and try over small areas of skin first.

Theanine

(L-Theanine)

DESCRIPTION/FUNCTION

Theanine is a non-essential amino acid found in green tea (*Camellia sinensis*). Unlike most amino acids, theanine is not involved in protein synthesis. It is a derivative of the amino acid, glutamic acid (glutamate).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Green tea leaves.

MAINTENANCE/THERAPEUTIC RANGE

100 mg to 500 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Anxiety; cancer; coronary heart disease; high blood pressure; premenstrual syndrome.

COMMENTS

Theanine enhances the effectiveness of some chemotherapeutic drugs (adriamycin, doxorubicin, idarubicin) in treating cancer. Excessive levels of the excitatory neurotransmitter, glutamic acid, can damage nerve cells. Theanine can protect against this damage.

CAUTIONS

If you have cancer, do not take without first consulting with your oncologist. Consult with your health practitioner if you are taking medication for cancer or high blood pressure.

Thymus Extract

DESCRIPTION/FUNCTION

The thymus is a bilobed gland located behind the sternum (breast bone) and between the lungs. It is responsible for producing hormones (thymosin, thymic humoral factor, thymic factor, thymopoietin) that promote the maturation of immune system T cells (special white blood cells). It is at its greatest weight at puberty, and after that gradually loses mass, some of it being replaced with adipose tissue (fat).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Animal thymus glandular extract (usually bovine).

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 1,500 mg (crude extract).

POSSIBLE THERAPEUTIC APPLICATIONS

Allergies; asthma; common cold; hepatitis; HIV/AIDS; immune function.

COMMENTS

Research is often conducted using a concentrated form of thymus extract called Thymomodulin, a pharmaceutical grade extract. The amounts used are lower (120 mg/day), and can be given by injection.

CAUTIONS

Consult with your health practitioner if you are taking immunosuppressive medication. Ensure that the source of the glandular extract comes from uncontaminated animals. The extract should come from young animals (calves) raised in countries with no record of BSE (mad cow disease).

Tocotrienols

(Alpha-, Beta-, Gamma-, Delta-Tocotrienol)

DESCRIPTION/FUNCTION

The vitamin E family contains eight members, in two groups: tocopherols (alpha, beta, gamma, delta) and tocotrienols (alpha, beta, gamma, delta). Like the tocopherols, the tocotrienols have antioxidant properties. Unlike the tocopherols, the tocotrienols can lower the body's production of cholesterol.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Palm and rice bran oils. Also found in legumes and cereal grains, especially the bran and germ sections.

MAINTENANCE/THERAPEUTIC RANGE

25 mg to 200 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer; coronary heart disease; high cholesterol.

COMMENTS

Tocotrienol supplements may contain a mix of the four forms (alpha, beta, gamma, and delta), as well as some tocopherols. Tocotrienol supplements derived from palm oil contain a wider range of tocotrienols than those from rice brain oil, which contains primarily gamma tocotrienol. The delta and gamma forms show greater activity for inhibiting cholesterol production.

CAUTIONS

Consult with your health practitioner if you are taking blood thinning medication, have a bleeding disorder, or have suffered a recent stroke (hemorrhagic).

Tribulus Terrestris

(Tribulus terrestris)

DESCRIPTION/FUNCTION

Tribulus has a long history of use, from China to India. It is also called puncture vine because it is a ground-hugging plant with sharp spines. For centuries, tribulus was used as a general energizer, and more specifically, to increase sexual energy. In the 1970s and 1980s, the Bulgarian government authorized research into its energy-enhancing properties for its Olympic weight lifting team, which was successful. Bodybuilders in the U.S. also use tribulus. Active ingredients include phytosterols (beta-sitosterol) and steroidal saponins (dioscin, protodioscin, diosgenin).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Leaves.

MAINTENANCE/THERAPEUTIC RANGE

250 mg to 1,500 mg (may be standardized to a percentage of steroidal saponins).

POSSIBLE THERAPEUTIC APPLICATIONS

Erectile dysfunction; infertility (male).

COMMENTS

Most research using tribulus has been done on animals, but some human research shows it may be helpful for angina, and male infertility and impotence. It may not directly stimulate muscle growth, but it may increase energy and endurance. Use of tribulus may also elevate mood.

CAUTIONS

Avoid if pregnant; it may have abortifacient properties.

Tryptophan

(L-Tryptophan)

DESCRIPTION/FUNCTION

Tryptophan is classified as an essential amino acid. It is necessary for normal growth in infants, and for nitrogen balance in adults. Tryptophan can be converted into several substances, including 5-HTP (5-hydroxytryptophan) and the inhibitory neurotransmitter, serotonin. Serotonin is then converted to the hormone, melatonin. Tryptophan can be converted into the B-vitamin, niacin (60 mg tryptophan = 1 mg niacin). Tryptophan is also converted to picolinic acid, which can help with chromium and zinc absorption.

DRI (RDA or AI for adults)

3.5 mg/kg/day.

MAJOR SOURCES

Protein foods, especially legumes, grains, and seeds.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 2,000 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Depression; fibromyalgia; insomnia; premenstrual syndrome.

COMMENTS

Tryptophan used to be difficult to obtain, and most people had switched to 5-HTP instead. That was because one contaminated batch produced by a Japanese manufacturer in 1989 resulted in more than 1,000 cases of eosinophilia-myalgia syndrome. Consequently, the FDA had restricted the sale of tryptophan. However, tryptophan is available again, and some vitamin companies are now selling it. As a sleep aid, it should be taken 30 min. to 45 min. before bed. It works better when taken with a simple carbohydrate (for example, fruit juice) and a small amount of vitamin B6. As with all amino acids, supplements should be taken on an empty stomach, or at least separate from protein foods.

CAUTIONS

Avoid if pregnant. Consult with your health practitioner if you are taking medication for depression.

Turkey Tail Mushroom

(Coriolus versicolor)

DESCRIPTION/FUNCTION

Coriolus mushroom was used as a folk medicine in Asia for many years. Within the last decade, it has been the subject of considerable research, especially in Japan. As with other medicinal mushrooms (maitake, reishi, shiitake), it contains polysaccharides called beta-glucans. Coriolus contains two polysaccharides that have been isolated and researched in clinical studies. One is polysaccharide krestin (PSK) and the other is polysaccharide peptide (PSP). These polysaccharides are used as biological response modifiers (BRM). (BRMs are substances that can improve the body's natural response to infection and disease. There are four major groups: bacterial products, synthetic molecules, cytokines, and hormones.) Coriolus mushroom has antimicrobial, antitumor, and antiviral properties.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Mushroom fruiting body and mycelium.

MAINTENANCE/THERAPEUTIC RANGE

1 g to 3 g (standardized to 35% polysaccharides).

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer (colon, lung, stomach); HIV/AIDS.

COMMENTS

Purified extracts are usually used in cancer therapy. These products are quite expensive. Coriolus may be used by itself, or combined with other cancer therapies.

CAUTIONS

None known.

Turmeric

(Curcuma longa)

DESCRIPTION/FUNCTION

Turmeric (also spelled tumeric) is a member of the ginger family. It contains a variety of bioactive substances called curcuminoids. The most active component is curcumin, an orange-yellow volatile oil that includes three curcuminoids: turmerone, atlantone, and zingiberone.

DRI (RDA or AI for Adults)

None.

MAJOR SOURCES

Rhizome. Used as a spice in prepared mustard and curry.

MAINTENANCE/THERAPEUTIC RANGE

100 mg to 2,000 mg (standardized to 95% curcumin or curcuminoids).

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer (colorectal); cataracts; coronary heart disease; HIV/AIDS; inflammation; rheumatoid arthritis; wound healing.

COMMENTS

Turmeric has good antioxidant activity, comparing well with vitamin C, vitamin E, and superoxide dismutase.

CAUTIONS

Avoid if pregnant (large doses may stimulate the uterus). Consult with your health practitioner if you have gallstones, or are taking blood thinning drugs.

Tyrosine

(L-Tyrosine)

DESCRIPTION/FUNCTION

Tyrosine is classified as a nonessential amino acid. It can be converted from the essential amino acid, L-phenylalanine. Tyrosine is converted to the excitatory catecholamine neurotransmitters (dopa, dopamine, norepinephrine, epinephrine), thyroid hormones, and melanin (skin pigment).

DRI (RDA or AI for adults)

Phenylalanine plus tyrosine: 14 mg/kg/day.

MAJOR SOURCES

Protein foods.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 4,000 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Depression; fatigue.

COMMENTS

Tyrosine, when combined with kelp (iodine source), may help with hypothyroidism. It may also be helpful with memory function by increasing alertness and concentration. Tyrosine has been used as an aid in reducing drug dependency (amphetamine, cocaine). The U.S. Army has experimented with tyrosine to reduce fatigue under simulated battlefield conditions. Some people may not efficiently convert phenylalanine into tyrosine, so may benefit from supplemental tyrosine. As with all amino acids, supplements should be taken on an empty stomach, or at least separate from protein foods.

CAUTIONS

Avoid if you have hyperthyroidism, melanoma, or Grave's disease. Consult with your health practitioner if you are taking a MAO inhibitor (MAOI), or have high blood pressure.

Uva Ursi

(Arctostaphylos uva-ursi)

DESCRIPTION/FUNCTION

Uva ursi, also commonly known as bearberry, is an evergreen shrub native to northern Eurasia, but is cultivated in many other areas, including North America. Active ingredients include flavonoids (quercitrin, isoquercitrin, myricetin), hydroquinone glycosides (arbutin), monotropein, phenol carboxylic acids (gallic, p-coumaric, caffeic, ferulic), tannins (corilagin, delphinidin, proanthocyanidins).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Leaves.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 1,500 mg (standardized to 20% arbutin).

POSSIBLE THERAPEUTIC APPLICATIONS

Urinary tract infections.

COMMENTS

Uva ursi has antiseptic, astringent, anti-inflammatory, and diuretic properties.

CAUTIONS

Avoid if pregnant. Do not take if you have kidney or liver problems. Do not take with prescription diuretics. Uva ursi is a potent herb and should only be used for short periods of time (a week or two).

Valerian

(Valeriana officinalis)

DESCRIPTION/FUNCTION

Valerian is a shrub native to the northern temperate regions of Europe and Asia, and cultivated in the U.S. The root has a smell that reminds one of unwashed gym socks. Active ingredients include chlorogenic acid, iridoids (isovaltrate, valepotriate), monoterpenes (borneol), pyridine alkaloids (valerianine), sesquiterpenes (valerenic acid), volatile oils (isovalerenate).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Roots.

MAINTENANCE/THERAPEUTIC RANGE

200 mg to 400 mg (standardized to 0.8% to 1.0% valerenic acid).

POSSIBLE THERAPEUTIC APPLICATIONS

Anxiety; insomnia.

COMMENTS

Valerian increases the inhibitory neurotransmitter, GABA. For insomnia, valerian is often combined with other herbs, including catnip, chamomile, hops, passionflower, and skullcap.

CAUTIONS

Avoid if you have liver problems. Do not use while driving or doing any activity that requires fine motor skills or judgement. Do not combine with alcohol or other recreational drugs. Do not use if you are taking various medications, including antidepressants and tranquilizers.

Vanadium

DESCRIPTION/FUNCTION

Vanadium is classified as a trace mineral. Apparent role may be in lipid metabolism or reproductive performance. It appears to mimic the action of insulin.

DRI (RDA or AI for Adults)

None.

MAJOR SOURCES

Very little is found in food, but some sources include shellfish, spinach, parsley, mushrooms, whole grains.

MAINTENANCE/THERAPEUTIC RANGE

10 mcg to 1,000 mcg.

POSSIBLE THERAPEUTIC APPLICATIONS

Diabetes.

COMMENTS

Vanadium seems to have some of the properties of insulin. Unfortunately, the amounts sometimes needed to be effective for diabetes approach toxic levels. Vanadyl sulfate is the form most often used in nutritional supplements.

CAUTIONS

None significant, but avoid if you have kidney problems.

Vinpocetine

DESCRIPTION/FUNCTION

Vinpocetine is a derivative of the extract, vincamine, which in turn comes from the lesser periwinkle plant (*Vinca minor*). The plant is a native of many parts of Europe, from Spain to the Caucasus mountains. In Europe, vinpocetine is considered a drug, and is usually available only by prescription.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Nutritional supplements.

MAINTENANCE/THERAPEUTIC RANGE

5 mg to 30 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Memory loss; stroke (ischemic).

COMMENTS

Vinpocetine increases blood flow to the brain, and has a protective effect on the brain's nerve cells (neurons), especially against excitatory amino acids, such as glutamic acid. It also exhibits antioxidant properties. Vinpocetine may also benefit the eyes (wound healing) and hearing (tinnitus, vertigo).

CAUTIONS

Avoid if pregnant. Consult with your health practitioner if you are taking a blood thinning drug. Vinpocetine may cause transitory low blood pressure, and care should be taken if you normally have low blood pressure (hypotension).

Vitamin A

(Retinol; Retinal)

DESCRIPTION/FUNCTION

Vitamin A is classified as a fat-soluble vitamin. Essential for normal growth, development, and maintenance of epithelial tissue; essential to the integrity of night vision; helps provide for normal bone development; influences normal tooth formation; necessary for wound healing; toxic in large quantities.

DRI (RDA or AI for Adults)

Males: 900 mcg RAE (2,997 IU).

Females: 700 mcg RAE (2,331 IU).

Pregnancy: 770 mcg RAE (2,564 IU).

Lactation: 1,300 mcg RAE (4,329 IU).

RAE = Retinol Activity Equivalents.

1 RAE = 1 mcg retinol. 1 RAE = 3.33 IU.

MAJOR SOURCES

Liver and cod liver oil. (See Beta-Carotene for non-animal sources.)

MAINTENANCE/THERAPEUTIC RANGE

5,000 IU to 25,000 IU (upper range for short periods of time).

CAUTION: Pregnant women should not exceed 10,000 IU.)

POSSIBLE THERAPEUTIC APPLICATIONS

Acne; cancer (breast, lung); cataracts; immune function; psoriasis.

COMMENTS

Nutritional supplements usually use vitamin A acetate or palmitate. If beta-carotene is listed as the source of vitamin A, make sure it is derived from natural sources.

CAUTIONS

To avoid potential birth defects, pregnant women should not exceed 10,000 IU (3,000 mcg RAE) daily total from all sources. Most adults (pregnant women excluded) can tolerate large doses of retinol for short periods of time. However, for prolonged intake, it is best to keep vitamin A intake well below 25,000 IU.

Vitamin B1

(Thiamin)

DESCRIPTION/FUNCTION

Thiamin is classified as a B-vitamin. Combines with phosphorus to form thiamin pyrophosphate (TPP) necessary for metabolism of protein, carbohydrate, and fat; essential for growth, normal appetite, digestion, and healthy nerves.

DRI (RDA or AI for Adults)

Males: 1.2 mg. Females: 1.1 mg.

Pregnancy/Lactation: 1.4 mg.

MAJOR SOURCES

Brewer's yeast, pork, ham, nuts, legumes.

MAINTENANCE/THERAPEUTIC RANGE

10 mg to 500 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Alcoholism; cataracts; memory loss.

COMMENTS

Alcoholics are at greatest risk for developing a B1 deficiency.

CAUTIONS

None known.

Vitamin B2

(Riboflavin)

DESCRIPTION/FUNCTION

Riboflavin is classified as a B-vitamin. Essential for growth; plays an enzymatic role in tissue respiration and acts as a transporter of hydrogen ions. Coenzyme forms are FMN (flavin mononucleotide) and FAD (flavin adenine dinucleotide).

DRI (RDA or AI for Adults)

Males: 1.3 mg. Females: 1.1 mg.
Pregnancy: 1.4 mg. Lactation: 1.6 mg.

MAJOR SOURCES

Liver, almonds, brewer's yeast, dairy products, green leafy vegetables, eggs.

MAINTENANCE/THERAPEUTIC RANGE

10 mg to 400 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Cataracts; headache (migraine).

COMMENTS

Riboflavin has some antioxidant properties and may work with vitamin E. Riboflavin is the vitamin that can give urine a strong yellow-orange color.

CAUTIONS

None significant.

Vitamin B3

(Niacin or Nicotinic Acid; Niacinamide or Nicotinamide)

DESCRIPTION/FUNCTION

Niacin and niacinamide are classified as B-vitamins. As part of enzyme system (nicotinamide adenine dinucleotide, NAD), aids in transfer of hydrogen and acts in metabolism of carbohydrates and amino acids; involved in glycolysis, fat synthesis and breakdown, and tissue respiration.

DRI (RDA or AI for Adults)

Males: 16 mg NE. Females: 14 mg NE.

Pregnancy: 18 mg NE. Lactation: 17 mg NE.

NE = niacin equivalent. 1 mg niacin = 60 mg tryptophan.

MAJOR SOURCES

Liver, peanuts, poultry, fish, brewer's yeast, beef, pork, sunflower seeds, almonds.

MAINTENANCE/THERAPEUTIC RANGE

50 mg to 3,000 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Cataracts; coronary heart disease (niacin); diabetes (niacinamide); high cholesterol (niacin); high triglycerides (niacin); memory loss; osteoarthritis (niacinamide); poor circulation (especially inositol hexanicotinate).

COMMENTS

Niacin can cause capillary dilation, producing a flushing in the face and chest. Starting at low doses, and taken with meals, reduces flushing. Also, if taken regularly, flushing will decrease and dosage can be increased. The timed release form of niacin reduces flushing, but at high doses (over 1,000 mg) increases the risk of liver problems (hepatotoxicity). The niacinamide form does not cause flushing, but will not reduce cholesterol levels. Another form of niacin, inositol nicotinate (also inositol hexanicotinate or hexaniacininate), does not produce the flushing.

CAUTIONS

Consult with your health practitioner if you have diabetes, glaucoma, gout, impaired liver function, ulcers, or are taking medications (especially for diabetes, high cholesterol, or high blood pressure).

Vitamin B5

(Pantothenic Acid; Pantothenate)

DESCRIPTION/FUNCTION

Pantothenic acid is classified as a B-vitamin. As part of coenzyme A and other derivatives, pantothenic acid participates in energy release from protein, carbohydrate, and fat; required in the biosynthesis of fatty acids.

DRI (RDA or AI for Adults)

Adults: 5 mg.

Pregnancy: 6 mg. Lactation: 7 mg.

MAJOR SOURCES

Liver, nuts and seeds, lowfat yogurt, salmon, brewer's yeast, turkey, chicken, peanuts, avocado, oysters, bass, beef heart, herring, mushrooms. Possibly synthesized by intestinal bacteria.

MAINTENANCE/THERAPEUTIC RANGE

50 mg to 2,000 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

High cholesterol (pantethine); rheumatoid arthritis.

COMMENTS

Pantethine is a derivative of pantothenic acid.

CAUTIONS

High doses can have a laxative effect.

Vitamin B6

(Pyridoxine; Pyridoxal; Pyridoxamine)

DESCRIPTION/FUNCTION

Pyridoxine is classified as a B-vitamin. As a coenzyme, it aids in the synthesis and breakdown of amino acids and in the synthesis of unsaturated fatty acids from essential fatty acids; essential for conversion of tryptophan to niacin; essential for normal growth.

DRI (RDA or AI for Adults)

Under age 51: 1.3 mg.

Ages 51 and older: 1.7 mg (Males) and 1.5 mg (Females).

Pregnancy: 1.9 mg. Lactation: 2.0 mg.

MAJOR SOURCES

Liver, brewer's yeast, banana, salmon, poultry, beef kidney, potato w/skin, legumes, prune juice, filberts, halibut, shrimp.

MAINTENANCE/THERAPEUTIC RANGE

10 mg to 500 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Asthma; cancer (lung); carpal tunnel syndrome; coronary heart disease; high homocysteine; kidney stones; morning sickness; premenstrual syndrome.

COMMENTS

Vitamin B6, along with B12 and folic acid, can lower homocysteine levels.

CAUTIONS

Consult with your health practitioner if you are under L-dopa treatment for Parkinson's disease. High doses (usually over 500 mg) may cause reversible peripheral neuropathy.

Vitamin B12

(Cobalamin)

DESCRIPTION/FUNCTION

Cobalamin is classified as a B-vitamin. It is involved in the metabolism of single-carbon fragments; essential for biosynthesis of nucleic acids, nucleoproteins, and red blood cells; role in metabolism of nervous tissue; involved with folate metabolism; related to growth.

DRI (RDA or AI for Adults)

Adults: 2.4 mcg.

Pregnancy: 2.6 mcg. Lactation: 2.8 mcg.

MAJOR SOURCES

Liver, clams, kidney, oysters, seafood, beef, lamb, lowfat yogurt. Vegans require supplement. Animal products (meat, poultry, fish, eggs) provide primarily two forms of B12: adenosylcobalamin and hydroxocobalamin. Dairy products (milk, yogurt, cheese) do not contain as much B12 (mostly methylcobalamin and hydroxocobalamin). Cyanocobalamin, the form commonly used in supplements, can be converted by the body into other forms of B12, including hydroxocobalamin.

MAINTENANCE/THERAPEUTIC RANGE

100 mcg to 5,000 mcg.

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer; chronic fatigue syndrome; coronary heart disease; high homocysteine; HIV/AIDS; infertility (male); memory loss.

COMMENTS

Vitamin B12 is stored in the liver, mostly as adenosylcobalamin. B12 works with folic acid in reducing homocysteine, a risk factor for heart disease. Two enzymatic reactions in humans have been identified requiring vitamin B12. One coenzyme is adenosylcobalamin and the other is methylcobalamin. Vitamin B12 offers protection to those who react to sulfites in food and wine.

CAUTIONS

None significant. Avoid cyanocobalamin if you have Leber's optic atrophy.

Vitamin C

(Ascorbic Acid; Ascorbate)

DESCRIPTION/FUNCTION

Classified as a water-soluble vitamin, it maintains intracellular cement substance with preservation of capillary integrity; co-substrate in hydroxylations requiring molecular oxygen; important in immune response, wound healing, and allergic reactions; increases absorption of nonheme (plant source) iron.

DRI (RDA or AI for Adults)

Males: 90 mg. Females: 75 mg. Smokers: an additional 35 mg.
Pregnancy: 85 mg. Lactation: 120 mg.

MAJOR SOURCES

Acerola cherry, citrus fruit, peppers (green and red), strawberries, tomatoes, fruit (most), vegetables (especially green and raw).

MAINTENANCE/THERAPEUTIC RANGE

200 mg to 10,000 mg (or 90% of bowel tolerance).

POSSIBLE THERAPEUTIC APPLICATIONS

Allergies; asthma; cancer (gastric); cataracts; common cold; coronary heart disease; high blood pressure; immune function; infection; macular degeneration; memory loss; osteoarthritis; osteoporosis; ulcers; wound healing.

COMMENTS

Vitamin C is an excellent antioxidant. It reduces oxidized vitamin E, and in turn, glutathione can reduce oxidized vitamin C. Most supplements contain vitamin C in the form of ascorbic acid. If the acidity is a problem, non-acidic forms exist as various salts, including calcium ascorbate and sodium ascorbate. There is a fat-soluble form of vitamin C called ascorbyl palmitate. There is little research supporting its use. The oxidized form of vitamin C, dehydroascorbic acid (dehydroascorbate) is also found in food. It can be converted back to ascorbic acid by glutathione. Also, vitamin C can cross the blood-brain barrier as dehydroascorbic acid, where it is then reduced back to ascorbic acid.

CAUTIONS

None significant. Large doses may interfere with some lab tests. Consult with your health practitioner if you have kidney stones, but it is not likely to be a problem.

Vitamin D

(D2: Ergocalciferol; D3: Cholecalciferol)

DESCRIPTION/FUNCTION

Vitamin D is classified as a fat-soluble vitamin, but it really is a prohormone. It is essential for normal growth and development; important for formation of normal bones and teeth; influences absorption and metabolism of phosphorus and calcium. Vitamin D can be toxic in large quantities, especially if taken for long periods of time.

DRI (RDA or AI for Adults)

Under age 51: 200 IU. Ages 51-70: 400 IU. Over 70: 600 IU.

Pregnancy/Lactation: 200 IU.

1 mcg of cholecalciferol = 40 IU. For example: 5 mcg = 200 IU.

MAJOR SOURCES

Vitamin D3: cod liver oil, herring oil, pacific oysters, salmon oil, mackerel, most fish. Vitamin D2 is plant derived (a special yeast is irradiated with UV light). Vitamin D2 is often used to fortify food products. Regular sunlight on un-sunblocked skin can provide the RDA.

MAINTENANCE/THERAPEUTIC RANGE

400 IU to 5,000 IU. (High range for limited time to increase bone density.)

POSSIBLE THERAPEUTIC APPLICATIONS

Cancer; multiple sclerosis; osteoporosis.

COMMENTS

For light-skinned people, exposing the face and arms to bright sunlight for ten minutes or so, several days per week, is enough to maintain moderately healthy levels of vitamin D. (Exposure time for light-skinned people living in mid- to lower latitudes, late spring to early fall, late morning to early afternoon.) However, because of vitamin D's anticancer properties, some health professionals are now recommending daily intakes of 1,000 IU or more. Also, new research shows that, for osteoporosis, more emphasis should be placed on vitamin D, and less on calcium.

CAUTIONS

Consult with your health practitioner before taking doses much greater than 1,000 IU.

Vitamin E

(Alpha-Tocopherol)

DESCRIPTION/FUNCTION

Vitamin E is classified as a fat-soluble vitamin. The vitamin E family contains eight members, in two groups: tocopherols (alpha, beta, gamma, delta) and tocotrienols (alpha, beta, gamma, delta). A strong antioxidant, vitamin E may help prevent oxidation of unsaturated fatty acids and vitamin A in the intestinal tract and body tissues. Vitamin E also protects red blood cells from hemolysis, and has roles in reproduction (in animals), epithelial tissue maintenance, and prostaglandin synthesis.

DRI (RDA or AI for Adults)

15 mg natural E (2R-isomers) or 30 mg synthetic E (2S-isomers).
Lactation: 19 mg natural E or 38 mg synthetic E.
Multiply mg by 1.49 to convert to IU.

MAJOR SOURCES

Wheat germ oil, nut and seed oils, nuts and seeds.

MAINTENANCE/THERAPEUTIC RANGE

100 IU to 1,000 IU (natural form).

POSSIBLE THERAPEUTIC APPLICATIONS

Angina pectoris; asthma; cancer (bladder, gastric, prostate); cataracts; coronary heart disease; immune function; infertility (male); macular degeneration; memory loss; neuropathy; osteoarthritis; Parkinson's disease; poor circulation; premenstrual syndrome; retinopathy; rheumatoid arthritis; stroke (ischemic).

COMMENTS

The more you take, the lower the percentage absorbed. Therefore, although vitamin E is fat-soluble and is stored in the body, it is better to take smaller doses several times per day. The natural form (d-, not dl-) is more biologically active. Most research has been done using alpha-tocopherol. There is growing interest in other members of the vitamin E family (gamma-tocopherol and the tocotrienols).

CAUTIONS

Consult with your health practitioner if you are taking blood thinning medication, have a bleeding disorder, or have suffered a recent stroke (hemorrhagic type).

Vitamin K

(K1: Phylloquinone; K2: Menaquinone; K3: Menadione)

DESCRIPTION/FUNCTION

Vitamin K is classified as a fat-soluble vitamin. It aids in production of prothrombin, a compound required for normal clotting of blood.

DRI (RDA or AI for Adults)

Males: 120 mcg; Females: 90 mcg.

MAJOR SOURCES

K1: Brussels sprouts, broccoli, cauliflower, Swiss chard, spinach, looseleaf lettuce, carrots, green beans, asparagus, eggs, strawberry, avocado, peapods. K2: meat and cheese. K2 can also be synthesized in the intestinal tract.

MAINTENANCE/THERAPEUTIC RANGE

50 mcg to 1,000 mcg.

POSSIBLE THERAPEUTIC APPLICATIONS

Osteoporosis.

COMMENTS

Vitamin K has some antioxidant activity.

CAUTIONS

Consult with your health practitioner if you are taking blood thinning drugs. Menadione, the synthetic form, is somewhat toxic in large amounts.

White Willow Bark

(Salix species: *Salix alba*, *Salix fragilis*, *Salix purpurea*)

DESCRIPTION/FUNCTION

Willow trees are native to central and southern Europe, but are now commonly found in many parts of North America. Willow bark has a long history of use for treating fevers and pain. The main active ingredient in willow bark is salicin (a glucoside), which can be converted to salicylic acid (a salicylate). Aspirin, acetylsalicylic acid, was originally synthesized from the salicylic acid found in willow bark. Active ingredients include glycosides (salicin, salicortin, fragilin, populin), flavonoids, tannins.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Bark.

MAINTENANCE/THERAPEUTIC RANGE

250 mg to 1,500 mg (standardized to 8% salicin).

POSSIBLE THERAPEUTIC APPLICATIONS

Headache; fever; inflammation; pain (arthritis, bursitis, back).

COMMENTS

White willow bark supplements work slower than aspirin, but the effects last longer. The bark of *Salix fragilis* and *Salix purpurea* contains higher concentrations of salicin than *Salix alba*.

CAUTIONS

Do not give to children to treat viral infections. Do not take if you are breast-feeding. Consult with your health practitioner if you are taking a blood thinning drug or other prescription medications.

Wild Yam

(Dioscorea villosa)

DESCRIPTION/FUNCTION

The wild yam used in supplements is native to the eastern United States and Mexico. Its rootstocks are not enlarged, and they are not like sweet potatoes, which belong to a different genus. Active ingredients include alkaloids (dioscorin, dioscorine), phytosterols (dioscine, stigmasterol), saponins (diosgenin, dioscin).

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Roots and rhizome.

MAINTENANCE/THERAPEUTIC RANGE

200 mg to 400 mg (standardized to 6% to 10% diosgenin).

POSSIBLE THERAPEUTIC APPLICATIONS

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COMMENTS

Wild yam products are sometimes sold as sources of natural progesterone or DHEA. However, the human body lacks many of the enzymes necessary to convert diosgenin into steroid hormones. This is done in a laboratory. Wild yam may be helpful to increase bile flow in the gallbladder. Wild yam creams and gels are sold as alternatives to taking it orally. The gels are sometimes used as vaginal lubricants.

CAUTIONS

Avoid if pregnant.

Xylitol

DESCRIPTION/FUNCTION

Xylitol is classified as a sugar alcohol. It is used as a sugar substitute, having about 40% fewer calories than sucrose. Xylitol is used in candy, chewing gum, and toothpaste. Xylitol does not have much of an effect on blood sugar levels, so it is found in products for diabetics. Another advantage of xylitol is that most bacteria cannot use it as a food. The bacteria consume it, but it does not benefit them, thus depriving them of needed calories. Xylitol is naturally found in some fruits (plums, raspberries, strawberries) and vegetables (cauliflower, eggplant). For commercial use, it is derived from the birch tree.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Food products and nutritional supplements.

MAINTENANCE/THERAPEUTIC RANGE

10 g to 20 g.

POSSIBLE THERAPEUTIC APPLICATIONS

Dental caries (tooth decay); earache (otitis media).

COMMENTS

Chewing gum and toothpaste sweetened with xylitol reduces tooth decay. Consuming xylitol various ways also reduces ear infections. Nasal sprays with xylitol can help with sinus infections (sinusitis). Finally, some animal research shows that consuming xylitol may help to strengthen bones.

CAUTIONS

None known for short periods of use.

Yohimbe

(Pausinystalia yohimbe)

DESCRIPTION/FUNCTION

Yohimbe is an evergreen tree that is native to the jungles of west Africa (Cameroon, Gabon, Zaire). The active ingredient is yohimbine, an indole alkaloid.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Tree bark.

MAINTENANCE/THERAPEUTIC RANGE

200 mg to 400 mg (standardized to 8% yohimbine).

POSSIBLE THERAPEUTIC APPLICATIONS

Erectile dysfunction.

COMMENTS

Yohimbe can improve problems with erections, regardless of the origin, and can also increase sexual desire. Yohimbe should only be used for short periods of time. There are also yohimbe products for women.

CAUTIONS

Avoid if pregnant. Yohimbine is a potent ingredient and should be used with caution. Consult with your health practitioner if you are taking any prescription medication. Do not take if you have heart disease, depression, high or low blood pressure, kidney, liver, or prostate problems. Do not combine with stimulants.

Yucca

(*Yucca aloifolia*; *Yucca brevifolia*)

DESCRIPTION/FUNCTION

There are about 30 species of yucca. As a group, they are stiff-leaved, evergreen shrubs and trees, native to North America. Two of the more common ones used therapeutically are the Spanish bayonet (*Yucca aloifolia*) and the Joshua tree (*Yucca brevifolia*). Native Americans used yucca for skin ailments and injuries, and yucca extract is used as a flavoring agent in some beverages. The active ingredients include saponins and resveratrol.

DRI (RDA or AI for adults)

None.

MAJOR SOURCES

Stalk and roots.

MAINTENANCE/THERAPEUTIC RANGE

500 mg to 1,500 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Osteoarthritis.

COMMENTS

Yucca may have other benefits, but little research has been done on any of its therapeutic effects.

CAUTIONS

None known.

Zinc

DESCRIPTION/FUNCTION

Zinc is classified as a trace mineral. It is a component of many enzyme systems and of insulin; is important in nucleic acid metabolism; and plays a role in energy metabolism, protein synthesis, collagen formation, alcohol detoxification, carbon dioxide elimination, sexual maturation, immune system, and taste and smell functions.

DRI (RDA or AI for Adults)

Males: 11 mg. Females: 8 mg.
Pregnancy: 11 mg. Lactation: 12 mg.

MAJOR SOURCES

Oysters, liver, crab, beef, turkey meat dark, pumpkin seeds, beef kidney, soynuts, lamb, almonds, peanuts, pecans, Brazil nuts, cashews.

MAINTENANCE/THERAPEUTIC RANGE

10 mg to 100 mg.

POSSIBLE THERAPEUTIC APPLICATIONS

Acne; common cold; immune function; infertility (male); macular degeneration; memory loss; prostate problems; rheumatoid arthritis; ulcers; wound healing.

COMMENTS

Zinc lozenges can help reduce the duration of the common cold if used within the first 24 hours of onset of symptoms. High doses of zinc can reduce copper levels, which is useful in cases of Wilson's disease.

CAUTIONS

Consult with your health practitioner if you are taking antibiotics or diuretics. High doses of zinc may lower HDL-cholesterol.

Abbreviations

Abbreviation	Meaning
AA	amino acid
ac	before meals
ACE	angiotensin-converting enzyme
ACTH	adrenocorticotropic hormone
ad lib or AD	as desired
AD	Alzheimer's disease
ADH	antidiuretic hormone
ADI	acceptable daily intake
ADL	activities of daily living
AI	adequate intake
AIDS	acquired immune deficiency syndrome
Ala	alanine
ALS	amyotrophic lateral sclerosis
amt	amount
ap	before dinner
aq	water
ARC	AIDS-related complex
ARF	acute renal failure
Arg	arginine
As	arsenic
Asn	asparagine
Asp	aspartate
ATP	adenosine triphosphate
B	boron
BAT	brown adipose tissue
BCAA	branched chain amino acid
BEE	basal energy expenditure
bib	drink
bid	twice daily
BM	bowel movement
BMR	basal metabolic rate
BP	blood pressure
BUN	blood urea nitrogen
BV	biological value
c	cup
C	centigrade; Celsius
C	carbon
Ca	calcium
CA	cancer
CAD	coronary artery disease
Cap	capsule
CBC	complete blood count
cc	cubic centimeter
CCK	cholecystokinin

CCU	coronary care unit
CDA	computerized dietary analysis
CF	cystic fibrosis
CHD	coronary heart disease
CHF	congestive heart failure
CHO	carbohydrate
chol	cholesterol
Cl	chlorine
cm	centimeter
CNS	central nervous system
Co	cobalt
CoA	coenzyme A
COPD	chronic obstructive pulmonary disease
CoQ	coenzyme Q, ubiquinone
CPK	creatine phosphokinase
CPR	cardiopulmonary resuscitation
Cr	chromium
CRF	chronic renal failure
CSF	cerebrospinal fluid
CSII	continuous subcutaneous insulin infusion
CT	computed tomography
Cu	copper
CVA	cerebrovascular accident
Cys	cysteine
DHA	docosahexaenoic acid
dil	dilute
disp	dispense
DJD	degenerative joint disease
DKA	diabetic ketoacidosis
DM	diabetes mellitus
DNA	deoxyribonucleic acid
DRI	dietary reference intake
Dx	diagnosis
dz	disease
ea	each
EAA	essential amino acid
EBV	Epstein-Barr virus
ECG/EKG	electrocardiogram
EEG	electroencephalogram
EPA	eicosapentaenoic acid
equiv	equivalent
ERT	estrogen replacement therapy
ESRD	end-stage renal disease
et	and
ETC	electron transport chain
ETOH	ethanol/ethyl alcohol
F	fluorine
FA	fatty acid
FAD	flavin adenine dinucleotide
FAS	fetal alcohol syndrome

FBG	fasting blood glucose
FBS	fasting blood sugar
Fe	iron
FFQ	food frequency questionnaire
fld	fluid
fl oz	fluid ounce
FMN	flavin mononucleotide
FSH	follicle-stimulating hormone
g or gm	gram
GBD	gallbladder disease
GE	gastroenteritis
GI	gastrointestinal
Glc	glucose
Gln	glutamine
Glu	glutamate
GTF	glucose tolerance factor
gtt	drops
GTT	glucose tolerance test
GU	genitourinary
HAV	hepatitis A virus
HBV	hepatitis B virus
Hgb	hemoglobin
HCG	human chorionic gonadotropin
HCl	hydrochloric acid
HCT	hematocrit
HDL	high-density lipoprotein
Hgb	hemoglobin
hGH	human growth hormone
His	histidine
HIV	human immunodeficiency virus
HTN	hypertension
HX	history
I	iodine
IBD	inflammatory bowel disease
IBS	irritable bowel syndrome
IBW	ideal body weight
ICU	intensive care unit
ID	intra dermal
IDDM	insulin-dependent diabetes mellitus
IGT	impaired glucose tolerance
IHD	ischemic heart disease
Ile	isoleucine
IM	intramuscular
in or "	inch
Inj	injection
IU	international unit
IUD	intrauterine device
IV	intravenous
IVH	intravenous hyperalimentation
K	potassium

kcal (Cal)	kilocalorie
kg	kilogram
KS	Kaposi's sarcoma
L or l	liter
lb	pound
LBM	lean body mass
LD or LDH	lactate dehydrogenase
LDL	low-density lipoprotein
LE	lupus erythematosus
Leu	leucine
LGA	large for gestational age
LH	luteinizing hormone
LNA	alpha-linolenic acid
Lot	lotion
Lys	lysine
m	meter
MAO	monoamine oxidase
mcg or µg	microgram
MCT	medium-chain triglyceride
mEq	milliequivalent
Met	methionine
mg	milligram
Mg	magnesium
MI	myocardial infarction
ml	milliliter
mm	millimeter
Mn	manganese
Mo	molybdenum
MSG	monosodium glutamate
MUFA	monounsaturated fatty acid
N	nitrogen
Na	sodium
NaCl	sodium chloride
NAD	nicotinamide adenine dinucleotide
NCEP	National Cholesterol Education Program
NE	niacin equivalent
NEC	necrotizing enterocolitis
NG	nasogastric
Ni	nickel
NIDDM	non-insulin-dependent diabetes mellitus
NLT	not less than
NMT	not more than
Noct	at night
NPO	nothing by mouth
NPU	net protein utilization
NSAID	nonsteroidal anti-inflammatory drug
NTE	not to exceed
OA	osteoarthritis
OCA	oral contraceptive agent
OGTT	oral glucose tolerance test

OHA	oral hypoglycemic agent
Oint	ointment
oz	ounce
P	phosphorus
Pb	lead
pc	after meals
PCM	protein-calorie malnutrition
PD	Parkinson's disease
PEM	protein-energy malnutrition
PER	protein efficiency ratio
per diem	per day
PG	prostaglandin
pH	hydrogen ion concentration
Phe	phenylalanine
PKU	phenylketonuria
po	by mouth
prn	as necessary (needed)
pro	protein
Pro	proline
pt	patient
PT	prothrombin time
PTH	parathyroid hormone
PTT	prothrombin time
PUFA	polyunsaturated fatty acid
PVD	peripheral vascular disease
pwd	powder
q	every
qam	every morning
qd	every day
qh	every hour
qhs	at bedtime, every night
qid	four times daily
qod	every other day
qs	sufficient quantity
qt	quart
R	rectal
RA	rheumatoid arthritis
RAST	radioallergosorbent test
RBC	red blood cell
RDA	Recommended Dietary Allowances
RDS	respiratory distress syndrome
RE	retinol equivalent
Redox	oxidation-reduction
REE	resting energy expenditure
Rep	repeat
RQ	respiratory quotient
RMR	resting metabolic rate
RNA	ribonucleic acid
Rx	treatment
S	without

SDAT	senile dementia of the Alzheimer type
Se	selenium
Ser	serine
SFA	saturated fatty acid
SGA	small for gestational age
SIDS	sudden infant death syndrome
SL	under the tongue
SLE	systemic lupus erythematosus
SMBG	self-monitoring of blood glucose
SOD	superoxide dismutase
Sol	solution
sos	if necessary
sq (sc)	subcutaneously
stat	immediately
STD	sexually transmitted disease
Sx	symptoms
tab	tablet
TB	tuberculosis
tbsp or T	tablespoon
TC	total cholesterol
TE	tocopherol equivalent
TEE	total energy expenditure
TEF	thermic effect of food
TFA	<i>trans</i> fatty acid
TG	triglyceride
Thr	threonine
TIA	transient ischemic attack
TIBC	total iron-binding capacity
tid	three times daily
TP	total protein
TPN	total parenteral nutrition
Trp	tryptophan
TSH	thyroid-stimulating hormone
tsp or t	teaspoon
Tyr	tyrosine
UA	urinalysis
UA	uric acid
UL	tolerable upper intake level
URI	upper respiratory infection
UTI	urinary tract infection
UV	ultraviolet radiation
V	vanadium
Val	valine
VLDL	very low-density lipoprotein
WBC	white blood cell count
wk	week
wt	weight
yo	years old
yrs	years
Zn	zinc

Glossary

ABETALIPOPROTEINEMIA: A disorder characterized by an absence from plasma of low-density lipoproteins, leading to a variety of problems associated with fat metabolism.

ABSORPTION: the process whereby nutrients pass through the intestines into the blood stream to be used by the body.

ACETOACETIC ACID: one of the ketone bodies composed of two molecules of acetyl-CoA; the end product of incomplete fatty acid oxidation, which may exist in starvation or in uncontrolled diabetes.

ACETONE: a dimethyl ketone with a pleasant ethereal odor that is the end product of unoxidized acetoacetic acid.

ACETYLCHOLINE: a neurotransmitter; acts as a vasodilator and depresses cardiac function.

ACHLORHYDRIA: an absence of hydrochloric acid in gastric juice that can accompany aging.

ACID: a compound yielding a hydrogen ion in a polar solvent, such as water; any chemical compound that has a sour taste.

ACID-BASE BALANCE: dynamic state of equilibrium with regard to hydrogen ion concentration in the body.

ACIDOSIS: the excessive accumulation of acid or hydrogen ions, or the loss of base from the body.

ACIDURIA: presence of acid in the urine.

ACQUIRED INDISPENSABLE AMINO ACIDS: may become indispensable in immaturity, in states of metabolic disorder, and/or during severe stress. Include: cysteine, tyrosine, arginine, citrulline, taurine.

ACRODERMATITIS ENTEROPATHICA: a genetically transmitted eczematous disease linked to malabsorption of zinc.

ACTIVE SITE: that part of the enzyme surface on which the reaction take place.

ACTIVE TRANSPORT: movement of substances across a membrane against the concentration gradient, requiring energy expenditure.

ACUTE: sharp or intense; disease or illness that begins suddenly, reaches a peak rapidly, and then subsides after a short period.

ADENOSINE TRIPHOSPHATE (ATP): a high-energy molecule involved in energy metabolism and RNA synthesis; required for many chemical reactions in the body.

ADEQUATE INTAKE (AI): recommended daily intake level based on observed or experimentally determined approximations of nutrient intake by a group (or groups) of

healthy people; these nutrient recommendations are used when a recommended dietary allowance (RDA) cannot be determined.

ADIPOSE: of or related to animal fat; the fat found in adipose tissue.

ADRENAL GLANDS: glands located at the upper end of each kidney. The cortex produces estrogen, androgen, progesterone, aldosterone, and cortisone; the medulla produces epinephrine and norepinephrine.

ADRENERGIC SYMPTOMS: symptoms of hypoglycemia that arise from the action of the autonomic nervous system.

ADRENOCORTICAL HORMONES: hormones of the adrenal cortex: aldosterone and cortisone.

AEROBIC: living or occurring only in the presence of oxygen.

AEROBIC CAPACITY: the maximum amount of air that can be moved in and out of the lungs in a given amount of time.

AEROBIC EXERCISE: exercise that increases oxygen uptake and improves cardiovascular fitness, such as jogging, brisk walking, or cycling.

AFLATOXIN: a potent and sometimes lethal (carcinogenic) fungal toxin that can be found on peanuts and cereal grains, particularly in climates of high temperature and humidity.

AGE-ASSOCIATED OSTEOPOROSIS (Type II): a loss of density in both cortical and trabecular bone that occurs in elderly of both sexes after age 70; characterized by wedge fractures of the thoracic vertebrae that lead to back pain, loss of height, and “dowager’s hump.”

ALBUMIN: a protein in the blood which serves as an indicator of protein status; contributes to maintenance of appropriate osmotic pressure and fluid balance between extracellular and intracellular fluids.

ALCOHOL DEHYDROGENASE: a liver enzyme that converts ethanol to acetaldehyde; the first step in alcohol metabolism.

ALDOSTERONE: an adrenocortical hormone that acts on the distal tubules of the kidney to resorb sodium and water, and to excrete potassium.

ALKALOSIS: excessive accumulation of base, or the loss of hydrogen ions or acid from the body.

ALLERGEN: a substance that is capable of producing an allergic response in the body.

ALLERGY: a hypersensitive state caused by the interaction of an allergen with an antibody.

ALLICIN: a sulfur compound contained in garlic, which is responsible for garlic’s odor; acts as an antibacterial agent.

ALLYL SULFIDES: organosulfur phytochemicals found in allium vegetables (chive, garlic, leek, onion, shallot); may act as cancer-blocking or cancer-suppressing agents.

ALPHA-TOCOPHEROL: the form of vitamin E having the highest biologic activity.

AMENORRHEA: absence or abnormal stoppage of menses. Often occurs in females who regularly exercise vigorously, and in females who have low percents of body fat.

AMINO ACID (AA): an organic compound containing an amino group (NH₂) and a carboxyl group (COOH), which functions as one of the building blocks of protein.

AMINO GROUP: NH₂; one nitrogen and two hydrogens.

AMYLASE: an enzyme found in the saliva (ptyalin) and small intestine that hydrolyzes starch to dextrin and maltose.

AMYLOPHAGIA: a form of pica involving consumption of excessive amounts of starch, such as laundry starch.

AMYLOPECTIN: a form of starch; branched chains of glucose units.

AMYLOSE: a form of starch; long straight chains of glucose units.

ANABOLISM: the building up in the body of complex chemical compounds from smaller, simpler compounds, usually with the use of energy.

ANAEROBIC: living or occurring without the presence of oxygen.

ANAPHYLAXIS: an acute, often severe, and sometimes fatal immune response that may affect any body system.

ANDROID FAT DEPOSITION: deposition of fat around the waist and upper abdomen; "apple-shape" fat distribution.

ANEMIA: a deficiency in the size or number of RBCs, or in the amount of hemoglobin they contain that limits the exchange of oxygen and carbon dioxide between the blood and the tissues.

ANEURYSM: the ballooning out of an artery wall at a point where it has been weakened by deterioration.

ANGINA PECTORIS: chest pain with sensations of suffocation caused by temporary reduction of oxygen to the heart muscle through narrowed, diseased coronary arteries.

ANGULAR STOMATITIS: inflammation at the corners of the mouth.

ANOREXIA NERVOSA: an eating disorder characterized by refusal to eat and a loss of at least 25% of body weight. Also, body image, sense of control, and family and social relationship abnormalities.

ANTACID: an agent that neutralizes acid in the stomach, esophagus, or first part of the duodenum.

ANTIBODY: a protein molecule from the immune system that counteracts the effects of invading organisms and other foreign species.

ANTICHOLINERGIC AGENT: blocks the effects of the parasympathetic nervous system that are mediated by acetylcholine.

ANTIDIABETIC AGENT: drug used to control diabetes; lowers blood glucose levels.

ANTIDIURETIC HORMONE: a hormone secreted by the posterior pituitary that is responsible for resorption of water by the distal portion of the kidney tubules, and thus the control of water excretion.

ANTIGEN: any substance that can elicit the formation of an antibody specific for that substance when introduced into a foreign species.

ANTIHISTAMINE: an agent that prevents histamine from acting on body tissues.

ANTIOXIDANT: an agent that inhibits oxidation and thus prevents rancidity of oils or fats or the deterioration of other materials through oxidative processes; includes vitamins C and E, beta-carotene, SOD, coenzyme Q, catalase, glutathione.

ANTIVITAMIN: a substance that interferes with the synthesis or metabolism of vitamins.

APOENZYME: an enzyme before attachment of its coenzyme or prosthetic group; nonfunctional.

APPETITE: a natural desire to eat, especially when food is present.

ARACHIDONIC ACID: an unsaturated 20-carbon fatty acid that is a precursor of prostaglandin synthesis.

ARRHYTHMIA: abnormal rhythm of the heartbeat.

ARTERIOSCLEROSIS: thickening, hardening, or loss of elasticity of the walls of the arteries.

ARTERY: a vessel that carries blood away from the heart.

ASCORBIC ACID: one form of vitamin C.

ASPARTAME: a dipeptide sweetener composed of the amino acids, phenylalanine and aspartic acid.

ASSIMILATION: after food is broken down by digestion, it is then absorbed (assimilated) by passing through the intestinal walls.

ATHEROGENIC: having the capacity to initiate, increase, or accelerate the formation of atheromas.

ATHEROMA: mass of plaque composed of lipids, cholesterol, and degenerated, thickened arterial intima occurring in atherosclerosis.

ATHEROSCLEROSIS: a thickening and narrowing of the walls of the large and medium-sized blood vessels caused by the invasion of lipids, primarily cholesterol and other materials, into the intimal or inner layer to form plaque. The major type of arteriosclerosis.

ATROPHY: wasting of a cell, tissue, or part.

ATROPHIC GASTRITIS: chronic inflammation of the stomach lining with loss of mucosal cells and reduced secretion of hydrochloric acid (HCl).

AUTONOMIC NERVOUS SYSTEM: the division of the vertebrate nervous system that regulates involuntary actions, as of the intestines, heart, and glands, and comprises the sympathetic nervous system and the parasympathetic nervous system.

AVIDIN: the protein in raw egg whites that binds biotin.

BASAL ENERGY EXPENDITURE (BEE): the amount of energy used in 24 hours by a person who is lying quietly, 12 hours after the last meal, in a comfortable temperature and environment. The energy expended in maintenance of basal metabolic processes or involuntary activities in the body (respiration, circulation, gastrointestinal function, muscle tone, and body temperature) and functional activities of organs.

BASAL METABOLIC RATE (BMR): the basal energy expenditure expressed as kcal/kg body weight/hr.

BASE: a water-soluble, bitter compound capable of neutralizing an acid to form a salt; yields a hydroxyl ion.

BERIBERI: thiamin deficiency disease; affects peripheral nerves and the heart.

BETA-CAROTENE: a precursor of vitamin A found in plant foods, especially dark green and deep yellow vegetables and fruits.

BETA-OXIDATION: the process of fatty acid catabolism, in which two-carbon fragments are removed in succession from the carboxyl end of the chain.

BICARBONATE: an alkaline secretion of the pancreas that helps to neutralize the acidic chyme.

BILE: a bitter, alkaline brownish-yellow or greenish-yellow liquid that is secreted by the liver, stored in the gallbladder, and discharged into the duodenum and that aids in digestion, chiefly by saponifying fats; made from cholesterol.

BILE ACID SEQUESTRANT: a medication that adsorbs cholesterol-containing bile acids and prevents their absorption back into the blood stream.

BIOAVAILABILITY: the degree to which a drug or other substance becomes available to the target tissue.

BIOCHEMICAL MALNUTRITION: abnormal levels of constituents (in body fluids and waste products) indicative of normal nutritional state that can be attributed to excess or deficiency of nutrient intake; precedes clinical malnutrition.

BIOFLAVONOID: naturally occurring flavone or coumarin derivatives having the activity of the so-called vitamin P; found in brightly colored fruits and vegetables.

BIOLOGICAL VALUE: a measure of protein quality; the amount of protein nitrogen that is retained from a given amount of protein nitrogen that has been digested and absorbed.

BLOOD-BRAIN BARRIER: a barrier composed of the cells lining the blood vessels in the brain, which are highly selective in what they allow to pass into the brain.

BODY IMAGE: a mental picture a person has of his or her physical self.

BODY IMAGE DISTORTION: an abnormal or untrue view of one's body size.

BODY MASS INDEX (BMI): weight divided by height (kg/m^2); a definition of the level of adiposity.

BOLUS: the portion of food swallowed at one time.

BONE REMODELING: the process by which bone is continually dismantled and reformed in order to repair itself, grow, adapt to stresses and strains, and furnish calcium for other body needs.

BOTULISM: food poisoning caused by the toxin produced by *Clostridium botulinum*.

BRADYCARDIA: abnormal slowness of the heart rate and pulse.

BRANCHED-CHAIN AMINO ACIDS: the amino acids valine, isoleucine, and leucine.

BROWN ADIPOSE TISSUE (BAT): fat located in the scapular area that is involved in heat production for cold adaptation, and possibly burning off excess energy; especially important in hibernating animals.

BRUSH BORDER: the microvilli that greatly increase the surface area of the intestinal mucosal cell.

BULIMIA NERVOSA: an eating disorder that is characterized by periods of bingeing and purging, unrealistic ideas about food, and distortion of body image.

BUTYRATE (butyric acid): a short-chain fatty acid that is the preferred fuel of intestinal cells; produced by bacterial fermentation of dietary fiber.

CALCIFICATION: the process in which calcium, phosphorus, and other minerals crystallize on the collagen matrix of a growing bone, hardening it.

CALCITONIN: a hormone that opposes the action of parathyroid hormone in regulating blood calcium levels and bone mineralization.

CALCITRIOL: metabolically active form of vitamin D produced by the kidney and which functions as a hormone.

CALMODULIN: a protein that relays calcium's messages.

CALORIE: the amount of energy required to raise the temperature of 1 ml of water at a standard initial temperature by 1° C.

CANCER CACHEXIA: the weak, malnourished, and emaciated condition that results from cancer.

CAPILLARY: a small vessel that branches from an artery, connecting the artery to a vein. This is where the exchange of oxygen, nutrients, and waste materials takes place.

CARBOHYDRATES: organic compounds that consist of carbon, hydrogen, and oxygen. Often abbreviated CHO. In their simplest form, the general formula is $C_nH_{2n}O_n$. They vary from simple sugars containing from 3 to 7 carbon atoms to very complex polymers.

CARBOXYL GROUP: COOH; one carbon, two oxygens, and one hydrogen; a characteristic of all organic acids.

CARCINOGEN: a substance which produces cancer.

CARDIOMYOPATHY: a subacute or chronic disorder of the heart muscle.

CARNITINE: a vitamin-like cofactor that facilitates transfer of long-chain fatty acids across the mitochondrial membranes for use as an energy source.

CAROTENEMIA: the presence of high levels of carotene in the blood resulting in yellow appearance of the skin.

CAROTENOIDS: yellow or red pigments found in carrots, sweet potatoes, leafy vegetables, milk fat, and egg yolk; some can be converted into vitamin A in the body; some appear to be protective against cancer. Beta-Carotene is one of hundreds.

CARPAL TUNNEL SYNDROME: tingling and numbness in part of the hand and wrist, and shooting pains up the arm, caused by swelling of tissue surrounding a nerve that passes through the wrist bones. Associated with repetitive movements. Now called repetitive strain injury.

CASEIN: the principal protein of cow's milk.

CATABOLISM: the breaking down in the body of complex chemical compounds into simpler ones, often accompanied by the liberation of energy.

CATALYST: a substance that speeds up a chemical reaction without being changed itself.

CATHARTIC: a strong laxative; purgative.

CECUM: the large blind pouch forming the beginning of the large intestine.

CELIAC DISEASE: condition resulting from lack of the enzyme necessary to break down the protein in gluten found in wheat and some other grains; results in diarrhea, steatorrhea, and general malabsorption, unless gluten is eliminated from the diet.

CELLULAR THEORY: a theory that relates aging to the creation of cross-linkages between macromolecules.

CELLULOSE: a structural carbohydrate in plant material that resists hydrolysis in the human digestive tract.

CEREBROVASCULAR ACCIDENT (CVA): a stroke or aneurysm in the brain.

CERULOPLASMIN: a plasma protein that transports copper and acts as an oxidase.

CHEILOSISS: fissures of lips and mouth due to dietary riboflavin deficiency.

CHELATE: a complex formed between a metal ion and a polar molecule.

CHEMICAL SCORE: a rating of the quality of a test protein arrived at by comparing its amino acid pattern with that of a reference protein.

CHOLECALCIFEROL: vitamin D₃; animal derived.

CHOLESTASIS: retention and accumulation of bile in the liver due to factors within or outside the liver.

CHOLESTEROL: the chief steroid in the body; found in all tissues, especially the brain, nerves, adrenal cortex, and liver. It is a constituent of bile and serves as a precursor of vitamin D. Cholesterol within the body comes from two sources: (1) exogenous, or dietary, cholesterol, chiefly from egg yolk, liver and other organ meats, and dairy products; and (2) endogenous cholesterol, synthesized by the liver and other organs, such as the adrenal cortex, skin, and intestines. Cholesterol circulates in the blood as lipoprotein in combination with protein and other blood lipids. LDL fractions are strongly

related to the incidence of coronary heart disease, while HDL fractions are inversely related to this disease.

CHOLECYSTOKININ: a hormone produced by the upper intestinal mucosa that stimulates contraction of the gallbladder and secretion of pancreatic digestive enzymes.

CHOLESTYRAMINE: a drug used to lower blood cholesterol or lipid levels.

CHRONIC: prolonged; a disease that develops slowly and persists for a long time, possibly for the remaining years of life.

CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD): any disorder, such as asthma, chronic bronchitis, and pulmonary emphysema, marked by persistent obstruction of bronchial air flow.

CHYLOMICRONS: droplets consisting of triglyceride, cholesterol, phospholipids, and protein that are the form by which absorbed long-chain triglycerides and cholesterol are transported from the intestine into the intestinal blood or lymphatic system.

CHYME: the semifluid, homogeneous, gruel-like material produced by the gastric digestion of food that is expelled by the stomach into the duodenum.

CIRRHOSIS: irreversible liver damage involving death of liver cells and their replacement by scar tissue; often associated with alcoholism.

CLINICAL MALNUTRITION: changes in skin, hair, membranes, or growth that can be attributed to an excessive or deficient intake of a nutrient or nutrients.

COBALAMIN: vitamin B12, a cobalt-containing complex.

COENZYME: a nonprotein compound, usually a vitamin or mineral, which forms the active portion of an enzyme.

COENZYME Q10: a ubiquinone that has redox properties, enabling it to function as a fat-soluble antioxidant; an essential component of the electron transport chain.

COFACTOR: a mineral that, like a coenzyme, works with an enzyme to facilitate a chemical reaction.

COLLAGEN: the major protein of the white fibers of connective tissue, cartilage, and bone, which is insoluble in water.

COLON: the section of the large intestine extending from the cecum to the rectum.

COLOSTRUM: the thin, yellow, milky fluid secreted by the mammary gland a few days before and after birth, prior to secretion of mature milk.

COMBINATION THERAPY: a form of therapy for diabetes using combinations of oral medication or a combination of oral medications and insulin injections.

COMPLEMENTARY PROTEINS: two or more proteins whose amino acid profiles complement each other in such a way that the essential amino acids missing from each are supplied by the other.

COMPLETE PROTEIN: a protein containing all the amino acids essential in human nutrition in adequate amounts.

COMPLETELY DISPENSABLE AMINO ACIDS: extensively synthesized in the body and not essential components of the diet. Include: alanine, glutamic acid, aspartic acid, glycine, serine, proline, glutamine, asparagine.

COMPLEX CARBOHYDRATES: the polysaccharides (starch, glycogen, and some fibers).

CONDITIONALLY DISPENSABLE AMINO ACIDS: amino acids that become indispensable under certain conditions. Include: tyrosine, cysteine. Cysteine and tyrosine can reduce the requirements for the indispensable amino acids methionine and phenylalanine, respectively.

CONES: the cells of the retina that respond to bright light and are responsible for color vision.

CONGENITAL: existing at, and usually before birth.

CONGESTIVE HEART FAILURE (CHF): a syndrome caused by heart disease, which is characterized by breathlessness, chest pain, and abnormal sodium and water retention by the kidney.

CONSTIPATION: a condition in which the frequency or quantity of defecation is reduced.

CORONARY HEART DISEASE (CHD): impairment of circulation in the vasculature of the heart due primarily to the deposition of arterial fatty plaque; also called coronary artery disease (CAD).

CORTICAL BONE: the compact bone of the shaft that surrounds the medullary cavity.

CORTISOL: the major adrenal cortical steroid influencing carbohydrate metabolism. It increases the release of glucose from the liver, stimulates gluconeogenesis from amino acids, and decreases peripheral use of blood glucose.

C-REACTIVE PROTEIN (CRP): a sensitive plasma-protein marker of inflammatory status, which may be associated with coronary artery disease.

CRETINISM: a chronic condition due to congenital lack of thyroid secretion, marked by arrested physical and mental development, dystrophy of the bones and soft parts, and lowered basal metabolism.

CRUCIFEROUS VEGETABLES: a group of vegetables named for their cross-shaped blossoms (broccoli, Brussels sprouts, cabbage, cauliflower, turnips, rutabagas), which may help to prevent certain cancers.

CRUDE FIBER: the amount of plant material remaining after being subjected to treatment with acid and alkali.

CYANOSIS: a blue discoloration of the skin reflecting excessive concentration of reduced hemoglobin in the blood due to poor oxygenation.

CYSTIC FIBROSIS: a congenital disease of mucous glands throughout the body, usually developing during childhood and causing pancreatic insufficiency and pulmonary disorders.

CYTOCHROME: any electron transfer hemoprotein.

CYTOCHROME P450 SYSTEM: an enzyme system in the body that transforms drugs and other endogenous materials to water-soluble compounds so that they can be excreted.

DAILY REFERENCE VALUES (DRVs): a set of dietary references for food labels consisting of nutrients (except for protein) for which no set of standards previously existed; DRVs have been set for fat, saturated fatty acids, cholesterol, total carbohydrate, protein, fiber, sodium, and potassium.

DAILY VALUE (DV): dietary reference term on food labels to aid consumers in selecting a healthy diet, consisting of two sets of references, the RDIs and DRVs.

DAWN PHENOMENON: an increase in blood glucose levels between 4 a.m. and 8 a.m., when natural adrenalin begins to function; possibly caused by a diurnal variation in growth hormone.

DEFECATION: the act of voiding the rectum to eliminate waste.

DEHYDRATION: excessive loss of body water.

DELANEY CLAUSE: a clause of the Food Additive Amendment that prohibits the use of any substance shown to cause cancer in animals or humans.

DEMENCIA: irreversible deterioration of intellectual faculties with accompanying emotional disturbance resulting from organic brain disorder.

DENATURATION: “unraveling” or breaking down of the shape (tertiary structure) of proteins by mechanical agitation, heat, cold, acidity, or alkalinity.

DEOXYRIBONUCLEIC ACID (DNA): the nucleic acid present in the chromosomes ultimately responsible for protein synthesis and the transmittance of genetic information.

DERMATITIS: inflammation of the skin.

DEXTRIN: an intermediate product of starch hydrolysis. Composed of short glucose chains.

DEXTROSE: glucose produced by the hydrolysis of corn starch.

DIABETES MELLITUS: a disorder of carbohydrate, fat, and protein metabolism resulting from a lack of insulin secretion by the pancreas.

DIABETIC KETOACIDOSIS: acidosis accompanied by the accumulation of ketone bodies in the body tissues and fluids; caused by a lack or inadequacy of insulin. If left untreated with insulin and fluids, can lead to coma and death.

DIARRHEA: abnormal frequency and liquidity of stools.

DIASTOLIC BLOOD PRESSURE: the blood pressure when the heart muscle is relaxed and blood is entering the heart chambers.

DIETARY FIBER: the amount of plant material remaining after treatment with digestive enzymes and reduction with acid and alkali.

DIETARY GUIDELINES FOR AMERICANS: dietary recommendations for healthy Americans, age 2 years and over, about food choices that promote health, specifically with respect to prevention or delay of chronic diseases.

DIETARY REFERENCE INTAKE (DRI): an umbrella term designed to encompass the four specific types of nutrient recommendations featured in the DRIs (AI, EAR, RDA and UL); the DRI are used for nutrient recommendations for the United States and Canada.

DIGESTION: the process whereby ingested food is converted into material suitable for assimilation for synthesis of tissues or liberation of energy. Usually involves hydrolysis.

DIGLYCERIDE (diacylglycerol): a lipid with two fatty acid chains attached to the glycerol molecule.

DIPEPTIDE: two amino acids bonded together by a peptide bond.

DISACCHARIDE: a sugar capable of being digested to two monosaccharide molecules; sucrose, maltose, lactose.

DISPENSABLE AMINO ACIDS: amino acids can either be synthesized from indispensable amino acids or from appropriate carbon skeletons readily manufactured in the cell; glutamate, alanine, aspartate, glutamine.

DIURESIS: increased secretion of urine.

DIURETIC: a drug (“water pill”) that promotes diuresis.

DIVERTICULITIS: inflammation of diverticula.

DIVERTICULOSIS: presence of diverticula that are herniations of the mucous membrane through the muscular layers of the colonic wall; common among older people and may be related to low fiber intake.

DOCOSAHEXAENOIC ACID (DHA): an omega-3 fatty acid found in fish.

DUMPING SYNDROME: a complex physiologic response to the rapid emptying of the gastric contents into the jejunum.

DUODENUM: the beginning portion of the small intestine, starting at the lower end of the stomach and extending to the jejunum.

DYSBIOSIS: an imbalance in gut microflora.

DYSGEUSIA: loss of the sense of taste.

DYSENTERY: an infection of the GI tract caused by an amoeba or bacterium, causing severe diarrhea.

DYSPEPSIA: discomfort in the abdominal region following eating.

DYSPHAGIA: difficulty in swallowing.

DYSTROPHY: any disorder arising from defective or faulty nutrition.

EATING DISORDER: abnormal behaviors related to food and eating that may include starving, bingeing, vomiting, laxative abuse, or excessive exercise accompanied by bizarre ideas about food, unrealistic body image, and psychologic and developmental abnormalities.

ECLAMPSIA: the late stage of pregnancy-induced hypertension characterized by proteinuria and, often, grand mal seizures occurring near the time of labor.

ECZEMA: a noncontagious inflammation of the skin, marked mainly by redness, itching, and the outbreak of lesions that discharge serous matter and become encrusted and scaly.

EDEMA: the abnormal accumulation of fluid in the intercellular tissue spaces or body cavities.

EICOSANOID: any of the biologically active substances derived from arachidonic acid, eicosatetraenoic acid, and eicosapentaenoic acid, including the prostaglandins, thromboxanes, and leukotrienes.

EICOSAPENTAENOIC ACID (EPA): an omega-3 fatty acid found in fish.

ELECTROLYTE: substances in solution with a positive electrical charge (sodium, potassium, calcium, magnesium) or a negative charge (chloride, CO₂, phosphorus, sulfate, lactate).

ELECTRON TRANSPORT CHAIN (ETC): along with the process of oxidative phosphorylation, enables the production of ATP, the energy “currency” of the body.

ELIMINATION DIET: an eating plan in which individual foods suspected of causing intolerance or allergic reactions are omitted for a period of time in order to determine if there is an improvement in the individual’s condition.

EMBOLISM: when a thrombus breaks loose and causes sudden closure of a blood vessel.

EMETIC; an agent that causes vomiting.

EMULSIFYING: converting two liquids into a suspension in which one liquid is distributed in small globules throughout the body of a second liquid, usually between an oil-based liquid and a water-based liquid.

ENDOCRINE GLAND: any of the ductless glands, such as the thyroid or adrenal, the secretions of which pass directly into the bloodstream from the cells of the gland.

ENDOGENOUS: produced from within.

ENDOGENOUS OPIATES: morphine-like compounds produced in the brain in response to pain, stress, certain drugs, and exercise. They act as internal tranquilizers, reducing arousal level.

ENRICHED FOOD: a food to which nutrients have been added, usually to replace some of the nutrients lost in processing.

ENTEROGASTRONE: a hormone, secreted by the duodenal mucosa in response to the presence of fat in the duodenum, that inhibits gastric secretion and motility, thus slowing the delivery of further lipid into the duodenum.

ENTERAL NUTRITION: the delivery of nutrients directly into the stomach, duodenum, or jejunum.

ENTEROHEPATIC CIRCULATION: the recurrent cycle in which bile salts and other substances excreted by the liver pass through the intestinal mucosa and become reabsorbed by the hepatic cells and re-excreted.

ENTEROPATHOGENIC ORGANISM: any organism, usually bacterial, that causes intestinal disease or disturbance.

ENZYME: a protein, secreted by cells, that acts as a catalyst to induce chemical changes in other substances, without being changed itself.

EPINEPHRINE: a hormone secreted by the adrenal medulla; a potent stimulant resulting in increased heart rate and force of contraction, vasoconstriction or vasodilation, relaxation of bronchiolar and intestinal smooth muscle, glycogenolysis, lipolysis, and other metabolic effects.

EPITHELIUM: membranous tissue, usually in a single layer, composed of closely arranged cells separated by very little intercellular substance, and forming the covering of most internal surfaces and organs and the outer surface of the body.

ERGOCALCIFEROL: vitamin D₂; plant derived.

ERGOGENIC AID: a substance or practice that increases energy or work output.

ERROR THEORY: a theory that relates aging to environmental damage to the DNA template, leading to errors in the genetic program.

ERYTHROCYTE: mature red blood cell (RBC).

ERYTHROPOIESIS: the production of red blood cells (RBCs).

ERYTHROPOIETIN: a hormone that stimulates the bone marrow to produce RBCs.

ESADDI (Estimated Safe and Adequate Daily Dietary Intakes): recommended ranges of appropriate intake of those nutrients for which not enough information is available to establish an RDA.

ESSENTIAL AMINO ACIDS (EAA): see indispensable amino acids.

ESSENTIAL FAT: the body fat located in specific sites that is necessary for survival; about 4% to 7% of body weight.

ESSENTIAL FATTY ACIDS (EFA): linoleic and alpha-linolenic acids, which cannot be produced by the body and must be provided in the diet.

ESTERIFY: to combine an acid and an alcohol with elimination of a molecule of water, forming an ester.

ESTIMATED AVERAGE REQUIREMENT (EAR): nutrient intake value that is estimated to meet the requirement of half the healthy individuals in a group.

ESTIMATED SAFE AND ADEQUATE DAILY DIETARY INTAKES (ESADDIs): recommended ranges of appropriate intake of those nutrients for which not enough information is available to establish an RDA.

ESTROGEN REPLACEMENT THERAPY (ERT): administration of synthetic estrogen to replace the natural hormone, which declines after menopause.

EXOGENOUS: derived or developed externally.

EXTERNAL CUE THEORY: the theory that some people eat in response to such external factors as the presence of food, or the time of day, rather than to such internal factors as hunger.

EXTRACELLULAR: occurring outside the cells.

EXTRACELLULAR WATER: the water in the plasma, lymph, spinal fluid, and secretions.

FACILITATED DIFFUSION: movement of particles across a membrane via a carrier protein.

FASTING HYPOGLYCEMIA: low blood glucose that occurs in the food-deprived state.

FAT: a mixture of triglycerides.

FAT CELL THEORY: the theory that during the growing years, fat cells respond to overfeeding by increasing in number; that the number of fat cells becomes fixed before adulthood, and that the number regulates hunger, so that an individual overfed during infancy or childhood will always have the desire to overeat.

FATFOLD TEST: a clinical test of body fatness in which the thicknesses of folds of skin in several areas of the body are measured with a caliper.

FAT-SOLUBLE VITAMINS: those vitamins that must be dissolved in dietary fats in order to be absorbed (vitamins A, D, E, K).

FATTY ACID: a straight carbon chain (usually 4-22 carbons long) terminating in a carboxyl group at one end, and a methyl group at the other; has the general formula $C_nH_{2n}O_2$ when fully saturated; originates from the hydrolysis of fats.

FATTY LIVER: an early stage of liver deterioration seen in several disease, including kwashiorkor and alcoholic liver disease.

FATTY STREAK: a small, flat, yellow-gray area composed mainly of cholesterol within an artery; probably an early stage of atherosclerosis.

FERMENTATION: enzymatic decomposition of carbohydrates that is anaerobic and ends with the production of alcohol.

FERRITIN: an iron-apoferritin complex that is a major storage form of iron, found in liver, spleen, bone marrow, and reticuloendothelia cells.

FERROUS IRON: divalent form of iron; form in which iron is absorbed.

FETAL ALCOHOL SYNDROME: a syndrome resulting from fetal exposure to the teratogenic effects of alcohol.

FIBER (ROUGHAGE): compounds of plant origin that are not capable of hydrolysis by enzymes in the human gut.

FIBROCYSTIC BREAST DISEASE: characterized by formation of small cysts containing fluid.

FLAVIN ADENINE DINUCLEOTIDE (FAD): a coenzyme form of riboflavin (vitamin B2), participating in one- or two-electron redox reactions.

FLAVIN ADENINE MONONUCLEOTIDE (FMN): a coenzyme form of riboflavin (vitamin B2), participating in one- or two-electron redox reactions.

FLAVONOIDS: a subclass of phenol phytochemicals that are pigments and that act as free radical scavengers in plants.

FOOD ALLERGY: an adverse reaction to a food that is mediated by an immunologic mechanism; occurs consistently after consumption of that food and causes functional changes in target organs; food hypersensitivity.

FOOD DIARY: a means of assessing nutrient intake by asking an individual to record the types and amounts of all foods and liquids consumed over a certain number of days.

FOOD FREQUENCY QUESTIONNAIRE: a means of assessing nutrient intake in which individuals are asked to indicate how frequently they consume particular foods; may also include the amount of each food consumed.

FOOD GUIDE PYRAMID: translates the RDAs and the dietary guidelines into the kinds and amounts of food to eat each day.

FOOD INTOLERANCE: an adverse reaction to a food caused by toxic, pharmacologic, metabolic, or idiosyncratic reactions to the food or chemical substances in the food.

FORTIFIED: refers to the addition of nutrients to a food, often not originally present, and often added in amounts greater than might be found there naturally.

FREE RADICAL: an atom or molecule that has at least one unpaired electron; highly reactive, they can damage structures in the body; neutralized by antioxidants.

FREE-RADICAL THEORY: a theory that relates aging to cellular damage caused by free radicals.

FRUCTOOLIGOSACCHARIDES (FOS): a nonabsorbed polymer of fructose that supports the growth of colonic bacteria.

FRUCTOSE: a monosaccharide occurring in fruit, honey, and some vegetables; the sweetest of the monosaccharides.

GALACTOSE: a monosaccharide produced by the hydrolysis of lactose by digestive enzymes.

GALACTOSEMIA: an inborn error of metabolism resulting in the presence of lactose in the blood; symptoms include jaundice, enlarged liver and spleen, anorexia, weight loss, vomiting, diarrhea, cataract formation, and mental retardation.

GALLBLADDER: the organ that stores and concentrates bile.

GALLSTONE: a small stone formed by the accumulation of bile salts and can block the bile duct.

GASTRIC GLANDS: glands in the stomach wall that secrete gastric juice into the stomach.

GASTRIC INHIBITORY POLYPEPTIDE: a hormone released from the intestinal mucosa in the presence of fat and glucose that inhibits gastric acid secretion and stimulates insulin release.

GASTRIC JUICE: the secretion of the gastric glands in the stomach. Contains mostly hydrochloric acid and pepsins.

GASTRIC MOTILITY: the spontaneous peristaltic movements in the stomach that mix food and gastric secretions and move food through the stomach and into the duodenum.

GASTRIC ULCER: an ulcer of the gastric mucosa that is not associated with excessive gastric acid secretion, but rather with disruption of the gastric mucosal barrier.

GASTRIN: a hormone elaborated by the pyloric mucosa that stimulates hydrochloric acid secretion by the parietal cells.

GASTRITIS: inflammation of the stomach.

GASTROENTERITIS: inflammation of the stomach and the intestines.

GASTROINTESTINAL TRACT (GI tract): the system of the body responsible for the intake, digestion, and absorption of nutrients; the main organs are the stomach and intestines.

GENISTEIN: an isoflavone found in soy products.

GEOPHAGIA: a common pica of pregnancy involving the consumption of dirt or clay.

GESTATIONAL DIABETES: diabetes that exists only during pregnancy.

GINGER: a botanical that has adjunctive therapeutic use as an antiemetic, reducing nausea, especially associated with motion sickness.

GLAND: an organ that excretes materials and manufactures substances not needed for its own metabolic function.

GLOSSITIS: inflammation of the tongue.

GLUCAGON: a hormone produced by the alpha islets of the pancreas that stimulates the conversion of glycogen to glucose, and gluconeogenesis in the liver to bring about a rise in plasma glucose levels.

GLUCOCORTICOID: the group of corticosteroids predominantly affecting carbohydrate metabolism through promotion of gluconeogenesis and liver glycogen deposition and elevation of blood glucose levels.

GLUCONEOGENESIS: the formation of glucose from noncarbohydrate molecules, such as glycerol and the carbon skeletons of amino acids.

GLUCOSE: the simple sugar formed by the breakdown of complex carbohydrates; blood, corn, grape, or starch sugar.

GLUCOSE TOLERANCE FACTOR (GTF): a potentiator of insulin action, thought to be comprised of niacin, glutathione, and trivalent chromium.

GLUCOSURIA: the presence of sugar in the urine.

GLUTATHIONE: a tripeptide composed of glutamic acid, cysteine, and glycine; it performs three functions: 1) the destruction of peroxides and free radicals; 2) a cofactor for several enzymes; and 3) the detoxification of harmful compounds.

GLUTATHIONE PEROXIDASE: a selenium-containing enzyme that is the major active form of selenium in tissues; participates in antioxidant reactions and protects tissues against damage from free radicals, especially hydrogen peroxide formed within the cell.

GLUTEN-FREE DIET: a restrictive eating pattern in which foods containing the protein gluten are eliminated; these foods include wheat, rye, barley, and oats.

GLUTEN-SENSITIVE ENTEROPATHY (Celiac Disease): a malabsorption syndrome precipitated by the ingestion of gliadin-containing foods (wheat, rye, oats, barley), and characterized by a flattening of the villi of the small intestine.

GLYCEMIC INDEX: a ranking of the effect on blood glucose of the consumption of a single food relative to a reference carbohydrate.

GLYCEROL: a three-carbon alcohol; a sweet oily fluid obtained by the saponification (conversion into soap) of fats and oils.

GLYCOGEN: storage form of carbohydrate in animals. Broken down to yield glucose.

GLYCOGENESIS: the synthesis of glycogen.

GLYCOGENOLYSIS: the splitting up of glycogen in the body tissues, yielding glucose.

GLYCOLIPID: a compound containing an alcohol, fatty acids, and a carbohydrate.

GLYCOLYSIS: the breaking down of glucose to pyruvate (aerobic; with oxygen) or to lactate (anaerobic; without oxygen).

GLYCOPROTEIN: a special class of proteins that have a carbohydrate group attached.

GLYCOSURIA: an abnormally high level of glucose in the urine occurring in diabetes mellitus.

GLYCOSYLATED (or GLYCATED) HEMOGLOBIN: a laboratory test estimating glucose association with hemoglobin; used to examine how well a diabetic is controlling his blood glucose level.

GOITER: a chronic enlargement of the thyroid gland, visible as a swelling at the front of the neck, which is usually associated with iodine deficiency.

GOITROGENIC EFFECT: an effect of substances in some foods (cabbage, turnips, rapeseeds, peanuts, cassava, soybeans) capable of producing goiter.

GOUT: a group of disorders of purine and pyrimidine metabolism characterized by hyperuricemia and deposition of urate crystals in joints.

GRAS (Generally Recognized As Safe): a list, established by the FDA in 1958, of food additives that had long been in use and were believed safe.

GYNOID FAT DISTRIBUTION: deposition of fat in the thighs and buttocks; "pear-shape" fat distribution.

HARD WATER: water containing high concentrations of calcium and/or magnesium.

HAWTHORN: a botanical that has a concentration of flavonoids, particularly oligomeric procyanidins, which affect the cardiovascular system.

HEART DISEASE: includes many diseases of the heart, with coronary heart disease being the most common. Other diseases include arrhythmias, cardiomyopathy, and valve problems.

HEARTBURN: a burning pain in the esophagus caused by the back-flow of gastric contents and acid.

HEAVY METAL: any of a number of mineral ions, such as mercury and lead, so called because they are of relatively high atomic weight. Many heavy metals are poisonous.

HELICOBACTER PYLORI: the pathogenic microorganism associated with the development of atrophic gastritis.

HEMATOCRIT: the volume percentage of RBCs in the blood.

HEMATOPOIESIS: the formation of blood cells in the bone marrow.

HEME: the nonprotein, insoluble iron protoporphyrin constituent of hemoglobin.

HEME IRON: the form in which iron occurs in meat, fish, and poultry.

HEMICELLULOSES (Noncellulose Polysaccharides): a group of high molecular polysaccharides that resemble cellulose but are more soluble and more easily decomposed.

HEMODIALYSIS: removal of certain elements from the blood by virtue of differences in rates of their diffusion across a semipermeable membrane while the blood is being circulated outside the body.

HEMOGLOBIN: the iron-containing pigment in RBCs which carries oxygen to the cells.

HEMOLYSIS: disruption of the integrity of the red blood cell membrane causing release of hemoglobin.

HEMOLYTIC ANEMIA: anemia caused by shortened survival of mature RBCs, sometimes caused by a vitamin E deficiency.

HEMOPROTEIN: protein linked to a metal-porphyrin compound.

HIGH-DENSITY LIPOPROTEIN (HDL): a plasma lipid/protein complex rich in phospholipid and cholesterol; considered to be of benefit in reducing the risk of cardiovascular disease.

HISTAMINE: a chemical in the body tissues that constricts the smooth bronchial tube muscles, dilates small blood vessels, allows fluid leakage to form itchy skin and hives, and increases secretion of stomach acid. It is implicated as the mediator of immediate hypersensitivity.

HOMEOSTASIS: a tendency to stability in the internal environment of the organism; achieved by a system of control mechanisms activated by negative feedback.

HOMOCYSTEINE: an amino acid that functions as an intermediate in the production of methionine and the methyl group donor, *S*-adenosylmethionine; deficiencies of vitamins B6, B12, and folate are associated with hyperhomocysteinemia, an independent risk factor for coronary artery disease.

HONEYMOON PHASE: the period after initial diagnosis of diabetes when there may be some recovery of beta-cell function and a temporary decrease in exogenous insulin requirement.

HORMONE: a chemical substance secreted into the blood stream by one organ which affects the function of another organ.

HORMONE-SENSITIVE LIPASE: an enzyme within the adipose cell that catalyzes the release of free fatty acids from the cell.

HUNGER: craving for food more pronounced than appetite.

HYDROCHLORIC ACID: an acid secreted by the parietal cells in the lining of the stomach that helps in protein digestion.

HYDROGENATION: the process of adding hydrogen to the double bonds and thus increasing the saturation of fatty acids; can convert oils into semi-solids.

HYDROLYSIS: a chemical process whereby a compound is cleaved into two or more simpler compounds. Hydrolysis is effected by the action of acids, alkalies, or enzymes. See digestion.

HYDROPHOBIC: water hating. A substance that does not dissolve in water. Also called lipophilic (fat loving).

HYDROXYAPATITE: a crystalline structure in bone, consisting of calcium phosphate and calcium carbonate in an organic collagen matrix that gives strength and rigidity to bones and teeth.

HYPERCALCEMIA: excess calcium in the blood.

HYPERCALCIURIA: excessive urinary losses of calcium that may occur in individuals who have excessive intestinal absorption of calcium, or who have high-protein intakes, especially from animal protein.

HYPERCAROTENODERMIA: accumulation of carotenoids in the skin with consequent yellowing.

HYPERCHOLESTEROLEMIA: when blood cholesterol is above normal limits.

HYPERGLYCEMIA: increased glucose concentration in the blood above normal limits (≥ 180 mg/dL).

HYPERKALEMIA: abnormally high level of potassium in the blood.

HYPERLIPIDEMIA: excess lipids in the blood.

HYPERLIPOPROTEINEMIA: excess lipoproteins in the blood.

HYPERNATREMIA: high level of sodium in the blood.

HYPERPLASIA: increase in tissue size by an increase in the number of cells.

HYPERTENSION: persistently high arterial blood pressure.

HYPERTROPHY: increase in tissue size by an increase in cell size.

HYPERVITAMINOSIS A: condition resulting from excessive intakes of preformed vitamin A over an extended period; leads to liver damage.

HYPOALLERGENIC: a substance that has a low capacity for inducing hypersensitivity (allergic reaction).

HYPOCALCEMIA: below normal levels of calcium in the blood.

HYPOCHLORHYDRIA: deficiency of hydrochloric acid in the gastric juice.

HYPOCHROMIC: having less than normal color; used to describe a RBC with a below-normal hemoglobin content.

HYPOGLYCEMIA: abnormally low level of sugar in the blood which results in symptoms caused by compensatory sympathetic nervous system activity (≤ 70 mg/dL).

HYPOGLYCEMIA OF NONDIABETIC ORIGIN: low levels of blood glucose that lead to neuroglycopenia symptoms which are ameliorated by the ingestion of carbohydrates.

HYPOKALEMIA: abnormally low level of potassium in the blood.

HYPONATREMIA: low blood sodium level.

HYPOTHALAMUS: a brain center that integrates signals about the blood's temperature, glucose content, and other conditions.

IATROGENIC: disorder caused by a drug, treatment procedure, or diagnostic procedure.

IDIOPATHIC: self-originated; of unknown causation.

ILEUM: the portion of the small intestine extending from the jejunum to the cecum.

IMMUNE SYSTEM: a combination of cells and proteins that assists in the host's ability to fight foreign substances, such as viruses and harmful bacteria; includes the liver, spleen, thymus, bone marrow, and lymphatic system.

IMMUNOGLOBIN: antibodies; specialized proteins with a capacity to combine chemically with the specific antigens stimulation their production.

INDISPENSABLE AMINO ACIDS (Essential Amino Acids): amino acids for which synthesis is inadequate to meet metabolic needs and that must be supplied in the diet. Include: leucine, isoleucine, valine, tryptophan, phenylalanine, methionine, threonine, lysine, histidine.

INFLAMMATORY BOWEL DISEASE (IBD): a general term for inflammatory diseases of the bowel of unknown etiology, including Crohn's disease and ulcerative colitis.

INITIATING EVENT: an event caused by radiation or chemical reaction that can give rise to cancer.

INSENSIBLE WATER LOSS: water lost with air expired from the lungs or sweat evaporated from the skin.

INSOLUBLE FIBER: cellulose and some hemicelluloses that do not dissolve in water.

INSTITUTE OF MEDICINE: A division of the National Academy of Sciences. The mission of the IOM is to advance and disseminate scientific knowledge to improve human health. The Institute provides objective, timely, authoritative information and advice concerning health and science policy to government, the corporate sector, the professions, and the public.

INSULIN: a pancreatic hormone that promotes glucose utilization, protein synthesis, and the formation and storage of neutral lipids.

INSULIN-DEPENDENT DIABETES MELLITUS (Type 1): diabetes usually occurring in childhood and characterized by abrupt onset of symptoms: insulinopenia, dependence on exogenous insulin to sustain life, and a tendency to develop ketoacidosis; usually occurs before 30 years of age.

INSULIN RESISTANCE: an impaired biologic response to either exogenous or endogenous insulin; insulin resistance and insulin deficiencies are usual causes of Type 2 diabetes.

INTERCELLULAR: between the cells.

INTERCELLULAR (INTERSTITIAL) WATER: the water between and around the cells.

INTERMITTENT CLAUDICATION: a complex of symptoms characterized by absence of pain or discomfort in a limb when at rest, and severely increasing pain during walking.

INTESTINAL FLORA: the bacteria normally present in the intestines.

INTESTINAL MOTILITY: the rhythmic contractions of the intestinal muscle layer that move the intestinal contents along the passageway.

INTRACELLULAR: within the cell.

INTRINSIC FACTOR: a glycoprotein secreted by the gastric glands necessary for the absorption of vitamin B12; its secretion is impaired in pernicious anemia.

IODOPSIN: the light-sensitive pigment of the cones in the retina.

ION: an atom or molecule that has acquired a net electric charge by gaining or losing electrons.

IRRITABLE BOWEL SYNDROME (IBS): an abnormal stooling pattern associated with symptoms of intestinal dysfunction that persists for longer than 3 months.

ISCHEMIA: deficiency of blood in a tissue, due to functional constriction or actual obstruction of a blood vessel.

ISCHEMIC HEART DISEASE: damage to the heart from a decreased blood supply and insufficient oxygen.

ISOFLAVONES: a subclass of phenol phytochemicals, found in beans and other legumes (esp. soy), that may have cancer-preventing properties, especially against hormone-driven cancers.

JAUNDICE (Icterus): yellowish discoloration of skin, mucous membranes, and certain body fluids caused by an accumulation of bile pigments in the blood, either from reduced excretion resulting from failure of the liver, or from increased production of bile pigments from hemoglobin.

JEJUNUM: the section of the small intestine between the duodenum and the ileum.

KERATIN: a water-insoluble protein found in hair and nails.

KETOACIDOSIS: a pathologic condition resulting from the accumulation of acid accompanied by the presence of ketone bodies.

KETONES: compounds derived from the oxidation of a secondary alcohol; produced when the body is relying almost entirely on stored fat for energy, such as in uncontrolled diabetes mellitus, or prolonged fasting or starvation.

KETOSIS: clinical condition in which ketone bodies accumulate in the blood and appear in the urine; acetone odor is apparent in the breath.

KILOCALORIE (KCAL OR CAL): 1,000 calories (small “c” calories); sometimes written as Calorie (big “C” calorie). Usually in nutrition, whether the “C” in calorie is capitalized or not, it means kilocalorie. The term kilocalorie is less confusing.

KREBS CYCLE: also called tricarboxylic acid cycle (TCA) or citric acid cycle; the main source of energy in the mammalian body, and the end toward which carbohydrate, fat, and protein metabolism are directed.

KWASHIORKOR: a form of protein-energy malnutrition associated with extreme dietary protein deficiency and characterized by hypoalbuminemia, edema enlarged fatty liver.

LABILE: Likely to undergo chemical change; unstable; labile nutrients are affected by light, oxygen, heat, etc.

LACTALBUMIN: protein found in the whey component of milk.

LACTASE: the intestinal enzyme that hydrolyzes lactose to glucose and galactose; necessary for digestion of milk and milk products.

LACTIC ACID: a product from glucose metabolism in anaerobic metabolism.

LACTOBACILLUS ACIDOPHILUS: a bacterium that can reside in the colon and inhibit the growth of bacteria that might be harmful. In milk or yogurt, reduces the lactose level.

LACTOOVOVEGETARIAN: a vegetarian who consumes dairy foods and eggs in addition to plant foods.

LACTOVEGETARIAN: a vegetarian who consumes dairy foods in addition to plant foods.

LACTASE: the intestinal enzyme that hydrolyzes lactose to glucose and galactose.

LACTOBACILLUS: a beneficial intestinal organism that produces organic acids which retard the growth of pathogenic bacteria.

LACTOSE: a disaccharide composed of glucose and galactose; the principal sugar found in mammalian milk.

LACTOSE INTOLERANCE: an inability to digest lactose to galactose and glucose because of a deficiency of lactase.

LEAN BODY MASS (LBM): the total of all body components except storage lipid.

LECITHIN (Phosphatidylcholine): a choline-containing phospholipid that is found in all plant and animal tissues, and frequently functions as an emulsifier.

LEGUMES: the fruit or pod of beans, peas, lentils, etc.

LESION: a wound or injury; a pathological alteration of tissue.

LEUKOCYTE: white blood cell; classified as granular or nongranular.

LEUKOPENIA: a reduction in the number of white blood cells in the blood.

LEUKOTRIENE: an eicosanoid whose function is the communication among the various types of cells involved in immunosurveillance, inflammation, protection against infection, and immune responses.

LIGAND: an organic molecule that donates the necessary electrons to form coordinate covalent bonds with metallic ions; for example, as oxygen is bound to the central iron atom of hemoglobin.

LIGNANS: phytoestrogens, found in flaxseeds, wheat bran, and other whole grains, that affect sex hormone metabolism and may reduce the risk of hormone-linked cancer.

LIGNIN: a noncarbohydrate material sometimes included in fiber determination that is a major component of the woody portion of plants.

LIMITING AMINO ACID: the essential amino acid found in the shortest supply relative to the amounts needed for protein synthesis in the body.

LIMONOIDS: a subclass of terpenes found in citrus fruits; identified as chemopreventive agents that induce enzymes in the liver's phase I and II enzyme detoxification system.

LINOLEIC ACID: an essential fatty acid; a polyunsaturated fatty acid with 2 double bonds and 18 carbon atoms, found in linseed (flax seed), safflower, cottonseed, soybean, corn, and fish oils and in animal tissues.

LINOLENIC ACID: polyunsaturated fatty acid with growth-promoting effect; contains three double bonds and 18 carbon atoms, and can be synthesized in the body from linoleic acid.

LIPASE: an enzyme in pancreatic juice that digests fats.

LIPID: any of numerous fats (and oils) and fat-like materials that are generally insoluble in water, but soluble in common organic solvents; by definition, fats are solid at room temperature and oils are liquid at room temperature.

LIPOGENESIS: the transformation of nonfat food materials into body fat.

LIPOIC ACID (lipoate; lipoamide): classified as a sulfur-containing fatty acid; a component of the enzyme that converts pyruvate to acetyl CoA. Is also both a water- and fat-soluble antioxidant.

LIPOLYSIS: the breaking down of fat.

LIPOPHILIC: fat loving. A substance that dissolves in fat. Also called hydrophobic (water hating).

LIPOPROTEIN: a combination of a lipid and protein, possessing the solubility of proteins; lipoproteins act as agents of lipid transport in the lymph and blood; chylomicrons, HDL, VLDL, LDL.

LIPOPROTEIN LIPASE: an enzyme that catalyzes the hydrolysis of fats present in chylomicrons and lipoproteins; found in various tissues and important in mobilization of fatty acids from depot fats.

LIPOTROPIC: pertaining to substances preventing or correcting the fatty liver of choline deficiency.

LISTERIOSIS: infection by listeria bacteria; produces diarrhea, vomiting, meningitis, and endocarditis.

LONG-CHAIN FATTY ACID: a fatty acid containing 13 to 27 carbons; 16 to 18 are most common.

LOW-DENSITY LIPOPROTEIN (LDL): a lipid/protein complex circulating in the plasma, transporting most of the blood cholesterol. This lipoprotein fraction is implicated in the risk of cardiovascular disease.

LUMEN: the inner open space of a tubular organ, as of a blood vessel or an intestine.

LYCOPENE: one of the carotenoid phytochemicals found in tomatoes that acts as a free radical scavenger.

LYMPH: a clear fluid that flows through lymph vessels and is collected from the tissues throughout the body; its function is to nourish tissue cells and return waste matter to the blood stream.

LYMPH GLANDS: located along the lymph vessels, they trap foreign material and produce lymphocytes.

MACROBIOTIC VEGETARIAN: persons who consume vegan or vegetarian diets which also involve non-animal food avoidances and extensive use of unprocessed, unrefined foods, especially brown rice and other whole grains.

MACROCYTIC ANEMIA: anemia characterized by larger than normal RBCs, increased mean corpuscular volume, and mean corpuscular hemoglobin.

MACROMINERAL: a naturally occurring, homogeneous, inorganic substance required by humans in amounts of 100 mg or more per day; calcium, phosphorus, magnesium, sulfur, sodium, chloride, potassium.

MALABSORPTION: abnormal or inadequate gastrointestinal absorption of nutrients.

MALTASE: the intestinal enzyme that hydrolyzes maltose into glucose units.

MALTOSE (MALT SUGAR): a disaccharide composed of two glucose units.

MANNITOL: a sugar alcohol that exists in fruit, is poorly digested, and yields about half as many calories as glucose.

MARASMUS: a chronic form of protein-energy malnutrition in which the deficiency is primarily of energy.

MEDIUM-CHAIN FATTY ACID: a fatty acid with 8 to 12 carbons.

MEDIUM-CHAIN TRIGLYCERIDES: triacylglycerols with fatty acids of 8 to 12 carbons in length that are short enough to be absorbed directly into the portal blood.

MEGALOBLASTIC ANEMIA: anemia characterized by the presence of large, immature, abnormal RBC progenitors in the bone marrow; characteristic of a folic acid or vitamin B12 deficiency.

MELANIN: a dark pigment found in the skin, retina, and hair.

MENADIONE: synthetic form of vitamin K.

MENAQUINONE: vitamin K synthesized by bacteria.

MENOPAUSE: the period of cessation of menstruation, occurring around age 50.

METABOLIC RATE: an expression of the rate at which oxygen is used by the body.

METABOLISM: the chemical processes consisting of anabolism and catabolism; responsible for the production of energy, biosynthesis of important substances, and degradation of various compounds.

METALLOTHIONEIN: an abundant nonenzymatic zinc-containing protein.

METHYL: CH_3 , derived from methane and occurring in many important organic compounds.

MICELLE: a particle containing lipids and bile salts that moves fatty acids from the intestinal lumen to the intestinal mucosa for absorption.

MICROCYTIC ANEMIA: anemia characterized by smaller than normal erythrocytes and less circulating hemoglobin; usually caused by a deficiency of iron.

MICROMINERAL (Trace Element): a naturally occurring, homogeneous, inorganic substance required by humans in amounts of less than 100 mg per day.

MICROVILLI: projections from the membranes of the cells of the villi; area of nutrient absorption.

MILK-ALKALI SYNDROME: a condition of alkalosis brought about by very excessive consumption of milk, calcium-containing antacids, or other alkaline substances; most likely to occur in older people with peptic ulcer.

MINERALOCORTICOID: adrenocortical hormones that regulate electrolyte balance; aldosterone is the most potent.

MITOCHONDRIA: organelles that are the principal energy source of the cell, and contain the cytochrome enzymes of terminal electron transport, and the enzymes of the Krebs cycle, fatty acid oxidation (beta-oxidation), and oxidative phosphorylation.

MODIFIED FOOD STARCH: starch that has been treated with a variety of chemicals so that it can still function as a thickening agent but can also form solutions with cold water that maintain stability in the presence of acid, freezing, and thawing.

MOLECULE: the simplest structural unit that displays the characteristic physical and chemical properties of a compound.

MONOGLYCERIDE: a lipid with one fatty acid attached to the glycerol molecule.

MONOSACCHARIDE: a sugar incapable of being digested to a simpler form; glucose, fructose, galactose.

MONOUNSATURATED FATTY ACID (MUFA): a fatty acid containing one double bond.

MORBID OBESITY: a state of adiposity in which body weight is 100% above the idea.

MUCOPOLYSACCHARIDE: a compound comprising protein and carbohydrate found in connective tissue, collagen, and bone matrix; a more modern term is glycosaminoglycan.

MUCOUS MEMBRANE: the membrane lining all bodily channels that communicate with the air, such as the respiratory, and alimentary tracts, the glands of which secrete mucus.

MUCUS: a mucopolysaccharide (a relative of carbohydrate) secreted as a protective, lubricant coating by glands in the mucous membrane.

MUSCULAR DYSTROPHY: an inherited disease in which the muscles gradually weaken.

MUTAGENIC: capable of producing changes in DNA or chromosomal structure, resulting in permanent alteration in the genetic information carried by DNA.

MYALGIA: pain in a muscle or muscles.

MYOCARDIAL INFARCTION: heart attack; condition resulting from the occlusion of a coronary artery and interruption of the blood supply to cardiac tissue.

MYOGLOBIN: a ferrous protoporphyrin protein, similar to hemoglobin, that is present in muscle and stores oxygen.

MYOPATHY: any disease of the muscle.

MYXEDEMA: a disease caused by decreased activity of the thyroid gland in adults; characterized by dry skin, swellings around the lips and nose, mental deterioration, and a subnormal basal metabolic rate.

NECROTIZING ENTEROCOLITIS: a disease seen in infants which involves degeneration of a part of the intestinal tract.

NEOPLASM: an abnormal new growth of tissue; tumor.

NEPHRITIS: kidney disease resulting in some loss of function.

NEPHROSIS: any disease of the kidney, but especially when characterized by purely degenerative lesions of the renal tubules.

NET PROTEIN UTILIZATION (NPU): a measure of protein quality; the amount of protein nitrogen that is retained from a given amount of protein nitrogen eaten.

NEUROGLYCOPENIA: neurological symptoms of hypoglycemia that are related to an insufficient supply of glucose to the brain.

NEUROPATHY: noninflammatory lesions related to functional disturbances in the peripheral nervous system.

NEUROTRANSMITTER: any chemical that results in the transmission of nerve impulses between neurons in the brain and nerves.

NEUTROPENIA: a reduction in the blood neutrophil (granulocyte) count often leading to an increased susceptibility to bacterial and fungal infections.

NEUTROPHIL: a granular leukocyte.

NIACIN EQUIVALENT (NE): Equals the amount of preformed niacin in food, plus the amount that can be converted from the amino acid, tryptophan.

NICOTINAMIDE: niacinamide; a form of vitamin B3 that doesn't cause a flush.

NICOTINIC ACID: niacin; vitamin B3.

NIGHTBLINDNESS: poor vision in dim light or at night as a result of vitamin A deficiency.

NITROGEN BALANCE: relating to protein, it is the amount of nitrogen consumed as compared with the amount of nitrogen excreted in a given period of time.

NITROSAMINES: carcinogenic derivatives of nitrites that may be formed in the stomach when nitrites combine with amines.

NONHEME IRON: the form of iron found in eggs, grains, vegetables, and fruits, and which is less well absorbed than heme iron.

NON-INSULIN-DIABETES MELLITUS (Type 2): diabetes characterized by a gradual onset with minimal or no symptoms of metabolic disturbance and no requirement for exogenous insulin to prevent ketonuria and ketoacidosis; usually occurs after 30 years of age.

NOREPINEPHRINE: hormone produced by the adrenal medulla that increases blood pressure by constricting the blood vessels; released predominantly in response to hypotension.

NORMOCHROMIC: normal color.

NORMOCYTIC: normal size.

NONSTEROIDAL ANTI-INFLAMMATORY DRUG (NSAID): type of drug used to treat osteoarthritis, rheumatoid arthritis, and other pain; available over the counter as aspirin, acetaminophen (e.g., Tylenol), propionic acids (e.g., Ibuprofen), and other classes.

NUCLEIC ACID: a member of either of two groups of complex compounds found in all living cells, and composed of purines, pyrimidines, carbohydrates, and phosphoric acid.

NUCLEOPROTEIN: any of a group of substances found in all living cells and viruses, and composed of a protein and a nucleic acid.

NUTRIENT: a substance obtained from food and used in the body to promote growth, maintenance, and/or repair. The six classes of nutrients are carbohydrate, fat, protein, vitamins, minerals, and water.

NUTRIENT DENSITY: the concentration of nutrients in a food. The higher the nutrient density, the higher the food quality.

OBESITY: a state of adiposity in which body fatness is at least 20% above the ideal.

OCCCLUSION: the shutting off of the blood flow in an artery.

OLEIC ACID: an 18-carbon, monounsaturated fatty acid.

OLIGOSACCHARIDE: a carbohydrate that upon hydrolysis yields 3 to 10 monosaccharide units.

OMEGA NUMBER: the number of the carbon molecule with the first double bond, as counted from the methyl end of the fatty acid; for example, written as n-3 or ω -3 (or n-6 or ω -6).

OMEGA-3 FATTY ACIDS (n-3 or ω -3): fatty acids with the first double bond located at the third carbon from the methyl end of the hydrocarbon chain; most important are alpha-linolenic acid (ALA) found in flax seed oil, and its derivatives eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) found in fish oils.

OMEGA-6 FATTY ACIDS (n-6 or ω -6): fatty acids with the first double bond located at the sixth carbon from the methyl end of the hydrocarbon chain; most important is gamma-linolenic acid (GLA) found in evening primrose and borage seed oils.

OPSIN: the protein of the visual pigments. Vitamin A is a helper nutrient, attached to opsin to form the pigment, rhodopsin.

ORAL GLUCOSE-LOWERING MEDICATIONS: drugs, administered orally, that are used to control or lower blood glucose levels, including first- and second-generation sulfonylureas, biguanides, alpha-glucosidase inhibitors, thiazolidinediones, and meglitinide.

ORGANELLE: a specialized part of a cell that resembles and functions as an organ.

ORGANIC: denoting chemical substances containing carbon.

OSSIFICATION: the natural process of bone formation.

OSTEOARTHRITIS (Degenerative Arthritis): noninflammatory degenerative joint disease occurring mainly in older persons, characterized by degeneration of the joint cartilage, hypertrophy of bone at the margins, and changes in the synovial membrane.

OSTEOMALACIA: a condition of impaired mineralization of the bones caused by vitamin D and calcium deficiencies.

OSTEOPENIA: insufficiency of bone resulting from reduced production or increased breakdown of the bone.

OSTEOPOROSIS: a loss of bone density to the point that the skeleton is unable to sustain ordinary stresses, and fractures develop.

OXALIC ACID: an organic acid found in certain leafy vegetables (rhubarb, spinach, chard, beet greens) that binds with calcium and inhibits its absorption from these foods.

OXIDANT: the substance that is reduced and that, therefore, oxidizes the other component of an oxidation-reduction system; may cause the production of free radicals.

OXIDATION: a reaction in which electrons are removed from a molecule. Usually the combination of a substance with oxygen.

OXIDATIVE STRESS: the balance between the formation of toxic, free radical oxidation products and the biochemical reduction reactions that convert these compounds to benign end products.

PANCREATIC LIPASE: an enzyme in pancreatic juice that hydrolyzes the ester linkages between fatty acids and glycerol.

PARASYMPATHETIC NERVOUS SYSTEM: the part of the autonomic nervous system that, in general, inhibits or opposes the physiological effects of the sympathetic nervous system, as in tending to stimulate digestive secretions, slowing the heart, and dilating blood vessels.

PARATHYROID HORMONE (PTH): controls the calcium level in the blood. Secreted by the parathyroid gland.

PARENTERAL NUTRITION: the delivery of nutrients directly into the circulation; can be either peripheral or central, total or supplemental.

PARIETAL CELLS: large cells scattered along the walls of the stomach that secrete the hydrochloric acid in gastric juice.

PASSIVE DIFFUSION: the random movement of particles through openings in cellular membranes depending on electrochemical and concentration gradients.

PECTIN: a noncellulose polysaccharide made up of units of a derivative of galactose that is found in fruit.

PELLAGRA: niacin deficiency disease.

PEPSIN: a digestive enzyme found in gastric juice that catalyzes the breakdown of protein to peptides.

PEPTIC ULCER: an eroded lesion in either the esophageal, gastric, or duodenal mucosa resulting from the action of acid in gastric juice.

PEPTIDE: any compound of low molecular weight that yields two or more amino acids on hydrolysis; constituent part of proteins.

PERISTALSIS: the movement of the intestine, or other tubular structure, characterized by waves of alternate circular contraction and relaxation of the tube by which the contents, such as food, are propelled onward.

PERNICIOUS ANEMIA: a macrocytic, megaloblastic anemia caused by a deficiency of vitamin B12.

PEROXIDATION: the addition of an oxygen atom at a double bond in an unsaturated fatty acid; can occur in the body or in food; can be caused by certain free radicals.

pH: the concentration of hydrogen ions (H^+); the lower the pH, the stronger the acid.

PHENOLS: a class of phytochemicals that function in plants as blue, blue-red, and violet pigments and that provide protection against oxidative damage.

PHENYLKETONURIA (PKU): an inherited disease caused by a lack of an enzyme necessary for converting the amino acid, phenylalanine, into the amino acid, tyrosine.

PHLEBITIS: inflammation of a vein; marked by infiltration of the coats of the vein and by the formation of a thrombus.

PHOSPHOLIPID: a triglyceride in which one of the fatty acids is replaced by a substance containing phosphorus; lecithin is a common phospholipid.

PHYLLOQUINONE: vitamin K from plants.

PHYTIC ACID (Phytate): a phosphorus-containing compound found in the outer husks of cereal grains that binds with calcium and inhibits its absorption.

PHYTOCHEMICALS: biologically active, naturally occurring substances in plants that act as natural defense systems in plants and that show potential for reducing risk for cancer and cardiovascular disease.

PHYTOESTROGENS: phytochemicals that are non-steroidal estrogens of dietary origins; structurally similar to estrogens, they act in the body as weak estrogens and anti-estrogens.

PICA: an abnormal craving to consume unusual substances such as clay, chalk, laundry starch, and dirt.

PLACEBO: an inert, harmless medication given to provide comfort and hope.

PLAQUE: a patch or small differentiated area on a body surface (e.g., skin, mucosa, or arterial endothelium) or on the cut surface of an organ such as the brain. In terms of heart disease, refers to mounds of lipid material, mixed with smooth muscle cells and calcium, which are lodged in the artery walls.

PLASMA: the clear, yellowish fluid portion of blood, lymph, or intramuscular fluid in which cells are suspended.

POLYDIPSIA: chronic, excessive thirst, as seen in diabetes mellitus or diabetes insipidus.

POLYMER: any of numerous natural and synthetic compounds of usually high molecular weight consisting of up to millions of repeated linked units, each a relatively light and simple molecule.

POLYP: in the colon, a mushroom-like growth that can progress to cancer.

POLYPEPTIDE: ten or more amino acids bonded together by peptide bonds.

POLYSACCHARIDE: a carbohydrate that upon hydrolysis yields more than 10 monosaccharide units.

POLYUNSATURATED FATTY ACID (PUFA): a fatty acid containing two or more double bonds; common in vegetable oils.

POLYURIA: excessive urination; common in diabetes.

POSTMENOPAUSAL OSTEOPOROSIS (Type I): a loss of density primarily involving the trabecular bone and characterized by fractures of the distal radius and crush fractures of the lumbar vertebrae.

POSTPRANDIAL: after a meal.

POSTPRANDIAL (REACTIVE) HYPOGLYCEMIA: low blood glucose within 2 to 5 hours after eating.

PRECURSOR: a substance from which another, usually more active or mature substance is formed.

PREBIOTICS: nondigestible food products that stimulate the growth of symbiotic bacterial species already present in the colon; they help to improve the health of the host.

PREECLAMPSIA: the early stage of pregnancy-induced hypertension.

PREFORMED VITAMIN A: form of vitamin A present in animal foods.

PROBIOTICS: microbial foods or supplements that can be used to change or reestablish the intestinal flora and improve the health of the host.

PROGRAM THEORY: a theory of aging that proposes that cells are capable of reproducing themselves for a programmed, finite number of times, after which they die.

PROMOTER: a substance that does not initiate cancer, but that favors its development once the initiating event has taken place.

PROSTACYCLIN: prostaglandin I₂; a potent natural inhibitor of platelet aggregation and a powerful vasodilator.

PROSTAGLANDIN: any of a class of physiologically active hormone-like substances present in many tissues, with effects such as vasodilation, vasoconstriction, stimulation of intestinal or bronchial smooth muscle, uterine stimulation, and antagonism to hormones influencing lipid metabolism; produced in the body from omega-3 (n-3) and omega-6 (n-6) polyunsaturated fatty acids.

PROSTHETIC GROUP: a coenzyme that is physically part of its enzyme.

PROTEASE: an enzyme that breaks peptide bonds found in protein.

PROTEIN: a complex nitrogenous compound made up of amino acids in peptide linkages; involved in structures, hormones, enzymes, muscle contraction, immunological response.

PROTEIN EFFICIENCY RATIO (PER): a measure of protein quality; the grams of weight gained by growing animals per gram of protein fed.

PROTEIN ENERGY MALNUTRITION: a class of clinical disorders resulting from varying combinations and degrees of protein and energy deficiency; infants and children are particularly vulnerable; early symptoms include loss of appetite, easy fatigability, loss of weight, and retarded growth. Also called protein-calorie malnutrition.

PROTEIN-SPARING ACTION: the contribution of nutrients from carbohydrate and fat that allow amino acids to be used to build body proteins.

PROTEIN TURNOVER: the exchange of amino acids among organs within the body.

PROTEOLYTIC: relating to or effecting the decomposition of protein; proteolytic enzymes digest food proteins.

PROTHROMBIN: the protein in blood plasma needed for blood clotting.

PROVITAMIN: a dietary precursor to an active form of a vitamin.

PSORIASIS: a chronic, noncontagious skin disease characterized by inflammation and white, scaly patches.

PTEROYLGLUTAMIC ACID: folic acid.

PURINES: the nitrogenous bases, adenine and guanine, which are constituents of nucleoproteins, whose metabolic end-product is uric acid.

PUTREFACTION: enzymatic decomposition of proteins with the production of foul-smelling compounds, such as hydrogen sulfide, ammonia, and mercaptans.

PYRIDOXAL PHOSPHATE (PLP): a coenzyme containing vitamin B6 that is necessary for transamination reactions.

PYRUVATE: the end product of glycolysis; can be converted into lactate or acetyl CoA.

RANCID: having a musty, rank taste or smell due to fats that have oxidized and decomposed with the liberation of fatty acids.

REACTIVE POSTPRANDIAL HYPOGLYCEMIA: abnormally low concentration of blood glucose within 2 to 5 hours after eating.

RECOMMENDED DIETARY ALLOWANCES (RDA): recommendations for the average amounts of nutrients that should be consumed daily by healthy people in the US.

RECEPTOR SITE: a chemical structure on the cell membrane where a hormone or antigen binds.

RED BLOOD CELL (RBC): hemoglobin-enriched blood cells responsible for the transport of oxygen from the lungs to tissues.

REDOX: oxidation-reduction.

REDUCED: altered by a chemical change involving a gain of electrons.

REFERENCE DAILY INTAKES (RDIs): set of dietary references for food labels based on the 1968 RDAs for vitamins and minerals, this term replaces the U.S. RDA previously used with nutrition labeling on food products.

REFERENCE PROTEIN: egg protein; used by FAO/WHO as a standard against which to measure the quality of other proteins.

REFINED FOOD: a food from which the coarse parts have been removed. With respect to grains, a product from which the bran, germ, and chaff have been removed.

RENAL INSUFFICIENCY: inability of the kidney to excrete waste materials and conserve water, electrolytes, and other important molecules to the extent needed.

RESORPTION (Bone): the loss of bone matrix and mineral.

RESTING ENERGY EXPENDITURE (REE): the amount of energy used by a person in 24 hours when at rest, 3 to 4 hours after a meal.

RESTING METABOLIC RATE (RMR): the energy expended by a person at rest, expressed as kcal per kg of body weight per hr.

RETINA: the layer of light-sensitive cells lining the back of the inside of the eye; consists of rods and cones.

RETINAL: the aldehyde form of vitamin A, active in the eye.

RETINOL: the form of vitamin A with the highest biologic activity.

RETINOL EQUIVALENT: a measure of the vitamin A activity in foods.

RHEUMATOID ARTHRITIS: chronic inflammatory systemic disease primarily of the joints, marked by changes in the synovial membranes and joint structures, and by atrophy and rarefaction of the bones.

RHODOPSIN: the light-sensitive pigment of the rods in the retina.

RIBONUCLEIC ACID (RNA): a nucleic acid found in all cells, consisting of ribose, phosphate, and the bases adenine, guanine, cytosine, and uracil.

RICKETS: a disease of abnormal ossification of the bone caused by a deficiency of vitamin D; occurs in growing children.

RODS: the cells of the retina that respond to dim light and convey black and white vision.

ROTATION DIET: an eating plan in which several foods known to cause allergic reactions or which are not tolerated, are eaten on separate days, and then only every fourth or fifth day for each food.

SACCHARIDES: carbohydrates; classified as mono-, di-, tri- and polysaccharides according to the number of monosaccharide groups composing them.

SALMONELLOSIS: any disease caused by a salmonella infection, which may manifest as food poisoning with acute gastroenteritis, vomiting, and diarrhea.

SALT-SENSITIVE HYPERTENSION: hypertension that appears to respond to salt intake.

SAPONIFICATION: the process of hydrolyzing fats into soaps and glycerol by the addition of alkali.

SATIETY: the condition of being full or gratified beyond the point of satisfaction.

SATURATED FATTY ACID (SFA): a fatty acid with the formula $C_nH_{2n}O_2$ that has no double bonds and that contains all the hydrogen it can hold.

SCURVY: vitamin C deficiency disease.

SECRETIN: a hormone released from the duodenal wall into the bloodstream, which stimulates the pancreas to secrete water and bicarbonate and inhibits gastrin secretion.

SENILE DEMENTIA OF THE ALZHEIMER TYPE (SDAT): degenerative brain disease occurring beyond middle age and resulting in changes in behavior and in loss of memory, cognitive function, and speech.

SENSITIZATION: exposure to an antigen or allergen that results in the development of hypersensitivity.

SEROTONIN: a neurotransmitter produced from the amino acid, tryptophan, that assists in relaxation and sleep.

SERUM: the cell-free fluid that remains after the fibrin clot and blood cells are removed.

SET-POINT THEORY: the theory that a certain body weight is physiologically normal for each person, and that the body will resist deviation from that weight.

SHORT-CHAIN FATTY ACID: a fatty acid with 6 carbons or less.

SIMPLE CARBOHYDRATE: a simple form of sugar (mono- and disaccharides): glucose, fructose, galactose, sucrose, lactose, maltose, and other “oses”.

SIMPLE PROTEINS: proteins such as globulins and albumins that yield only amino acids on hydrolysis.

SOFT WATER: water containing a high sodium concentration.

SOLUBLE FIBER: pectins, gums, mucilages, and some hemicelluloses that form gels with water, and contribute to the lowering of serum cholesterol levels.

SOMOGYI (REBOUND) EFFECT: hypoglycemia followed by “rebound” hyperglycemia caused by an overproduction of counter-regulatory hormones; insulin does should not be increased at this time.

SORBITOL: a sugar alcohol occurring naturally in fruits; in mammals is found in some tissues such as the lens of the eye.

SPASTIC COLON: increased or uncontrolled contractions of the colon; irritable bowel syndrome.

SPORTS ANEMIA: a transient anemia seen in heavily training athletes characterized by a decrease in the RBC count, hemoglobin concentration, and packed cell volume, but with normal RBC morphology.

STARCH: a polysaccharide, composed of glucose, found only in plants. It occurs in both the amylose form and the amylopectin form.

STEATORRHEA: excessive amounts of fat in the feces, as seen in malabsorption syndromes.

STEROL: a compound composed of carbon, hydrogen, and oxygen atoms arranged in rings like those of cholesterol.

STOMATITIS: inflammation of the oral mucosa or soft tissues of the mouth.

SUCRASE: the intestinal enzyme that hydrolyzes sucrose to glucose and fructose.

SUCROSE: ordinary table sugar; a disaccharide composed of glucose and fructose found in sugar cane, sugar beets, molasses, maple syrup, maple sugar, fruit, vegetables, and honey.

SUGAR ALCOHOLS: sugar-like substances (mannitol, sorbitol, xylitol) which are derived from fruits or dextrose; they are absorbed slower and metabolized differently than other sugars, and are not readily used by ordinary mouth bacteria.

SUPEROXIDE DISMUTASE (SOD): an enzyme protecting against damage from accumulating superoxide radical by reducing the radical to hydrogen peroxide and oxygen; requires copper, zinc, or manganese.

SYMPATHETIC NERVOUS SYSTEM: the portion of the autonomic nervous system that opposes the parasympathetic nervous system.

SYNAPSE: the gap between one nerve cell and the next nerve cell it communicates with. Neurotransmitters are the agents that facilitate the communication.

SYNDROME: a group of signs and symptoms that collectively indicate or characterize a disease, psychological disorder, or other abnormal condition.

SYNDROME X: a cluster of metabolic disorders, including non-insulin-dependent diabetes mellitus, hypertension, and dyslipidemia, that is characterized by insulin resistance.

SYNERGIST: a structure, agent, or physiologic process that aids the action of another.

SYNOVIAL FLUID: a clear, viscid, lubricating fluid secreted by membranes in joint cavities, sheaths of tendons, and bursae.

SYNTHESIS: the process of building up; the formation of complex compounds from simpler compounds.

TACHYCARDIA: rapid heart rate, usually above 100 beats per minute.

TERATOGEN: an agent or disease state capable of causing congenital malformations and other serious deviations from normal fetal development.

TETANY: muscle twitching, spasms, and eventually convulsions that can be caused by low levels of blood calcium or magnesium.

THERMIC EFFECT OF FOOD (TEF): the fraction of the total energy expenditure contributed by the processes of digestion, absorption, and metabolism of food; the increase in metabolism that is stimulated by eating.

THERMOGENESIS: the production of heat in organisms.

THIOL: a sulfur-containing phytonutrient found in cruciferous vegetables.

THROMBOXANE: an eicosanoid that is a potent inducer of platelet aggregation; also a vasoconstrictor, it is a physiologic antagonist to prostacyclin.

THROMBUS: a stationary clot; can grow large enough to close off a blood vessel.

THYROXIN: an iodine-containing hormone secreted by the thyroid gland to regulate the rate of cell metabolism (basal metabolic rate).

TISSUE: a collection of similar cells and the intercellular substances surrounding them. There are four basic tissues in the body: 1) epithelium; 2) the connective tissues, including blood, bone, and cartilage; 3) muscle tissue; and 4) nerve tissue.

TOCOPHEROL: vitamin E.

TOCOPHEROL EQUIVALENT (TE): basis for expressing the vitamin E activity of compounds as compared to the activity of 1 mg (1.49 I.U.) of alpha-tocopherol (natural vitamin E).

TOLERABLE UPPER INTAKE LEVEL (UL): the maximum level of daily nutrient intake that is unlikely to impose risks of adverse health effects to almost all of the individuals in the general population.

TOTAL ENERGY EXPENDITURE (TEE): the sum of the resting energy expenditure, energy expended in physical activity, and the thermic effect of food; the energy expended by an individual in 24 hours.

TRABECULAR BONE (Cancellous Bone): the spongy bone in the knobby ends of the long bones, the iliac crest, scapula, and vertebrae.

TRANSAMINATION: the transfer of an amino group from an alpha-amino acid to an alpha-keto acid; requires vitamin B6.

TRANS FATTY ACIDS: stereoisomers of the naturally occurring *cis* fatty acids; artifacts of the hydrogenation process; found in margarines and vegetable shortenings.

TRANSFERRIN: a protein synthesized in the liver that transports iron in the blood to the erythroblasts for use in heme synthesis.

TRANSIT TIME: the interval between the time when food is ingested and when the residue of that digested food is evacuated from the rectum.

TRANSKETOLASE: an enzyme essential in carbohydrate metabolism that requires thiamin (B1) as a coenzyme.

TRIGLYCERIDE (TRIACYLGLYCEROL): a lipid consisting of three fatty acid chains bound (esterified) to a glycerol molecule.

TRYPEPTIDE: three amino acids bonded together by peptide bonds.

TROPHIC EFFECTS: the stimulation of cell reproduction and enlargement.

TYRAMINE: an amino acid that can be synthesized in the body from tyrosine and stimulates the release of epinephrine and norepinephrine; also found in various food products, including aged cheeses and red wine; may cause migraine headaches.

TRYPTOPHAN: an amino acid that serves as the metabolic precursor of niacin.

TYPE 1 DIABETES: current term for insulin-dependent diabetes mellitus (IDDM).

TYPE 2 DIABETES: current term for non-insulin-dependent diabetes mellitus (NIDDM).

ULCERATIVE COLITIS: chronic, recurrent ulceration of the mucosa and submucosa in the colon.

UNDERWEIGHT: a body weight 15% to 20% below the accepted weight standard.

UREA: the chief nitrogenous end-product of protein metabolism, and the chief nitrogenous constituent of urine.

UREMIA: an excess of urea in the blood.

URETHRA: the tube through which urine from the bladder passes out of the body.

URP (Unique Radiolytic Product): a product formed during the irradiation of food.

URTICARIA: a skin condition characterized by intensely itching welts; caused by allergic reactions to internal or external agents, by infections, or by psychic stimuli.

VASOCONSTRICTOR: agent that causes the blood vessels to decrease in diameter.

VASODILATOR: agent that causes blood vessels to increase in diameter.

VEGAN: a person who consumes only foods of plant origin and excludes all animal protein from the diet.

VEGETARIAN: a person who consumes primarily plant foods (grains, legumes, vegetables, and fruits) and eliminates meats, poultry, and fish from the food pattern; dairy foods and eggs may be consumed.

VEIN: a vessel that carries blood back to the heart.

VERY LOW-DENSITY LIPOPROTEIN (VLDL): a triglyceride-rich endogenous complex of lipid and protein for transport in the blood.

VILLI: finger-like projections from the folds of the small intestine.

VITAMER: one of multiple forms of a vitamin.

VITAMIN: organic substances found in food in minute quantities which are essential for normal growth and metabolism, and that cannot be synthesized by the body.

WATER-SOLUBLE VITAMINS: vitamin C and the B-complex vitamins; those which dissolve in water.

WHEY PROTEINS: the proteins remaining in the watery fraction of milk after the curd and cream have been removed.

WHITE ADIPOSE TISSUE: repository for triglyceride; a cushion to protect body organs and an insulator to preserve body heat.

WHOLE GRAIN: a grain that retains much of the material of its outside layers, except the chaff.

YO-YO EFFECT: the process of losing and gaining weight several times throughout a lifetime; characterized by a greater fatness after each cycle.

XERODERMA: a dry, rough, discolored state of the skin, with the formation of a scaly desquamation.

XEROPHTHALMIA: in the eye, the collective symptoms of vitamin A deficiency.

XEROSIS: abnormal dryness of the skin, mucous membranes, or conjunctiva.

XYLITOL: a noncariogenic (doesn't cause tooth decay) sugar alcohol absorbed one fifth as fast as glucose, and often used in sugarless chewing gum.

About the Author

John Pillepich has been interested in health and nutrition for more than thirty years. His formal education includes a doctorate in Holistic Nutrition from the Clayton College of Natural Health, a master's degree in Nutritional Sciences from the University of Washington, and a bachelor's degree in Health Science from the State University College of New York at Brockport. He is also a Certified Pharmacy Technician.

His work experience includes working in clinical chemistry at The Genesee Hospital (Rochester, NY), health food retailing, Director of Research and Technical Education at a major nutritional supplement company, Director of Product Development at the Carl C. Pfeiffer Institute (Princeton Bio Center), and nutritional consulting.

Besides this current publication, he wrote *Nutrition Discovery*, a personalized nutrition education program that combines a person's computerized diet analysis with a comprehensive nutrition education and reference manual. He also coauthored, with Robert Ronzio, Ph.D., *Metabolic Mastery*, an educational product for learning human intermediary metabolism (biochemistry).

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